THE DEVELOPMENT OF FOREIGN LANGUAGE COMMUNICATIVE COMPETENCE OF STUDENTS AT THE NON-LINGUISTIC UNIVERSITY BASED ON COGNITIVE-SYSTEMATIZING APPROACH

INTRODUCTION
Optimization of modern national education and its integration into international socio-economic space provide grounds as for predicting new targets in innovative strategies of educational process as well for the content of education. The essence of these strategies is the search for alternative models of educational systems, the development of multicomponent and capacious methodological technologies of systematization and generalization, considered in the context of continuous effective development of the students’ intellectual and cognitive potential, including those in the paradigm of foreign-language professionally oriented education (BAGATEEVA, 2012; BOBYKINA, 2012; GALKSOVA, 2003; SHCHUKIN, 2004).

The efforts made to update the educational process can be effective only if there is a methodological basis that combines the achievements of modern pedagogical science (BARYSHNIKOV, 2014; CHÉLOÉ, 2017; DOBROVA, 2011). The main problem lies in the development of innovative technologies for teaching foreign languages, as well as in the intensification of methods to present educational material in order to increase mastering foreign language knowledge efficiency (KRYLOV, 2016).

In this regard, the methodology of teaching a foreign language for professionally oriented purposes should be improved through the optimization of traditional methods and forms of teaching and the widespread use of professionally adequate methods: graphical means of presenting information that model the structure of system knowledge, performing practical work that reveals its natural connections and dependencies, including an extensive system of effective didactic supports, semantic maps, training algorithms, problem situations, taking into account individual typological features, designed to implement in practice the cognitive-systematizing development of students’ communicative skills (BGANTSEVA, 2015; CHOROPOVA, 2013; KOCHETKOVA, 2010; UMEROVA, 2011).

The cognitive-systematizing development of students at non-linguistic universities requires the development of such learning models, the main feature of which should be general logical methods of cognition, their logically clear and methodically transparent linguistic explanatory potential, an attitude to meaningful perception and active assimilation of the system content typical of an educational subject, as well as their clear orientation to the formation of a real readiness to communicate (BGANTSEVA & TIKHAeva, 2015). It gives students the opportunity
to use the linguistic and cultural knowledge gained in the course of training in their future professional activities.

Cognitive-systematizing development is a development, aimed at activating the cognitive reserves of the speech-thinking functions that an individual has, stimulating cognitive personally significant practice-oriented activities in a foreign language, based on the predominance of system-generalizing technologies focused on the compression of the material for its meaningful and active assimilation in educational process (BGANTSEVA, 2015).

Based on the above provisions, we have developed basic principles and methodological provisions for the technology aimed at cognitive-systematizing development of students’ foreign language communicative competence at non-linguistic universities. On this basis, an experimental program of teaching a foreign language (German) to students studying at the University of physical education was prepared. It provided the purposeful step-by-step formation of cognitive communication strategies, the predominance of system-structural and generalizing methods use, focused on the compression of educational material for its meaningful and active assimilation (the methods of lexical and grammatical mapping, algorithmization of the most difficult phenomena to assimilate the sublanguage of the specialty, interactive classroom and extracurricular learning activities, and expanding syntagmas), taking into account individual typological features in systematic monitoring of communicative readiness level (BGANTSEVA et al., 2019(a); BGANTSEVA et al., 2019(b); UMEROVA, 2011).

The present study solves the problem of experimental testing of the technology aimed at cognitive-systematizing development of students’ foreign language communicative competence at non-linguistic universities and detecting its pedagogical productivity and effectiveness.

METHODOLOGY

To achieve the goal, a pedagogical experiment was organized and conducted for the period of 2019-2021 academic years. During the experiment, the technology of developing communicative readiness, implementing the concept of cognitive-systematizing development of foreign-language communicative competence was used in the educational process of an experimental group of students at Volgograd State Technical University, Faculty of Automated Systems, Transport and Weapons. To participate in the experiment, we invited 86 1st-year students, who were divided into control (40 people) and experimental (46 people) groups. The scheme of the pedagogical experiment is shown in Fig. 1.

Fig.1. General scheme of the pedagogical experiment on testing the technology aimed at cognitive-systematizing development of students’ foreign language communicative competence at non-linguistic universities and clarifying its effectiveness.

