

Lexical competence in interactive teaching of Russian as a foreign language

Competencia léxica en la enseñanza interactiva del ruso como lengua extranjera

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ABSTRACT:

The paper studies the issues of textual mechanism of teaching Russian as a foreign language to students. The authors believe that the main idea of the study is that students' preparation is often still carried out only by techniques of the traditional type as the basic unit of success of training is a quantitative measure of learned grammatical rules and vocabulary volume. In the study, the authors determined that the innovative point is to obtain a satisfactory level of competence formation on the basis of mastering the skills required to understand the scientific text and the ability to actively and grammatically correctly operate the necessary set of lexical units of the scientific style of speech. In General, the work is of an applied nature, and the authors suggest the need to take into account in the course of teaching Russian as a foreign professional sphere of the future specialist.

Keywords: Educational texts, scientific style of speech, tests, interactive learning, discussion, Russian language, foreign language, student learning

RESUMEN:

El documento estudia los problemas del mecanismo textual de enseñanza del ruso como lengua extranjera. Los autores creen que la idea principal del estudio es que la preparación de los estudiantes a menudo solo se lleva a cabo mediante técnicas del tipo tradicional, ya que la unidad básica de éxito del entrenamiento es una medida cuantitativa de las reglas gramaticales aprendidas y el volumen del vocabulario. En el estudio, los autores determinaron que el punto innovador es obtener un nivel satisfactorio de formación de competencias sobre la base de dominar las habilidades requeridas para comprender el texto científico y la capacidad de operar activa y gramaticalmente correctamente el conjunto necesario de unidades léxicas de la estilo científico del habla. En general, el trabajo es de naturaleza aplicada, y los autores sugieren la necesidad de tener en cuenta en el curso de la enseñanza de Rusia como una esfera profesional extranjera del futuro especialista.

Palabras clave: textos educativos, estilo científico del habla, pruebas, aprendizaje interactivo, discusión, idioma ruso, idioma extranjero, aprendizaje de los estudiantes

1. Introduction

Summarizing the types of tasks and organizational forms and means of interactive learning, we can assume that all of them can and should be used creatively in the process of forming lexical competence (Włosowicz, 2016). Qualitative properties of interactive learning should be extrapolated to the educational practice of students to expand the range of professional vocabulary, training its use in professionally oriented communication (Twyford, 1956). A positive result of educational activity on mastering special, in particular, scientific, vocabulary can be achieved in the process of collective decision of discussion issues, during the construction of structural and logical schemes for expressing one's own judgments using adequate words, as well as in the process of situational modeling, which is accompanied by constant practice in the use of the studied lexical units (Sadikoglu, 2017). Despite the nature of the game, interactive training with vocabulary forms the intellectual skills necessary for future professionals and can be conducted using computer information technologies (Skweres, 2016).

Based on the results of modern scientific and pedagogical research on the problems of didactics, psychology and methods of teaching a foreign language and taking into account the analysis of the problem, it seems advisable to harmoniously combine or situationally vary the various organizational forms of interactive learning as an effective means for students to learn lexical material (Dolzhikova, 2017). The variety of forms of educational speech interaction best contributes to the assimilation of vocabulary and stimulates its use in oral and written speech in solving professionally significant problems for students, taking into account the specific situation or learning conditions (Olfert, 2018). Taking into account the above, we believe that the use of pair-group and collective forms of work on the study of foreign language lexical material in the teacher-managed and independent work of students is the basis of the method of interactive formation of lexical competence (Kalaja, 2015; Hasanov, 2016a; Hasanov, 2016b; Eugstera & Hasanov, 2016).

To implement this technique in the practice of learning necessary prerequisites (Wilson, 2014). The study of scientific and pedagogical literature and the analysis of the state of teaching disciplines of the Humanities cycle allow us to believe that socio-economic and didactic prerequisites for the introduction of methods of formation of lexical competence by means of interactive learning are (Chapelle, 2016):

- modern processes of restructuring and transformation of the national education system on the principles of humanization and democratization of the educational process;
- the processes of adaptation of national educational standards to international standards in connection with the country's entry into the European and world educational space;
- rapid development of computer and telecommunication technologies in the field of education;
- promotion of alternative forms of organization of educational process in higher education;
- the formation of the student team and the development of senior students organizational and analytical skills necessary for the implementation of interactive learning;
- the presence of students interest and motivation to the study of professionally oriented foreign language with the aim of achieving high competitiveness in the labour market.

We consider it expedient to formulate the following conceptual provisions that characterize and define the proposed methodology for the interactive formation of lexical competence.

2. Literature review

The condition for students to obtain a quality educational product as a result of professionally oriented study of Russian as a foreign language is their mastery of industry terminology, in conjunction with the acquired knowledge in core disciplines is the intellectual development of a person capable of self-realization and fully functioning in a foreign-speaking business environment (Mildenberger, 1962).

Means of formation of lexical competence within the framework of studying professionally-oriented Russian as a foreign language are adequate to modern requirements and effective pair-group and collective organizational forms of speech interaction, which provide students not only the acquisition of knowledge of professional vocabulary, but also create

opportunities for the development and consolidation of skills of full use of the acquired lexical material in foreign language communication in the field of their future professional activity (Kazakevitch, 1996).

