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USE OF THE LEADING CHANNEL OF INFORMATION PERCEPTION IN TRAINING ENGLISH

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Abstract

This article presents the adaptive-developing methodology of teaching foreign languages on the basis of using the leading channel of the perception of information. The methodology developed by us is based on the use of the leading channel of the perception (auditory, visual and kinaesthetic) of the information by students. To implement our methodology for teaching foreign languages, we propose to use the pedagogical algorithm developed on the basis of the knowledge acquisition scheme for teaching foreign languages. The article describes the stage of diagnosing the students' channels of perception and examines in detail each stage of learning the algorithm for implementing the methodology. The tasks are developed at all stages of training in accordance with the types of speech activity adopted in the teaching methodology. The problem of orientation of methodologies and methods of education to the personal characteristics of students is one of the most important in the psycho-pedagogical sciences, which causes a lot of controversies. The personal sphere is so individual and diverse that its study, diagnostics, and analysis make it possible to obtain new results in the development of teaching methods. The effectiveness of experimental training according to the adaptive-developing method was confirmed by the fact that the number of students with a high level of formation of foreign-language competence in the experimental group is 14.55% higher than that in in the control group.

Keywords: Channel of perception, method of teaching, pedagogical algorithm

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1. Introduction

Social and cultural transformations in modern society are obvious. The modern stage of society development is characterized by the growing dynamics of interaction between members of society at all levels and in all spheres of life, which entails awareness of the need and the growing social demand for a foreign language as a means of communication and as an instrument for the development of the personal sphere. Particular attention is paid to the problems of developing new methodological systems of education in accordance with the strategic directions of informatization and modernization of domestic education. The current situation in the educational space is also characterized by the recognition of the apparent rapid increase in the volume of educational information and the backlog of teaching methods. Therefore, in the context of modern globalism the attention in education is paid to the development of existing and the search for new teaching methods (Arsaliev, 2016). The demand for a foreign language as a means of communication in conditions of modern globalism, changes in the personal sphere in the context of the information stage of the development of the community and the increasing role of the communicative functions of the individual in its successful self-realization determine the relevance of developing new methods of training based on the effective use of individual personality characteristics.

Many works are devoted to the problems of development of methods of training on the basis of the principle of differentiation. Principles and mechanisms of perception have been considered by Bronbent, Zinchenko, Lindsey, Norman, Sokolov, Carello, Carterette, Friedman, and others. The bases of the neurolinguistic programming theory (NLP) have been described by (Bendler, Grinder, Ditls, Belyanin, Dymshits, Liver, and others. The analysis allows drawing the conclusion that in modern educational institutions a lesson continues to remain the main form of the organization of teaching and educational process therefore the main attention needs to be given to a solution of the problem of methods and organizational forms of subject training and education in modern conditions of information society and global communications.

Many well-known and recognized foreign language training methods, such as mixed (Shcherba, Rakhmanov), social and communicative (Gurvich, Mirolyubov), structural and functional (Starkov, Slobodchikov, Shapko), the methodical concept of the Moscow school of training foreign languages (Rogova, Vereshchagina, Bim), a method of activization of reserve opportunities of the personality and Kitaygorodskaya's group, a lingvo-social-cultural method (Ter-Minasova, Maslova), etc. are put in a basis of modern methods of training foreign languages. Let us to mention the Davydova's express methods which appeared at a boundary of the 20-21st centuries, an intel-method (intellectual method), an emotional and semantic method by Shekhter, a case-method, Runov's methods, Milosevic, the method of reading proposed by Frank, the Supreme Learning system of Shestov, the foreign language training program of Nikulicheva, a course of a foreign language of Rumyantseva and also a communicative method of training speaking foreign language of Kuzovlev and Passov and Levental, Zamyatkin, Dragunkina, Baytukalov and Gromyko's modern techniques (matrix technique), a method of projects, Petrov's technique, and many others testify to high degree of scientific interest to the problem of training foreign languages. In the direction of use of personal features in training among many others it is necessary to remember the technique of the individualized training considering influence of cognitive

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styles of students proposed by Liver and the technique of the differentiated training according to properties of nervous system of students (on dynamic types: weak, inert, strong, mobile), offered by Akimova and Kozlova.

