

FORMATION OF CHEMISTRY TEACHERS' COMPETENCIES FOR THE ORGANIZATION OF STUDENTS' SELF-ACTIVITIES

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Within the framework of the theory of sustainable education, self-education is considered as the core of an integral system, penetrating the the effectiveness of its functioning at different stages of human life. However, it is necessary to state the fact of the lack of conceptual research aimed at helping students in the formation of their readiness for teaching leraners self-educational activities, the absence of works analyzing the role of pedagogical disciplines in the process of forming this type of readiness in future teachers. The study of students of Baku State University was aimed at identifying their readiness to teach leraners self-educational activities. It has been established that, the effectiveness of the process of forming students' readiness to teach leraners self-educational activities is ensured by the implementation of a system of pedagogical conditions: the implementation of a comprehensive analysis of students' readiness to teach leraners the skills of self-educational activity.

Besides, the process of forming students' readiness to teach leraners self-educational activities is presented in the form of pedagogical technology that ensures the implementation of a set of creative tasks, non-traditional methods and forms, pedagogical situations, directed pedagogical impact on the activation of self-educational activities of students of a pedagogical university, their preparation for teaching leraners for self-educational activities.

Keywords: self-education, chemistry teachers, chemistry education, sustainable education.

INTRODUCTION

Reforming higher education within the framework of the Bologna process in Azerbaijan requires addressing the problem of preparing the younger generation - the organization of continuous self-education. The educational policy of Azerbaijan is determined by the principles that are reflected in the Law "On Education" of the Republic of Azerbaijan (Paragraph 3. Basic Principles of State Policy in the Field of Education. <https://e-ganun.az/framework/18343>), as well as the Order of the President of the Republic of Azerbaijan on financing and expanding the scope of educational programs with new content in Higher Education dated November 15, 2024 (<https://president.az/az/articles/view/67327>). Today we have to reflect not on the burden of time, but on the burden of everyone's responsibility, on the fact that a completely new self-exactingness is needed. The teacher should be aware of this postulate as the need for personal self-development and self-improvement, as a readiness to form in his students the need for systematic self-improvement and self-education. In this regard, the focus of professional training of teachers on the formation of their readiness to teach leraners self-educational activities gives this process a new quality, expressed in the ability of the educational system to provide all subjects of the educational process with a system of opportunities for effective personal self-

development. A constructive solution to the problem of forming students' readiness for self-educational activities will also optimize the transition of a student from secondary school to professional school, which is associated with a radical restructuring of the main type of activity - educational. The university offers the student a new system of education, different from the school one, which is characterized by a large amount of studied material, an increased level of independence and responsibility. As a result, the student is forced to overcome the contradiction between the requirement of independent mastery of knowledge and the lack of experience in its organization.

A general education school should build a kind of promising frame of cognitive activity in the student, launching a mechanism for independent solution of tasks, mastering educational and professional experience. Such competence of a student in the field of independent cognitive activity, based on the assimilation of ways of acquiring knowledge from various sources of information, including extracurricular ones, can be formed only by a teacher who is aware of the importance of self-educational activity both for his own self-development and professional self-determination, and for teaching learners self-educational activities. However, the existing practice of training future teachers indicates a significant weakening of the attention of higher education to the problem of forming students' readiness to teach learners self-educational activities. The analysis of the literature shows that today there is no holistic theoretical substantiation of the potential of students' self-educational activities; their aspirations for the development of their own individuality, self-realization, satisfaction of needs, interests, initiatives. In view of this, it becomes obvious that there is a need to search for theoretical and methodological approaches to the formation of the educational environment of the university in the context of preparing students for teaching learners self-educational activities. The formulation of these theoretical and methodological foundations will make it possible to build a comprehensive technology for the formation of students' readiness for teaching learners self-educational activities and to develop appropriate methodological support.

In the literature, "Self-education" is considered not only as an independent mastery of knowledge [1], but also as the construction, creation of one's own personality [2], while the person "absorbs not so much a narrowly understood specific knowledge, information, as acquires and absorbs the entire human culture, enters into various relationships with it, developing and acquiring creative and ethical ones" [3-5]. Parantham considers self-education as the basis of effective socialization [2]. Razumova recognizes self-education as one of the most dynamic forms of increasing the level of professional readiness of a specialist [6]. The target function of self-education, according to Stanchikas, is that it is a means of professional growth [7]. China scientists consider self-education as an integral part of self-education and self-improvement of the individual [8]. The essence, features and functions of self-education, its place in professional activity are determined by research [9-10]. In the works of these authors, self-education is considered as a special type of professional self-development of a future specialist [4,11-13]. Various aspects of self-education are revealed in the works [14-15]. They studied the essence of professional pedagogical self-education; the creative activity and independence of the individual in the acquisition of knowledge are revealed; the relationship between independent and self-educational activities was revealed; the social roots of self-education have been studied; the role of self-education in the education of learners is shown [6, 16]. Within the framework of the theory of continuous education, self-education is considered as the core of an integral system, penetrating the effectiveness of its functioning at different stages of human life [17]. In pedagogical works on advanced training of professional figures, self-education is recognized as one of the most dynamic forms of raising the level of a specialist [18].