Teaching students Russian terminology through their active interaction in groups and teams which take part in the game design, the collective decision of problem tasks creates favorable prerequisites for enhancing creative thinking of students and develop their abilities, reveals a potential communicative and professional opportunities, encourages flexibility and pragmatism in the process of perception and processing in the Russian language information in the specialty, provides ample opportunities for integrating the knowledge of students from different disciplines (Bauer, 1960).

Interactive formation of lexical competence of senior students involves them in the process of planning, organizing and conducting collective forms of Russian-speaking speech interaction and joint evaluation of the results, which allows to realize the educational goal of training, to form future specialists as leaders of the team, which have a sense of responsibility in decision-making and objectivity in assessing their performance Raugh, 1977).

Pair-group and collective forms of education should be combined with an individual approach to each student to provide comfortable psychological and pedagogical conditions for the organization and conduct of the educational process of interactive formation of lexical competence, to stimulate the desire for self-knowledge, which is an urgent task in the context of continuous foreign language training (Collings, 2007).

Interactive training for the purpose of formation of lexical competence in the study of professionally-oriented Russian as a foreign language is aimed at replacing the authoritarian-disciplinary model of training with a personality-oriented one, which in the context of democratization and humanization of the educational process provides for the modification of the administrative functions of the teacher, flexible and variable use of methods of psychological and pedagogical influence on students (phϕm, 2014).

Conceptual understanding of the problem of interactive formation of Russian-language lexical competence is aimed at intensifying the educational process and ensuring the high quality of educational and qualification training of students in Russian as a foreign language in the professional areas of humanitarian and social disciplines (Schmadel, 2012). The use of interactive learning tools creates favorable conditions for the maximum development of creative initiative of students, forms their desire for self-study, increases interest in the integrated study of special political disciplines and the development of professionally-oriented Russian as a foreign language (Schmadel, 2012). In the context of interactive learning, the Central figure and subject of the educational process is the student, who has the opportunity to actively interact with the teacher and other students as speech partners to acquire knowledge of terminological vocabulary and form the ability to use it during communication in order to solve professional problems (Policy and Teaching French as a Second Foreign Language, 2002). This concept of the formation of lexical competence corresponds to the latest approaches to the organization of professionally oriented training and should provide students with an increase in their communicative competence (Arkhipova, 2018).

It is necessary to pass to consideration and justification of didactic basis for interactive formation of lexical competence. Such a basis we consider a set of General and special methodological principles that reflect the basic laws of the educational process, define common approaches to the organization of training, affect the content of educational and methodological materials that provide ways to achieve the goal of learning Russian as a foreign language (Arkhipova, 2018). Of the research in didactics of the General principles of learning relevant and effective for providing interactive learning of vocabulary consider the principles of visibility, awareness, activism and interdisciplinary coordination. Important methodological principles that should be followed with the purpose of the interactive formation of lexical competence are the principles of communicative, interrelated learning all kinds of foreign language speech activity and professional orientation of education (dos Santos, 2009). Compliance with these principles, which are based on the basic principle of

didactics – learning in activity, is considered an important prerequisite for the implementation of interactivity in the learning process (Sysa, 2018). Further interpretation of the principles selected by us is aimed at ensuring the process of interactive formation of lexical competence. Let us analyze their effect from the point of view of our research in more detail.

3. Materials and methods

First of all, we analyze the results of the preliminary experiment, the purpose of which was to test the developed set of exercises and find out how the proposed model of training provides the process of formation of lexical competence, and if necessary – to make adjustments. At the first stage, we conducted a section of the initial level of knowledge by students of terminological vocabulary and the level of ability to use it in oral and written speech, for which students performed a diagnostic test section. This section also served as a feedback function, in order to identify the degree of compliance of the chosen strategy and tactics of training to the real needs of students. Thus, the diagnostics of students' knowledge of terminological vocabulary and the ability to use it in written and oral speech, which was the object of control, as well as the diagnosis of the needs of students in the study of selected professional vocabulary as a condition of mastering professionally directed Russian as a foreign language.

We prepared a test to control the level of knowledge of students of professional vocabulary consisted of twenty test tasks (multiple and alternative choice, substitution of terminology vocabulary and the like). To determine the score within the accepted 100-point scale, each correct answer was multiplied by 4. The maximum number of points per test – 100.

The results of the tests performed by the students showed that the level of knowledge of vocabulary students EG1 after studying the educational material of the content module was an average of 85.45 points. Accordingly, the level of vocabulary knowledge test results of students EG2 were, on average, 82,85 points; EG3 – 74,95; EG4 – 75,35. Qualitative analysis performed unit tests showed that, despite some mistakes in the identification of terms and their understanding, students mainly achieved its objectives and reached a satisfactory level of training as the average score for the test to check the level of knowledge of terminology in all EG has to 79.65 points.

The second stage of the experiment was to check the level of ability to use terminology in writing. To this end, the students performed tasks for drawing up their own written messages. The tasks were performed in the form of essays, abstracts and individual educational and research projects that students performed independently. It was widely practiced to provide students with advice and methodological assistance in writing abstracts and reports during individual lessons in extracurricular time under the guidance of the teacher.