2. Problem Statement

The research problem is connected with the search of possible way of making foreign languages training more effective by means of development of training methods based on use of leading channel of information perception. We have to answer the following question, essential to the solution of the problem: How could we use the characteristics of the personal sphere of students in order to improve the effective teaching of foreign languages?

3. Research Questions

What is the current state of the theory of differentiated learning? What are the psychological and pedagogical foundations of the use of the principle of differentiation in teaching foreign languages? What are the forms and criteria for differentiating educational information and students, their dependence on the stages of the educational process? What are the factors of formative influence on the student, ensuring his personal development in the direction of formation of foreign-language competence and increase in the efficiency of educational and cognitive activity? What is the procedural part of teaching foreign languages on the basis of the principle of differentiation? What are the principles for implementing foreign language education using differentiation? What are the results of testing the developed methodology in a general education institution, how effective is it?

4. Purpose of the Study

The purpose of the study is to develop, theoretically justify and experimentally test the methodology for teaching foreign languages on the basis of the principle of differentiation in a general education institution. The object of the study is the educational process in the discipline "Foreign Language" in general education institutions. The subject of the study is teaching English in general education institutions on the basis of the principle of differentiation. The problem of orientation of methodologies and methods of education to the personal characteristics of students is one of the most important in the psycho-pedagogical sciences, which cause a lot of controversies. The personal sphere is so individual and diverse that its study, diagnostics, and analysis make it possible to obtain new results in the development of teaching methods.

5. Research Methods

The methodological basis of the study is a four-level hierarchical structure in which we use approaches distributed in accordance with the levels of methodological analysis: philosophical level (principles of cognition, genetic and evolutionary approaches), general scientific level (system approach), specifically scientific (differentiated and personally oriented approaches) and methodological

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(communicative-cognitive approach). The methodology of this research make also the principle of systematic assuming consideration of the pedagogical phenomena in terms of their complete characteristics (Blauberg, Davydov, Capra, Lomov, Merlin, Reshetova, Sadovsky, Yudin, etc.); the principle of determinism, which determines the causal relationships of the object; the principle of ascent from general to single and again to volume, implemented in this study as a movement from theory to practice of educational activity, and then to the construction of a theoretical model of the formation of pedagogical reality (Knyazeva, 2007).With the participation of professional programmers, we developed a special computer program for working with neurogarniture, which meets the requirements of our research. Software was created in the development environment VisualStudio 2010 in the programming language C # using NetFramework 4 and WindowsForms. The software architecture is based on the MVC (Model – View – Controller) principle. When running on a computer, the program invites a trainee equipped with a neurogarniture to perform specially selected tasks aimed at leading audio, visual and kinaesthetic channels of information reproduction and at the same time captures data from the MindWave, measuring the level of user's attention and concentration during each of the tasks. As a result of the analysis of the data presented on the graphs generated by the program, it is determined which tasks cause difficulties, and which students easily copes with. Based on this, the leading channel of information perception in a trainee is determined, which becomes the basis of further differentiation of trainees. In the absence of neuro garniture, a teacher can use special techniques to determine the leading channel of perception in students, described in detail in the work.

6. Findings

6.1. Education system as a base of new training methods

The concept of the system (Arsaliev, 2017) is widely used in the cognate disciplines (linguistics, pedagogy, psychology, etc.). In this connection, the idea of a systemic organization of language was developed by the representatives of the structural direction in linguistics, which set themselves the task of identifying and classifying the units of language and establishing the most common types of relations between them (Cohen-Scali, 2012).

As a result of the analysis of the numerous interpretations of education system that exist in pedagogy and the methodology of education (Kureychik & Pisarenko, 2013, 2017), we concluded about the complexity and ambiguousness of this concept in teaching theory. We use as the basic four-component system, consisting of four structural components: a hierarchy of learning goals, information technology supporting the learning process, a student, a teacher (Figure 1). Let us note that as components of the system we mean the personality of the teacher and the student with a certain set of personal characteristics, qualities and competences.