Source: Search data.
From the figure presented, it can be seen that the entire pedagogical process in the experimental group consisted of 7 stages.

The first stage included the entrance pedagogical testing and psychophysiological diagnostics. The aim of the pedagogical testing was to clarify and assess the communicative competence level.

To determine and evaluate the level of language communicative competence of the students who studied German, we used worksheets – lexical and grammatical test tasks on two aspects: “spoken language” (general everyday aspect) and “language for special purposes” (professionally oriented aspect). In each aspect, we provided the tasks which were divided into language ones, aimed at meaningful assimilation of foreign language material at the level of knowledge; conditional speech, aimed at developing knowledge to the stage of automatism; and speech tasks, in which the motivation for using the obtained material for communication purposes comes to the fore. Each task was evaluated on a special scale, which allowed us to get a score in digital terms, and also made it possible to get a quantitative measure for each component separately, and for each of the aspects of foreign language training in general.

Psychophysiological testing consisted in determining the individual typological characteristics of the students from the experimental group. Such individual characteristics as “introversion – extroversion”, “neuroticism” (emotional stability) were diagnosed by means of a personal questionnaire-EPI test according to G. Eysenck’s method (AJZENK, 1999). The excitation and inhibition process ratio in the central nervous system was evaluated by the results in the “individual minute” test. The current anxiety level was quantified by the psycho emotional stress indicator, determined in Spielberger’s “situational anxiety” test (SPIELBERGER, 1972). Cognitive function was evaluated based on the results of the “Attention in ranging numbers” test. The functional state of the nervous system and its properties were evaluated by such parameters as the lability and strength of the nervous system, the mobility of nervous processes and the balance of the processes of excitation and inhibition in the nervous system.

The second stage involved the use of psycho physiological testing results to determine the students’ psycho typological characteristics and, on this basis, to differentiate the means, methods and training material applied in the experimental program.

The third stage involved the first part of the pilot training program implementation and was carried out over a period of four weeks.

The fourth stage was an intermediate pedagogical testing, the results of which served as the basis for the fifth, correctional, stage.

The fifth stage was to use the results of pedagogical testing to correct the tools, methods and training material. After such a correction, carried out in an operational mode, the students moved on to the next stage.

At the sixth stage, we continued to implement the second part of the pilot training program with the adjustments already made, which also lasted for four weeks.

The seventh stage included final pedagogical testing, the results of which, in comparison with the data of the entrance testing, served as the basis for assessing changes in the level of students’ communicative competence from the experimental group and determining the effectiveness of the developed training program.

At the same time, training in the control group was carried out in accordance with the program provided by the university curriculum, but according to the traditional methodology without the differentiation of means, methods and teaching material. As in the experimental group, input and output testing was carried out in the control group as part of monitoring the level of students’ communicative competence.

As a result of psycho physiological testing of the students from the experimental group, carried out at the first stage of the experiment, their psycho typological characteristics were determined.

The analysis of psycho physiological testing results showed that in the experimental group consisting of 24 male and 22 female students, 22 students were extroverts, and 24 were...
introverts. Twenty-two students were discorcondants (students with a relatively high level of neuroticism), and twenty-four were concordants (students with a relatively low level of neuroticism). Twenty-four people had a high level of situational anxiety, and twenty-two - a low level. 26 students had a high level of lability and a relatively high level of attention. 20 students were less attentive and 20 had a relatively low level of nervous system lability.

These characteristics were considered when selecting teaching materials, tools and methods of teaching in order to individualize the pedagogical process and increase its effectiveness.

**RESEARCH RESULTS**

Table 1 shows the average value of the level assessments in training students learning a foreign (German) language from control and experimental groups registered in the input, intermediate and output tests in the framework of the general household aspect.

The pedagogical testing results analyses of the students’ communicative competence in general everyday language aspect from both groups showed that their initial values were almost at the same level and did not statistically differ both in individual and in the total components for the entire aspect.

After the entrance test, as part of monitoring the initial level of students’ communicative competence, the experimental group began implementing a training program based on the provisions of the cognitive-systematizing development of foreign language readiness concept. At the same time, the content of the teaching material, the means and methods of teaching were to a certain extent selected and differentiated individually in accordance with the psychotypological characteristics of the students.