To check written assignments, edit them, improve the content and/or graphic design, students were recommended to exchange works with each other, then make the necessary adjustments and pass the test to the teacher. Using certain criteria for evaluation, the teacher put the assessment (up to 25 points for each criterion) and displayed the final score, which did not exceed 100. The results of the control of skills to use terminological vocabulary (in written works) in the context of experimental groups were as follows: EG1 – on average-78.9 points; EG2 respectively 86,5; EG3 – 78,65; EG4 is 80.8. The total indicator of the level of assimilation of the material, which was obtained as a result of the addition of averages and dividing them by the number of groups, was 81.21 points, which is considered satisfactory. Qualitative analysis of written tasks revealed the ability of students to use vocabulary in accordance with the context, logically combine and transform it. The average amount written was respectively set task 3-5 pages typed on a computer text. However, the grammatical and stylistic correctness of writing and the use of terms to Express thoughts in a foreign language required further improvement.

In the third stage, to test the level of students' ability to use terminology in speech, they were tasked to build their own statements with a new vocabulary. To do this, students were offered situations in which they demonstrated not only the ability to use terminology, but

also the ability to use it in the communicative sphere: in the discussion, in the reasoning of their point of view, in the construction of models of persuasion, doubt, disagreement, etc., and also showed their level of intellectual activity.

Students' responses were recorded on the server and evaluated according to previously defined criteria. The maximum number of points per criterion 20; just test – 100 points. The results of the control of the level of skills of students to use vocabulary in oral statements were as follows: EG1 – average of 79.65 points; EG2 respectively 87,45; EG3 – FOR 84.4; EG4 – 87,65. The total indicator of the level of mastering the skills and abilities to use lexically units of the scientific style of speech in all groups, which we received as a result of adding up the average values and dividing them by the number of groups, was 84.78 points and is satisfactory.

4. Results and discussions

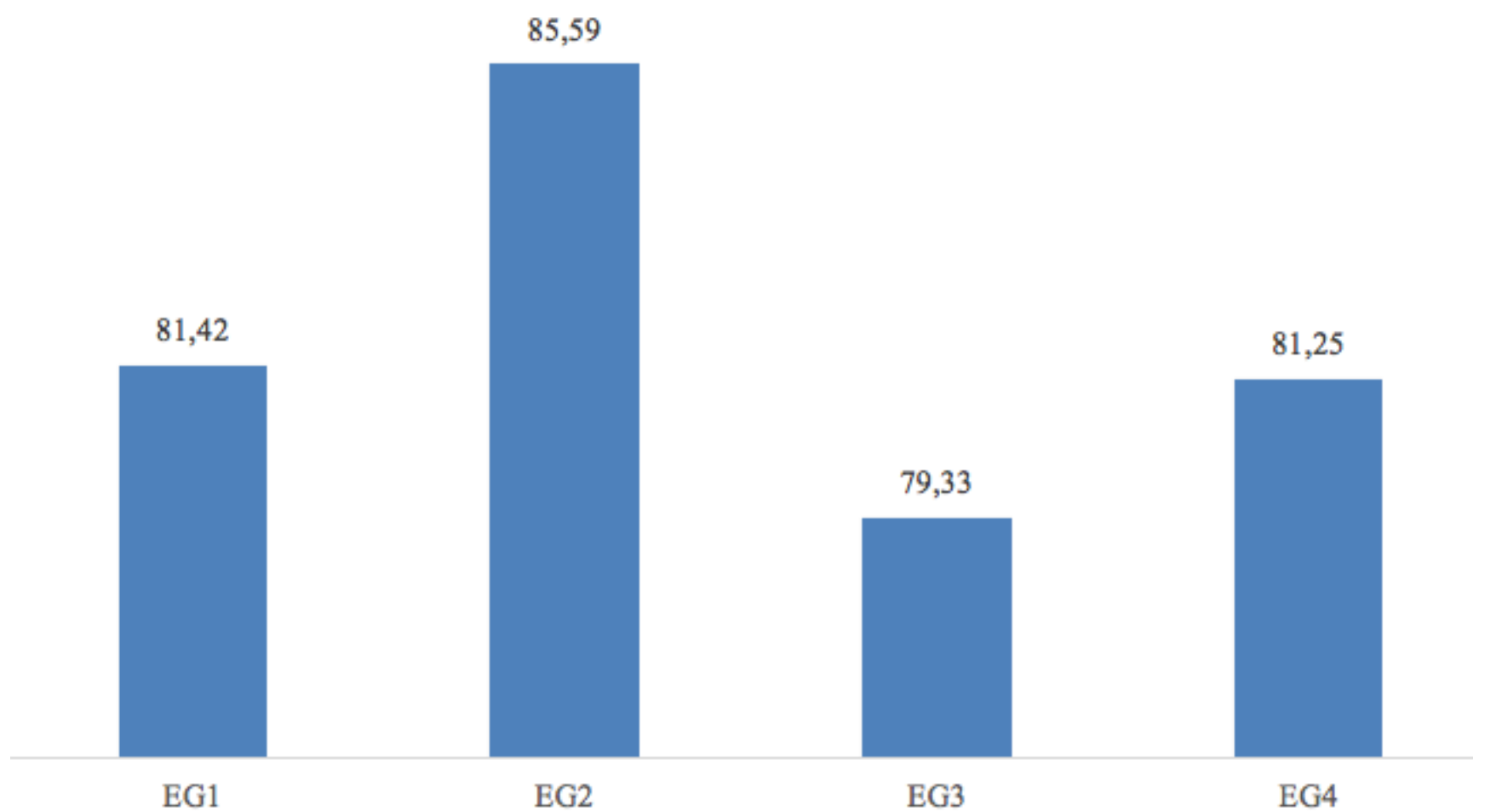
Qualitative analysis of oral messages of students, their statements in the process of interactive exercises in the form of discussions and role/business games showed that students have formed the ability to adequately use the lexical units in accordance with the situation, they have sufficient to Express the opinion of the volume of necessary terms, the use of terms in the speech is marked by relative correctness. It should be noted that when evaluating speech skills, we focused not on the absolute, but on the relative correctness of speech, so the assessment of the achieved level of competence in speaking was influenced not by the number of language errors, and the degree of solution of the communicative problem. In addition to a fairly well-formed ability to use vocabulary in speech, students during the implementation of interactive forms of work there was an activation of their thinking, there was a formation of skills of active listening and adequate behavior and response in difficult situations.