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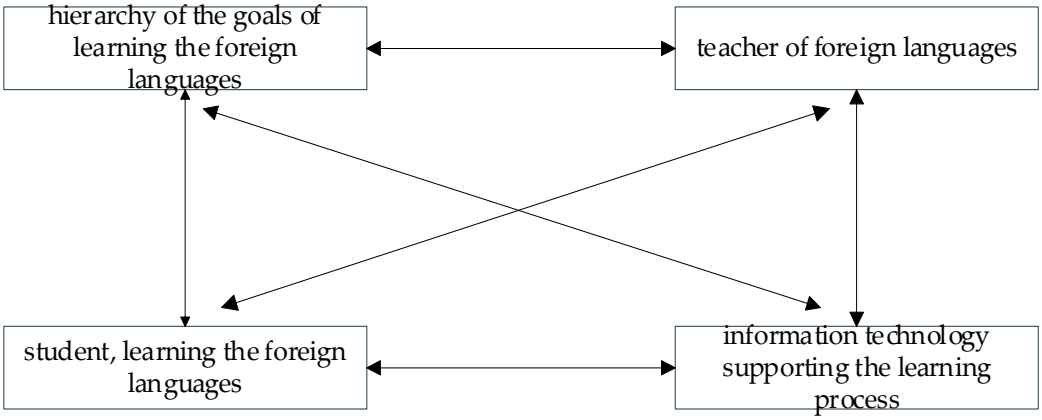

Figure 1. The system of teaching foreign languages

The hierarchy of learning goals is considered by us as the main component associated with all the others. The goal-setting in the system of teaching foreign languages should be presented in the form of a hierarchy of goals: the goals of the state, the goals of the education system and the goals of an individual. *A student* who learns a foreign language is the next component of the system. The high schooler as a subject of educational activity is a person who made a choice (or obeyed to the choice of a reference environment for him) to continue teaching (Lebeaume, 2011). *A teacher* of a foreign language is another component of this system. Here the problem of subjective qualities of the teacher, which determine the effectiveness (productivity) of the pedagogical activity, has become the subject of a special theoretical and experimental study. The last component of the system of teaching foreign languages - *information and technology supporting the learning process* - is a combination of information and technology components, interconnected functionally and structurally, and directed at the realizing the goals of the learning process. In fact, this is a didactic system consisting of two components. The first component - the information component - implements in the educational process within the didactic complex of information support of the academic discipline (Loveland, 2012; Pisarenko & Arsaliev, 2016). The second component implements through the technology of teaching that has been projected and realized by the teacher. All the information that is necessary for a teacher and a student, both in the process of individual activity and in the process of their interaction, is provided by training resources. The next component of information and technological support of the learning process is the teaching technologies. In view of the personal orientation of modern education, the importance of accounting the personal characteristics for improvement of the effectiveness of the learning process and using as a basis the system described above of teaching foreign languages, having studied and analyzed the existing methods of teaching foreign languages, created on the basis of the leading channel of perception the information (verbal, auditory, visual, kinesthetic, two-channel, multichannel methods), we developed our own adaptive-developing methodology of teaching foreign languages, oriented not only to improve the learning efficiency of a foreign language, but also to exercise those channels of perception the information that the learner has developed deficiently (Pisarenko & Bondarev, 2016).

The adaptive-developing methodology is based on the use of the leading channel of perception (auditory, visual, kinesthetic) the information at the students. To implement our methodology for teaching

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foreign languages, we propose to use the pedagogical algorithm developed on the basis of the scheme of knowledge assimilation for teaching foreign languages, depicted in Figure 2.

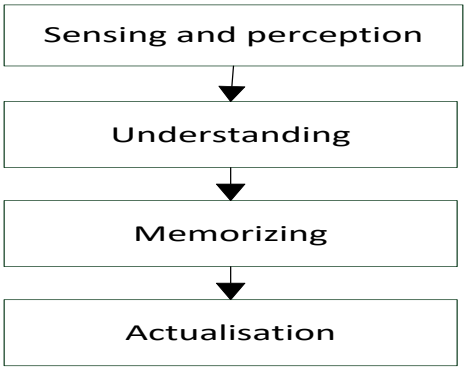

Figure 2. Scheme of the process of knowledge assimilation for teaching

Using this procedure, we propose a structural diagram of the algorithm of the procedural part of the adaptive-developing methodology of teaching foreign languages (Figure 3), based on the use of the leading channel of perception the information. The algorithm represents the main stages of teaching in accordance with the main activities in the teaching of foreign languages.