At the end of experimental training lasting for a period of four weeks the level of foreign language proficiency was tested (intermediate testing). The results presented a communicative competence level increase in both students’ groups. At the same time it should be emphasized that a more significant growth of communicative competence level was taken notice of in the experimental group. Thus, the control group showed the level increase of 9.8 %, while the experimental group showed the level increase of 23.4 %.

The same growth dynamics is represented in four communicative competence components of general everyday language aspect. The control group showed the components increase from 6.2 % up to 19.8%, in contrast, the communicative proficiency level increase (proficiency in individual components) in the experimental group was within the range from 10.1% to 29.7%.

The intermediate testing results (individual components are taken into consideration) have given rise to personalized improvement of pedagogical technologies, course contents and learning tools quantity.

Then the pedagogical experiment was decided to proceed in accordance with the updated programme. The second part of the experimental pedagogical process also lasted for four weeks. On completing this part, final communicative competence level in both groups was tested (final testing).
Table 1. Average evaluation parameters of students’ foreign language (German) proficiency level of general everyday language aspect (X±m) at the Volgograd State Technical University

| Components of foreign language proficiency | Control group (n=40) | Experimental group (n=46) |
|--------------------------------------------|---------------------|--------------------------|
|                                            | At the beginning of the experiment | In the middle of the experiment | At the end of the experiment | At the beginning of the experiment | In the middle of the experiment | At the end of the experiment |
| Linguistic component (general everyday language aspect) | 9,4±0,3 | 10,4±0,4 | 12,7±0,5* | 9,4±0,3 | 12,0±0,4 | 14,3±0,6* |
| Figurative-speech meaningfully-formal component (general everyday language aspect) | 4,6±0,5 | 5,3±0,3 | 6,3±0,4* | 5,3±0,3 | 6,8±0,3 | 8,4±0,5* |
| Figurative-speech meaningful component (general everyday language aspect) | 6,0±0,5 | 6,3±0,5 | 7,1±0,7 | 7,3±0,4 | 7,9±0,4 | 8,8±0,4* |
| Speech component (general everyday language aspect) | 7,4±0,6 | 8,1±0,7 | 9,7±1,2 | 8,7±0,6 | 11,1±0,9 | 13,8±1,1* |
| Total points on general everyday language aspect | 27,5±1,1 | 30,1±1,3 | 35,9±2,0* | 30,7±1,2 | 37,8±1,5 | 45,3±2,0* |

Source: search data

Notice: Here and in Table 2: * - accuracy of differences between the testing results at the beginning of the experiment and at the end of the experiment is presented according to Student t-test under p<0,05.

The final testing results showed that positive dynamics of students’ communicative competence increase is maintained in both groups. In addition, the growth of foreign language proficiency in the experimental group is more significant in comparison with the control group, as it happened to be after the first part of the experiment.

This is evident from the fact that the sum of points in respect of the general everyday language aspect of students’ foreign language proficiency in the experimental group increased by 47,7% (P<0,05), on average, while the control group showed the increase only by 47,7% (P<0,05).

It is important to state, that in the experimental group students’ level of foreign language proficiency in respect of the general everyday language aspect (individual components) demonstrated a good statistically increase in all cases (P<0,05); whereas valid positive changes in the control group were registered only by two components out of four (Table 1).

The same situation was monitored in the dynamics of foreign language proficiency level within professionally-oriented communicative competence aspect (Table 2).
Table 2. Average evaluation parameters of students’ foreign language (German) proficiency level of professionally-oriented aspect (X±m) the Volgograd State Technical University