Thus, by means of tests it was possible to carry out control and to reveal the level of formation of lexical competence by results of training of students during preliminary experiment. To obtain the final results, which show the achieved level of lexical competence formation, we summarized the average results of the tests and divided the sum by the number of tests. The total indicator of the level of formation of lexical competence in all EG (Fig. 1) after the preliminary experiment was 81,89 points. So, according to the results of the preliminary experiment, we can state that the students showed a sufficient level of knowledge of terminology vocabulary and the ability to use it, which was due to the use in experimental training developed by the author of a set of exercises and interactive tasks.

The results of the level of formation of lexical competence of EG students (after a preliminary experiment).

Figure 1

Average academic performance in the context of groups, in points



The observations carried out during the experiment revealed an increase in students' interest in teaching professional vocabulary, because the implementation of exercises in practical classes and in the process of individual and independent work with the use of interactive forms of learning, such as role-playing and business games, discussions based on read texts, presentations of prepared abstracts or reports turned ordinary classroom classes into non-standard, unusual and effective classes-conferences. In General, it positively influenced the quality of mastering the terminological vocabulary and the General level of formation of students of Russian-language lexical competence.

In the process of reconnaissance experiment correction of the developed model of vocabulary teaching was carried out, instructions to performance of some exercises were improved. For example, it was necessary to reorient interactive forms and methods of working with vocabulary in exercises to all stages of the formation of lexical competence, using the potential of individual and independent work of students. It was decided to make adjustments to some exercises to give them a communicative direction. It was also inappropriate to write abstracts using a computer, because some works were not prepared independently. This called into question the results of the control of the level of skills to use terminological vocabulary in writing.

The task of the preliminary experiment was also to monitor the educational process and to find out the opinions of EG students regarding the impact of the developed set of exercises on the expansion of their background knowledge, improving the efficiency of learning Russian as a foreign language in a professional direction. To this end, after the end of the reconnaissance experiment, we conducted a survey of all its participants (57 people) and analyzed the respondents' answers. The analysis of these answers showed that as a result of application of a complex of exercises for teaching terminology vocabulary at students of EG considerably improved (10,5% of respondents) and in General knowledge of terminological vocabulary improved (43,8% of respondents), and also factual knowledge on economic disciplines enriched. On the other hand, it should be noted that 5.2% of the surveyed students did not improve their knowledge of terminological vocabulary when performing the developed exercises. This can be explained by the omissions of some students or insufficient attention to the quality of their education.

Texts and tasks offered to students in the exercises were quite informative, informative and interesting. As evidenced by the analyzed answers of students available in exercises tables, charts, diagrams, etc. stimulated oral speech, increased the argumentation of messages, contributed to the visualization of the educational process. A large number of exercises of a

playing nature made in the process of teaching vocabulary elements of personal orientation and emotionality and motivated students to communicate in a foreign language. The majority of the developed exercises and tasks appeared feasible for performance, adequate for formation and improvement of lexical knowledge and abilities. Therefore, the conclusion received as a result of poll of students consists that the developed exercises it is expedient to use in educational process on Russian as foreign language.

A preliminary experiment has established the preconditions to conduct a baseline experiment, the need for which was caused by a number of factors, both objective and subjective. In this regard, in order to confirm the proposed hypothesis of the experiment and obtain reliable results about the effectiveness of the complex of exercises developed by us as the basis for the method of formation of lexical competence by means of interactive learning, we organized preparatory work and conducted a basic experiment in accordance with the methodological requirements and recommendations. We will focus on the analysis of the results of preexperimental, postexperimental and delayed sections to monitor the level of formation of lexical competence of students EG1 and EG2 read more.

The objects of control, as already noted, were students' knowledge of vocabulary and the ability to use it, which is the structure of lexical competence.