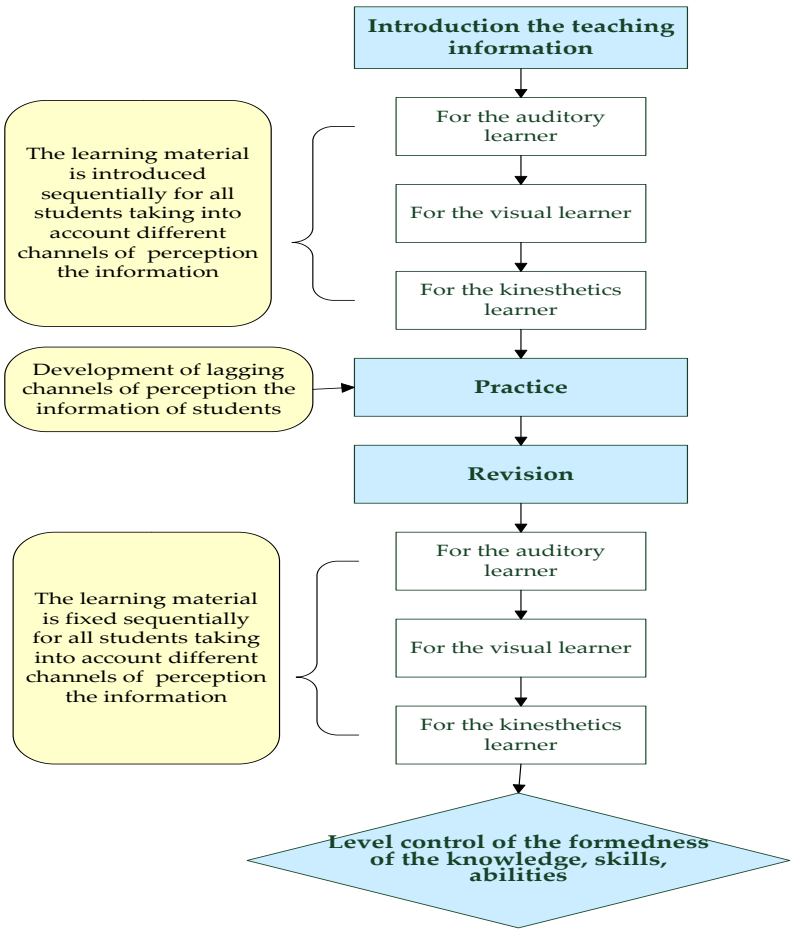

Figure 3. Structural scheme of the learning stages of the algorithm to implement the methodology of teaching foreign languages

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At the first stage of preparation, we studied the concept of "brain waves" and analyzed the means for recording them. We know that the human brain is a colossal neuronal network. When we think, we experience various emotions and feelings and then special cells, neurons, interact with each other through the special processes called axons. This kind of interaction has an electrochemical nature. When large groups of neurons (hundreds of thousands) interact at a time, as a result of electrochemical activity, an electric field of sufficient power is generated to be fixed from the outer part of the head. As a result, the sensors located in certain places of the head and adjacent to the skin can perceive this kind of information. More importantly, the modern development has shown us that in order to obtain an electroencephalographic (EEG) signal from the brain with a medical accuracy of not less than 96%, it is sufficient to use one dry sensor that fits snugly against the anterior frontal part of the skull. In addition, an indifferent sensor is used. Such a sensor is used to connect to the so-called "zero point", that is, to a part in which there is no bioelectric activity of the brain. When EEG devices are in operation, the "zero point" of the indifferent sensor connection is used to measure the potential difference with the main, working sensor. The indifferent sensor is usually attached to the ear lobe. Thus, we get the initial, so-called raw signal from the brain. Usually the raw signal is obtained in the range from 0 to 70 Hz. In this signal, we can identify certain ranges that reflect certain types of brain activity. Typically, there are 5 main ranges, namely: Delta wave, Theta wave, Alpha wave, Beta wave, Gamma wave.