| Components of foreign language proficiency | Control group (n=40) | Experimental group (n=46) |
|--------------------------------------------|----------------------|--------------------------|
|                                            | At the beginning of the experiment | In the middle of the experiment | At the end of the experiment | At the beginning of the experiment | In the middle of the experiment | At the end of the experiment |
| Linguistic component (professionally-oriented aspect). | 9,3±0,3 | 11,1±0,6 | 13,6±0,8* | 9,1±0,3 | 12,0±0,4 | 14,3±0,5* |
| Figurative-speech meaningfully-formal component (professionally-oriented aspect). | 11,4±0,8 | 11,9±0,7 | 13,7±0,4* | 12,1±0,7 | 13,3±0,2 | 14,7±0,2* |
| Figurative-speech meaningful component (professionally-oriented aspect). | 6,1±1,0 | 6,9±1,1 | 7,5±1,2 | 7,1±0,6 | 9,1±0,7 | 10,5±1,0* |
| Speech component (professionally-oriented aspect). | 8,4±0,6 | 9,4±0,6 | 11,0±0,7* | 9,4±1,2 | 12,2±0,9 | 16,0±1,1* |
| Total points on professionally-oriented aspect. | 35,3±1,7 | 39,3±1,8 | 45,8±1,5* | 37,8±2,3 | 46,7±1,8 | 55,6±2,4* |

Source: search data

The intermediate testing results of professionally-oriented aspect components of foreign language proficiency reflected their significant increase in both groups.

Furthermore, as it was in respect of the general everyday language aspect of foreign language proficiency, the increase of professionally-oriented aspect level proved to be more evident in the experimental group in comparison with the control group, taken as a whole (by 25,4% and 11,5% respectively) and with the constituent components (by 13,3-38,6% and 4,5-20,0% respectively). The comparative analysis of final testing results in respect of the foreign language proficiency within professionally-oriented aspect also revealed a more essential growth in the experimental group in comparison with the control one.

The integral estimation of this foreign language communicative competence aspect in the experimental group increased by 49,4% (P<0,05), on average; while the control group showed the increase only by 30,6% (P<0,05). At the same time all components of this communicative competence aspect in the experimental group also increased to a greater extent (in the range from 25,4 % to 83,2 %) and in all cases this increase is statistically valid (P<0,05). Meanwhile, in the students’ control group, where there was only positive and significant increase of all components in respect of the professionally-oriented foreign language proficiency aspect (in the range from 23,9 to 46,4%), the most statistically relevant changes were registered in three components out of four.

CONCLUSIONS

Thus, the pedagogical experiment results, organized and conducted on the basis of principles and main strategies of the concept named as cognitive-systematizing development of students’ foreign language competence showed cogently the following thing. The pedagogical process should be based on gradual formation of communication cognitive strategies and built on the integration of system-structural and generalizing methods, the method of lexico-grammatical mapping, the algorithmic method of sub-language specialty phenomena, the interactive method of classroom and extracurricular learning activity and the method of extensible syntags. It should be stressed that strict allowance for students’ individual psycho-typological characteristics and the continuous monitoring relating to the communicative proficiency level must be provided as a system. Consequently, all of these factors taken together allow to increase effectiveness of academic materials mastering and uplevel students’ foreign language communicative competence at non-linguistic universities.
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The development of foreign language communicative competence of students at the non-linguistic university based on cognitive-systematizing approach

Desenvolvimento de comunicação de língua estrangeira acerca das competências não linguísticas dos estudantes de uma universidade com base em uma abordagem de sistematização cognitiva

Desarrollo de la comunicación en lenguas extranjeras sobre las habilidades no lingüísticas de los estudiantes universitarios a partir de un enfoque de sistematización cognitiva

Resumo
O artigo descreve os resultados de um experimento pedagógico organizado e realizado com base nos princípios e disposições básicas do conceito de desenvolvimento cognitivo-sistematizante da competência comunicativa de língua estrangeira. Mostra-se que o processo pedagógico, baseado no desenvolvimento gradual de estratégias cognitivas e comunicação, baseia-se na integração de uma ampla gama de métodos que levam em consideração as características psicotípicas individuais dos alunos. Estabelece que, em condições de monitoramento do nível de proficiência na língua estrangeira, isto oferece mais eficácia para dominar o material de estudo e um aumento substancial do nível eficiente estranho competência comunicativa de alunos matriculados em uma universidade não linguística.

Keywords: Foreign language communication competence. Cognitive-systematizing development. System-structural and generalizing methods. Compression of educational material. Individual typological features of students.

Palavras-chave: Competência comunicativa em línguas estrangeiras. Desenvolvimento cognitivo-sistematizador. Métodos sistémicos-estruturais e generalizadores. Compressão de material educativo. Características tipológicas individuais dos estudantes.