In order to determine the initial level of knowledge of professional vocabulary students EG1 and EG2 we conducted a test, which consisted of 50 problems of alternative and multiple choice. The development of such a test was due to the fact that it meets the main indicators of quality, that is, validity, reliability, discriminatory ability, practicality and cost-effectiveness. The test was conducted simultaneously in two formed EG.

Testing of this test was carried out with keys, and the assessment was derived on the basis of the formula developed in the theory of testing. In this case, each correct answer was evaluated in two points, and then put the total score within the scale of the hundred-point evaluation, which is described above. The test results showed that the initial level of knowledge of terminological vocabulary in students EG1 was 63.8 points, and in EG2 – 69.8 points, which is below the sufficient level of learning. Qualitative analysis of the test revealed low and insufficient knowledge of professional vocabulary students. In particular, students experienced difficulties in the recognition and differentiation of terminological units, was careless in his choice of a better term, can apply analytical skills and background knowledge in the Humanities. Only some students demonstrated a sufficient level of education. In General, the low test results revealed the need for students to perform special exercises and tasks to master Russian scientific terminology.

To control the initial level of students' ability to use terminological vocabulary in written speech, a test was developed, which, with the help of test tasks for transformation, compression, extension of the terms of preparation, revealed their ability to transform, produce and use terms at the level of words, phrases and sentences. The advantage of this test is that students must not only choose the correct word from the options and edit or create a term to make your own way to complete a certain wording or to answer questions, demonstrating their ability to use terminological vocabulary within a given context and freely use the terms in writing.

Taking into account the limited number of academic hours, this test was conducted on the same practical lesson as the test of vocabulary knowledge, that is, the duration of the two tests was 2 academic hours. The test was tested with keys (tasks 1-3), and specially designed criteria were used to evaluate the answers with freely designed answers (tasks 4-5). Because the jobs producing their own written text in comparison with the selection or the transformation of the word is considered to be more difficult, for each correct answer in tasks 1 to 5 was charged at 2 points (only could get up to 50 points), each right appropriate above criteria the response when performing the fourth job was estimated at 3 points (up to 30 points) and fifth – 4 points (up to 20 points). The maximum number of points per test – 100.

The test results are as follows: EG1 – of 64.0 points, EG2 – 62.6 points, which is inadequate ratio of training. The analysis of the written responses of the students suggests that the students used a narrow range of terminological units, lacks the ability to logically combine

the terms training and build terms, phrases or sentences, and lack the ability to transform the lexical units and to correlate them with Russian derivational models of grammar. Students' answers to questions do not quite correspond to the language norm, there is an inadequate choice of the necessary terminology units for expressing thoughts and achieving the goal of communication. Thus, the written tests revealed the lack of competence of almost all students of EG, which was due, in our opinion, a long break (summer vacation) in the study of Russian as a foreign language.

Control of the level of students' ability to use terminological vocabulary in oral speech took place with the help, as noted above, the developed test apparatus, the formulation of tasks that require students' skills of free and adequate response in a test situation in the design of statements with the vocabulary studied.

The responses of the test subjects were evaluated using previously defined criteria and the scores were entered by the teacher in the evaluation sheets prepared in advance. For compliance statements to each criterion exhibited up to 20 points, the maximum number of points for oral response of each student-100. The results of controlling use of unnecessary jargon in speech such: EG1 – 66.5 points, EG2 – 65.9 points. Analysis of the oral answers of the students showed lack of ability to use professional language on the level of the coherent text, the inconsistency of their statements of the situation, the low level of skills for adequate selection of the necessary terminological units, its logical combination with others to create more complex statements. The results of the oral test showed that the level of skills of the majority of EG students did not meet a sufficient coefficient of learning.

Thus, with the help of tests it was possible to control and identify the level of knowledge and skills of students at the beginning of the basic experiment. The average results preexperiment slice in each of the EG (tab. 1), for which we summed up the results achieved by students for the tests described above and divided the amount by the number of test takers, reflect the initial level of formation of lexical competence.

Table 1
Results of monitoring the level of lexical competence formation in EG students (preexperimental section)

The index groups	Knowledge of professional vocabulary	The ability to use professional vocabulary in		Average score
		written speech	oral speech	
EG1	63,8	64,0	66,5	64,76
EG2	69,8	62,6	65,9	66,08

As it follows from the table above, the results of the cut needed to be carried out pilot training. Since the EG1 group showed a low level of lexical competence formation at the beginning of the basic experiment, in accordance with the known in the theory of the experiment principle of "opposing side strengthening" this group was chosen for experimental training on the basis of the developed set of exercises.

After the pilot study, which lasted three weeks, was held post cut. To control the level of formation of lexical competence students performed tests similar to those offered them before the start of experimental training. That is, students performed tests to control the level of knowledge of the scientific terminology of the Russian language and the ability to use it in oral and written speech. The only difference between the new tests was their lexical content. The procedure for conducting tests and their verification was identical to the previous one. The results of the control (table. 2) found the increased indicators of progress of students.

We briefly analyze the qualitative indicators of tests performed by students to monitor the

level of knowledge of vocabulary. The results indicate a fairly high level of knowledge of the selected vocabulary, the formation of the ability to select words in accordance with the context or interpretation.