Certain wave levels corresponding to the indicated ranges in the general spectrum correspond to certain types of brain activity. It is possible to allocate several directions of the use of neuro-headset in various areas: for games and entertainment, to manage programs and devices; for self-development, for personal mental trainings, for trainings on the development of children, improving their academic achievement; for the work of psychologists, psychologists - consultants, other professional use. We chose a neuro-headset between two companies: Emotiv and NeuroSky.For our research, NeuroSky'sMindWave neuro headset was chosen.

We have developed a special software application for this device, which meets the requirements of our research. At startup on the computer, the software application developed by us for the neuro headset MindWave offers to make specially selected exercises for auditories, visuals, kinesthetics and at the same time fixes the data with MindWave, measuring the concentration level of the user's attention. Considering the data obtained in the diagnosis of students, we can more elaborate the types of exercises that correspond to certain modalities, both in a stressful situation and in a comfortable environment; analyze the abilities of the test-takers and choose the best way of learning. Special software application is launched on the computer, configured to determine the level of concentration of the user's attention. Headset MindWave dresses on the head of the student; the exercises on auditory, visual and kinesthetic channels of perception are offered for performance. When performing a certain exercise on the screen, we can observe the graph of the student's concentration of attention.

According to the test results, it is determined which exercises caused difficulties, and with which the learner coped easily. Based on this, his leading channel of perception is determined.

The experimental group was offered tasks that allow determining different types of leading channels of perception the information in order to identify the difficulties that arise when performing different types of exercises among representatives of different channels of perception. For the purity of

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the experiment, each student was tested separately in the office along with the teacher and tasks. The group was offered two tests. At the beginning of the eighth grade, a test was offered in the form of start control. At the end of the ninth grade, the final testing was conducted. All tasks were selected in accordance with the age of the students and the training program. In the group there were pupils with all three channels of perception the information: visual, auditory, kinesthetic channels of perception. Accordingly, the tasks were selected to use the auditory, visual, kinesthetic channels of perception the information. All students were given the same tasks, despite their leading channel of perception in order to identify the difficulties. The results obtained after the experiment were graded by us on a 5-point system.

Based on the results obtained, it can be concluded that this student is a visual learning to produce better when focusing on visual details. Information processing is available through analysis, oral pronunciation and writing. Student with the leading visual channel of perception is able to follow step by step for the visual instructions.

The stage of introduction the teaching material. When we introduce new material, it is necessary to consider that for students with a leading auditory channel of perception it is recommended to use audio material for better perception of new information. Students with a visual channel of perception will better remember the new material when using a blackboard or video materials. A training hand-out is needed for students with a leading kinesthetic channel of perception. The material is entered sequentially for all students considering different channels of perception.

The stage of material training is also a stage of the development the lagging channel of perception the information. At this stage, we offer a practical material with recommendations for learning the types of speech activity - reading, speaking, listening and writing.

The stage of fixing the teaching material. Material is introduced sequentially for students considering different channels of perception the information. Therefore, we consider it necessary to offer also several recommendations on the types of tasks for the development the channels of perception the information at the stage of fixing the material.

The stage of control. Control is the definition of reference for language achieved by students over a certain period of training. Monitoring allows: 1) a teacher to receive the information: about the results of the work of the group, students in general and each student individually; about the results of their work (to find out how effective the methods of teaching, to determine the failures in the work, which allows making changes in the teaching program); 2) students: to increase motivation in learning, as a control indicates about the success or failure in work; to study more diligently, make adjustments to their educational activities.

The general description of the stages of the implementation of the adaptive-developing methodology for teaching foreign languages, based on the use of the leading channel of perception the information, a brief description of the teaching of all the main types of foreign speech activity, gives a general idea of the methodology that we propose. It should be noted that the main advantage of the adaptive-developing teaching methodology is its focus not only on optimizing the perception of educational information by using the leading channel of perception the information, but also on the development the other channels of perception the information of the student. As a result, this adaptive-

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developing methodology of teaching foreign languages is focused on the general development of the student personality, improving his cognitive competence.