Table 2
Results of the control of the level of formation of lexical competence of the students of the EG (post cut)

The index groups	Knowledge of professional vocabulary	The ability to use professional vocabulary in		Average score
		written speech	oral speech	
EG1	84,5	83,75	81,4	83,21
EG2	81,9	74,95	78,9	78,58

However, the results of the group EG1, which studied using the author's complex of exercises and tasks, showed a much higher level of formation of lexical competence. Qualitative analysis of the conducted test to control the level of skills to use Russian scientific vocabulary in writing showed that the students have mastered the ability to transform the lexical units, to choose the appropriate time for the completion of statements or formulation of their thoughts when answering questions. Control of the level of skills to use scientific vocabulary found their formed ability to adequately plan to use the necessary lexical units in speech, it is logical to combine words. The rate of speech of students and the saturation of professional vocabulary in the statements are quite high, but the grammatical and phonological correctness of the words requires further study. So, we analyzed the results of the conducted postexperimental slice, on the basis of which we can assume that the exercises, which studied students EG1, are quite effective and adequate for use in the educational process.

For control of durability of knowledge of vocabulary, stability of lexical skills and level of formation of lexical speech abilities in three weeks after experimental training the delayed cut was carried out. The students in EG performed tests of the identical post. The results of the delayed slicer (tab. 3) indicate that the students have reached a sufficiently high level of competence. However, this time) students of EG1 group, who studied on the basis of our set of exercises, showed a higher level of formation of Russian lexical competence in comparison with students of EG2.

Qualitative analysis of the tests performed by students to test the level of knowledge proved the presence and stability of knowledge of professional vocabulary of students, although the number of stored in the memory of lexical units clearly decreased, due to objective psychological processes of forgetting.

Table 3
Results of monitoring the level of formation of lexical competence of EG students (delayed cut)

The index groups	Knowledge of professional vocabulary	The ability to use professional vocabulary in		Average score
		written speech	oral speech	
EG1	80	78,2	77,1	78,42
EG2	77,4	68,3	74,2	73,19

When performing the test to control the level of skills to use Russian scientific terminology in

written speech, the testers found the ability to transform and select terminological units, the ability to formulate their thoughts using the studied vocabulary. Students showed the ability to choose words according to the plan, it is logical to combine them and build connected frames according to the given situation. The speech rate of students has increased, although there are some difficulties in choosing the appropriate grammatical form of the word and its pronunciation. As a result, we come to the conclusion that the higher rates of the EG1 group are due to the interactive format of working with vocabulary in the implementation of the developed set of exercises for the formation of lexical competence.

Based on the results of the tests we present the average level of formation of lexical competence of students of EG (table. 4).

Table 4
Comparative table of average indicators of the level of formation
of lexical competence in students of EG, in points

The index of the group	Preexperimental cut	Post cut	Growth	Delayed slice	Growth
EG1	64,76	83,21	18,45	78,42	13,66
EG2	66,08	78,58	12,5	73,19	7Д1

As the table shows, the increase in knowledge after the experimental training, the students EG1 made up 18.45 points, and the students EG2 – 12.5 points. Three weeks after the end of the experimental training, students demonstrated a sufficient indicator of competence, and the increase in knowledge among students EG1 and EG2 compared with the preexperimental cut was 13.66 and 7.11 points respectively. In the first and second cases, students of the EG1 group, who studied during the experiment on the basis of the developed exercises and tasks with an emphasis on the interactive nature of speech interaction during their performance, demonstrated the highest level of knowledge of professional vocabulary and the ability to use it compared to EG2.

Therefore, the obtained results give us reason to believe that the complex of exercises developed by the author, which was carried out within the framework of the cyclic-thematic model of interactive learning, is an effective and adequate means for the formation of lexical competence of students. This confirms the hypothesis put forward by us at the beginning of the experiment.

To prove the validity and reliability of the results obtained during the experiment and to substantiate the findings, we used the statistical evaluation of the data, using the developed mathematical statistics single-factor variance analysis.

The essence of this analysis is to decompose the variation of the indicator according to the sources of formation. The number of sources of variation depends on the number of factors by which groups are formed. Two components of variation are distinguished in the one-factor variance analysis:

- intergroup due to the action of factor forms the basis of the group;
- intra-group, random variation.

The main identity of the one-factor variance analysis is presented as the relationship between the sums of the squared deviations:

$$Q_{initial} = Q_{factorial} + Q_{random}$$

where – sum of squares of deviations of individual observations from the total mean, – сумма квадратов отклонений отдельных наблюдений от общего среднего, – sum of squares of deviations of individual observations within groups from group averages. On the basis of the sum of squares of deviations of the calculated three estimates of the variance by sources of variation, namely:

total variance

$$D_{initial} = \frac{Q_{initial}}{n - 1}$$

inter-group or factorial variance

$$D_{factorial} = \frac{Q_{factorial}}{m - 1}$$

intra-group, variance of random factors

$$D_{random} = \frac{Q_{random}}{n - m}$$

Denominators of variance estimates represent the degrees of freedom of the corresponding sources of variation. The ratio of inter-group and intra-group variations (based on one degree of freedom) allows you to check the basic, or zero, statistical hypothesis. The ratio of the number of degrees of freedom () и (), where m is the number of groups and n is the number of observations that determines the critical Fisher f test value for significance level . This implies the basic principle of mathematical verification of the statistical hypothesis: if – the null hypothesis is rejected; otherwise, if , there is no reason to reject the null hypothesis.

For the organization of one-factor variance analysis it is necessary to measure the value of some dependent variable-response at two levels of qualitative factor, which are interactive vocabulary learning tools in the developed set of exercises. Taking this into account, we conducted three sections of the level of formation of lexical competence. The first (preexperimental) section showed the level of formation of lexical competence of students at the beginning of the basic experiment. The second (post) the cut revealed the level of formation of lexical competence of the students, which they reached after the pilot study. The third (delayed) section allowed to establish the level of lexical competence formation in EG students in three weeks after the end of experimental training.

The results of the experiment were processed using the statistical data processing package in the Microsoft Excel operating system. First of all, we compared the results of preexperimental and postexperimental sections of the level of formation of Russian-language lexical competence of students of both EG (table. 5 and 6). Let us briefly comment on the results of statistical and mathematical processing of these results.

Table 5
Single-Factor variance analysis EG-1

Single-factor dispersion analysis EG-1						
Overall results						
Groups	Account	Amount	Medium	Dispersion		
Line 1	20	1295,25	64,7625	27,01585132		
Line 2	20	1664,26	83,213	24,09963263		
Analysis of variance						
Source of variation	SS	df	MS	F	P- value	F critical
Between groups	3404,21	1	3404,21	133,1968022	5,49688E-14	4,098171661

Within the group	971,1942	38	25,55774			
Summarily	4375,404	39				

Table 5 presents the characteristics of the groups: frequency, total and average values, variance. Group averages indicate that when teaching students of group EG 1 on the basis of the developed complex of exercises the level of formation of lexical competence increases in comparison with the level reached by students of group EG2 as a result of performance of exercises with similar lexical filling, but without use of interactive means of training, from 64,76 to 83,21 points.

In the column "Dispersion analysis" (table. 5) the sources of variation, variance estimates – intergroup ($3404.21:1=3404.21$), intra-group ($971,1942:38=25,55774$). The sample value of Fisher's criterion $F = 133,196$ far exceeds the critical $F_{1-p}(f_1, f_2) = F_{1-0,05}(2, 17) = 4,098$, which gives us reason to reject the null statistical hypothesis and consider the differences of group averages not random. If we reject the null hypothesis ($H_0: \mu_x = \mu_y$), it means that the difference between the mean samples is significant and is explained by the fact that the mean μ_x and μ_y are different. In our case, the values of μ_x and mean a variety of qualitative factors (the use of interactive tools for teaching vocabulary students EG1 and perform similar exercises manual on the Russian language, but without the special use of interactive means of teaching vocabulary in EG2. Therefore, taking an alternative, or competing hypothesis ($H_0 / \mu_x \neq \mu_y$), with a probability of 0.95, it can be argued that the use of interactive tools in the implementation of the developed set of exercises in the teaching of Russian-language vocabulary significantly influenced the improvement of the qualitative indicator of the level of formation of language competence of students of the group EG1.

Table 6 presents similar results of the analysis of the level of formation of Russian-language lexical competence on the basis of comparison of preexperimental and postexperimental sections of students of EG2 group.

Table 6
Univariate analysis of variance EG2

Single-factor dispersion analysis EG-2						
Overall results						
Groups	Account	Amount	Medium	Dispersion		
Line 1	20	1321,92	66,096	106,56144		
Line 2	20	1571,6	78,58	42,764042		
Analysis of variance						
Source of variation	SS	df	MS	F	P- value	F critical
Between groups	1558,503	1	1558,50256	20,8739	5.05502E-05	4,098171661
Within the group	2837,184	38	74,6627389			
Summarily	4395,687	39				

Group averages (66,096—78,58). The change in group averages EG2 compared to EG1 is

less tangible. This is explained by the fact that the students of this group studied without systematic use of interactive modes of working with vocabulary in the course of exercises and tasks from the chosen for the experiment textbook. The between-group variance

$$\frac{SS}{df} = \frac{1558,503}{1} = 1558,503$$

the variance intra-group

$$\frac{SS}{df} = \frac{2837,184}{38} = 74,66273895$$

In tables 7 and 8 presents the results of analysis of variance based on the comparison of data preexperiments and deferred sections of students groups EG1 and EG2.