7. Conclusion

The main scientific results obtained by the authors are as follows:

– It has been established that considering the specifics of each stage of cognition (perception, understanding, remembering, updating) when students learn the content of the educational discipline "Foreign Language" allows increasing the effectiveness of learning and contributing to the development of the personality of students through the improvement of learning skills.

- It has been established that in differentiated foreign language training, each stage of the educational process corresponds to its own forms of differentiation (trainees – at the stage of diagnostics, educational information – at the stage of introducing educational material, exercises – at the stage of training and fixation of educational material) and criteria for differentiation of educational information (adaptation to a certain channel of information perception, orientation to the development of a certain channel) and trainees (through the leading, defending channels of information perception).
- It is justified that in a modern general education institution, foreign language education is carried out in a four-component methodological system, which includes a hierarchy of the goals of teaching, the personality of the student and the teacher of a foreign language, as well as information and technological support for the educational process, represented by a combination of information (the content of training and formed foreign-language competencies) and technological (methods, forms, means and technologies of teaching) components.
- It was found that the factors of formative influence in training foreign languages on the basis of the principle of differentiation are: 1) the competence of a foreign language teacher in the field of differential education; 2) differentiation of educational information adapted to perception through audio, visual and kinaesthetic channels of information perception; 3) differentiation of exercises, the content of which is aimed at the formation of foreign-language competencies, the formulation of the task and the form of execution of which are aimed at the development of additional channels of information perception; 4) use of methods of diagnostics of trainees, based on the use of new information technologies and allowing the teacher to detect dynamics of functioning of the leading and additional channels of information perception in the educational process.
- On the basis of the principle of differentiation, the essence of which consists in the formation of foreign-language competencies while improving the educational activities of students through the development of channels of information perception; the adaptability of the educational process is reflected in the orientation of the communicative learning environment and teaching material submission forms to the first channel of information perception.
- The technique of diagnostics of a student's leading channel of perception of information based on the analysis of changes of his physiological state (increase and decrease in tension) with use

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neuro garniture MindWave (NeuroSkyThinkGear technology) is developed and presented in the algorithm form. The developed diagnostic method made it possible to differentiate students for the subsequent implementation of diffuse foreign language training.

- The procedural part of teaching foreign languages on the basis of the principle of differentiation is presented in the form of a pedagogical algorithm combining six stages (targeting, diagnosis, differentiation, training, control, development and improvement of foreign-language competencies, improvement of educational and cognitive activities). The formalization of the educational process in the form of a pedagogical algorithm ensures its reproducibility and the possibility of creative use by teachers and methodologists.
- The system of methodological principles for teaching foreign languages includes: the principle of observing the individual trajectory of mastering subject knowledge, the principle of adapting the forms of submission of educational information to the next channel of perception among students and the principle of developing additional channels of information perception.

The effectiveness of experimental training according to the adaptive-developing method was confirmed by the fact that the number of students with a high level of formation of foreign-language competence in the experimental group is 14.55% higher than in the control group; that the average absorption ratio of educational material in the experimental group is higher than in the control group by 0.8; that the increase of the average experimental group achievement score is higher by 0.4 than in control group, while the average experimental group achievement score is higher than in control group with complete identity of training programs. At the control stage in the experimental group the number of trainees experiencing difficulties in performing tasks oriented to non-main channels of information perception decreased by 37%, that is, 37% of trainees began to use all three channels of information reproduction equally effectively. Such changes were not recorded in the control group at all.

The results obtained in experimental training confirm the correctness of the advanced theoretical prerequisites. The adaptive and evolving method of teaching foreign languages based on the use of the leading channel of information perception among students contributes to the more successful formation of foreign-language communicative competence of students and creates conditions for the development and improvement of perception skills in the educational process, which ensures the development of the personal sphere of the student.

The validity of the results obtained by the author, the conclusions formulated in the study, are determined by the clarity and consistency of methodological positions, multi-point analysis of the problem, the validity of the initial methodological provisions, the use of a set of methods adequate to the object, purpose, the results of the study, the long-term nature and personal participation of the authors in experimental work. Harmonization of developed provisions with theoretical areas of pedagogical science had been achieved. The accuracy is confirmed by the quantitative and qualitative analysis of experimental training data.

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