Table 7
Single-Factor disperse analysis EG-1 (A)

Single-factor dispersion analysis EG-2						
Overall results						
Groups	Account	Amount	Medium	Dispersion		
Line 1	20	1295,25	64,7625	27,015851		
Line 2	20	1568,58	78,429	33,538462		
Analysis of variance						
Source of variation	SS	df	MS	F	P- value	F critical
Between groups	1867,732	1	1867,732	61,687834	1,7727E-09	4,098171661
Within the group	1150,532	38	30,27716			
Summarily	3018,264	39				

Group averages (64,7625—78,429). Three weeks after the end of the experiment, the difference of group averages is noticeable, which indicates a fairly stable level of lexical knowledge and a proper level of formation of Russian-language lexical competence in foreign students EG1, who worked during the experimental training using interactive means in the performance of exercises from the developed complex. Dispersion of intergroup

$$\frac{SS}{df} = \frac{1867,732}{1} = 1867,732$$

the variance intra-group

$$\frac{SS}{df} = \frac{1150,532}{38} = 30,27716$$

Table 8
Single-factor analysis of variance EG2 (A)

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Single-factor dispersion analysis EG-2 (A)

OVERALL RESULTS						
Goupy.	Account	Amount	Medium	Dispersion		
Line 1	20	1321,92	66,096	106,5614358		
Line 2	20	1469,81	73,4905	62,37475237		
Analysis of variance						
Source of variation	SS	df	MS	F	P- value	F critical
Between groups	546,7863	1	546,7863	6,473288032	0,015137437	4,098171661
Within the group	3209,788	38	84,46809			
Summarily	3756,574	39				

Group averages (66,096-73,4905). The change in group averages shows a sufficient level of formation of lexical competence in students EG2 three weeks after the completion of experimental training, but these figures are lower compared to the group EG1. It is quite obvious that the high results in the EG1 group are due to the positive potential of interactive tools that were used to teach Russian vocabulary on the topic of "international relations and politics" during the students' exercise developed complex. The between-group variance

$$\frac{SS}{df} = \frac{546,7863}{1} = 546,7863$$

the variance intra-group

$$\frac{SS}{df} = \frac{3209,788}{38} = 84,46809$$

We analyze the resulting variance (table. 9). The difference between inter-group and intra-group dispersions in EG1 is significant, which indicates the positive impact of the interactive format of work with Russian political terminology on the level of formation of lexical competence. In the group EG2, students of which were trained in the possession of professional vocabulary without systemic use of interactive tools, indicators of between-group variance is much lower. Intra-group dispersion in EG2 exceeds the corresponding figures in EG1, which indicates a significant impact of random factors on the quality of formation of Russian lexical competence of students EG2.

Table 9

Indicators of the dispersions according to the results of a methodological experiment

Group	Slices	The between-group variance (factor variation)	Vnutriportovaya variance (random variation)
EG1	Preexperimental and postexperimental	3404,21	25,55774
EG2		1558,50256	74,66273895

EG1	Preexperimental and delayed	1867,732	30,27716
EG2		546,7863	84,46809

So, based on the results of data processing of methodical experiment, we come to the following conclusion: in the process of experimental training confirmed the hypothesis that the author developed a set of exercises for interactive teaching of Russian vocabulary is quite effective and it can be recommended for use in teaching students to form their lexical competence in the production of texts of the scientific style of speech.

5. Conclusion

The main scientific result of the article is the description and interpretation of the results of the methodical experiment, the purpose of which was to test the effectiveness of the developed set of exercises for interactive teaching of students of professional vocabulary in the framework of the proposed scientifically based cyclic-thematic model of the educational process. The article analyzes the progress and results of the pilot study.

The results of the sections during the preliminary experiment, which aimed to test the developed complex of exercises and Refine the chosen model of vocabulary learning, failed to achieve a sufficient level of formation of lexical competence of the students, namely: EG1 – 81,42 points; EG2 – 85,59; EG3 – 79,33; EG4 – a total of 81.25. The average indicator of the level of formation of lexical competence of students of all EG, who studied on the basis of a set of exercises, was 81.89 points.

The purpose of the basic experiment was to test the effectiveness of a set of exercises within the corrected training model. For this purpose, two EGS were formed consisting of twenty students each. Preexperiments slice showed that the students in both the EG were approximately equally low knowledge of vocabulary and ability to use in writing and speaking: EG1 – 64,76 points; EG2 – 66,08 score that has resulted in the need for experiential learning. EG1 studied on the basis of the developed complex of exercises, and EG2 – based on the exercises of these textbooks, however, without special use of interactive means of learning the professional vocabulary.

The results of the pilot study was conducted post the slice that showed the following level of development of lexical competence: EG1 – 83,21 points; EG2 – 78,58 points. The same situation was observed and after the implementation of the delayed slicer: EG1 – 78,45 points; EG2 – 73,19. The increase of the training after the experimental group learning EG1 made up 18.45 points, and in group EG2 is 12.5. Accordingly, the results of delayed cutoff of the growth of training amounted to 13.66 points in the group EG1 and 7.11 points in the group EG2. The obtained results allow us to conclude that the students of EG1, who studied on the basis of the developed set of exercises, showed a high level of formation of lexical competence, so the technique can be considered effective and adequate to the purposes of teaching Russian vocabulary in the specialty of international relations, management, political science. The results of the experimental training were tested and proved by the methods of mathematical statistics.

So, as a result of experimental training, it was possible to confirm the effectiveness of the complex of exercises developed by the author and prove the hypothesis of the experiment. The practical significance of the obtained results lies in the fact that a set of exercises was developed and experimentally tested, which found its implementation in the development of a set of exercises and tasks for THUIS. Also, we have formulated guidelines that can be used by teachers in the interactive practice of teaching students the professional vocabulary in Russian as a foreign language.

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