Management of self-educational activities within the framework of the system "lesson - homework - extracurricular forms of work" are studied [19]. The role of interdisciplinary links in stimulating self-education is reflected in the works [20]. The stimulating effect of pedagogical practice in students' self-educational activities has been shown [21]. There are programs on the theory of education and the basics of pedagogical skills, focusing on professional and pedagogical self-improvement [22, 23]. Pedagogical and

social psychology, studying the internal mechanisms of self-regulation, considers self-education as an integral part of self-education, self-improvement and self-development of the individual [24, 25]. The analysis of the research indicates a wide variety of options proposed by scientists in order to solve the problem of self-education, the most important issues of the theory and practice of self-education have been studied: social aspects of self-education, the nature, features and functions of self-education, its place in professional activity, ways and means of forming the need and desire for self-education, the problems of self-education of the teacher [26-28]. It can be stated that the theoretical foundations of pedagogical self-education have been developed, the relationship between self-education and the effectiveness of the teacher's professional activity has been substantiated. At the same time, a comprehensive solution to the problem of forming the readiness of future teachers to teach learners self-educational activities was the subject of a very limited number of pedagogical studies [29-30].

It is necessary to state the fact of the lack of conceptual research aimed at helping students in the formation of their readiness to teach learners self-educational activities, a limited number of works analyzing the role of pedagogical disciplines in the process of formation of future teachers. The study of students of Baku State University in the specialty "Chemistry Teacher" was aimed at identifying their readiness to teach learners self-educational activities. Of the total number of respondents (42 people), 83.4% of respondents admitted that they are not ready to teach learners self-educational activities. In addition, the students themselves are not systematically engaged in self-education, mainly during the preparation period. for exams, when performing term papers and graduation qualification works. Thus, the theoretical and pedagogical analysis and the results of diagnostic sections of research on the process of forming students' readiness to teach learners self-educational activities have revealed objectively existing contradictions: - between the need to form in the younger generation the need for independent development of the ever-growing flow of information, independent mastery of the set of values, the idea of world culture and the insufficient readiness of educational institutions to provide students with the required level of mastery of the methods of self-educational activity; - between the requirement of the time to train competent teachers in pedagogical professional educational institutions who are able to form students' interest in self-educational activities, to organize them for the formulation and solution of self-educational tasks, to form the need to systematically update and enrich the methods of self-educational activity and the unpreparedness of universities to solve this problem due to the lack of development of conceptual provisions and technology of the process of formation of self-educational activities. students' readiness to teach learners self-educational activities.

The established contradictions and the lack of instrumental methodological support for the training of future teachers for teaching learners self-educational activities, as well as the not fully used innovative functions in building the educational environment of a modern university, allow us to assert that in pedagogical theory and practice there is a problem of scientific substantiation of the prerequisites, principles, pedagogical conditions and technologies that ensure the effective formation of the system preparation of students of pedagogical universities for the formation of self-educational activities in learners. The indicated contradictions and the problem made it possible to formulate the goal of the study: the development of conceptual, methodological, scientific, pedagogical and organizational-systemic foundations for the formation of students' readiness to teach learners self-educational activities. At the same time, the object of the study was the professional training of future teachers. The subject of the research was the conceptual, methodological, scientific, pedagogical, organizational and system support of the process - the formation of future teachers' readiness to teach learners self-educational activities. The hypothesis of the study was that the developed conceptual provisions for the formation of the process of formation of readiness for self-education in future teachers will be implemented and will confirm their effectiveness if their theoretical foundations are substantiated, taking into account a number of approaches to scientific knowledge, concepts and pedagogical theories, formative work, as well as a model of the formation of students' readiness to teach

leraners self-educational activity, which provides for the coordination of requirements for the level of training of a modern teacher and specific technologies of his training with the university.

EXPERIMENTAL

The methodological basis of the research is the dialectical theory of the universal connection, interdependence and integrity of phenomena and processes of reality; provisions on the creative essence of a person, the development of his professional abilities in the process of activity, on the role of personal position in self-development and self-education. The study was carried out in several stages: Stage I - analysis of pedagogical literature, development of the research concept, preparation of materials for the ascertaining stage of the experiment aimed at identifying the existing level of readiness of students to teach leraners self-educational activities. Stage II - conducting an experiment, analyzing the results of experimental work, systematizing the data obtained; development of a system of tasks for the formative stage of experimental work, focused on the formation of students' readiness to teach leraners self-educational activities. Stage III - generalization of the results obtained. Stage IV - formulation of conclusions, implementation of research results in the practice of higher and secondary vocational educational institutions. The experiment was carried out at the Faculty of Chemistry of Baku State University, among bachelor's students of 1-4 years of study in the specialty "Chemistry Teacher". The study involved 84 students (42 students in the experimental group and 42 students in the control group). The initial moment in the study of students' readiness for teaching leraners self-educational activities was a questionnaire survey aimed at studying the attitude of students to self-educational activities. At the stage of the experiment, according to these criteria, the initial level of students' readiness to teach leraners self-educational activities was determined.

But the results of the questionnaire revealed that in the experimental group, self-educational work: - consider it an educational formality – 52.4% of students - as a way of acquiring knowledge and skills necessary for the future professional activity of a teacher - 28.6%; - as a work of independent professional, applied and research value - 19%. The content of the experimental work included practical tasks (in the form of a project) to study the readiness of students to teach leraners self-educational activities. Task 1. Choose one topic from the course of lectures and design a model for teaching leraners self-educational activities on its example. Task 2. To present a project for individual training of leraners in self-educational activities, taking into account leisure and recreation, the quality of life in the family, district; Success in school Task 3. To develop a system of expert assessments to determine the quality of self-educational activities of leraners. In the course of the study, observations were made of students' activities when performing practical tasks and working with a questionnaire. The study of students' activities in lectures and practical classes made it possible to determine the presence of professional skills in the latter.

RESULTS AND DISCUSSION

The results obtained indicate that teaching leraners self-educational activities requires multifaceted preparedness of teachers for this work. According to our data, students find it difficult to objectively assess their own capabilities in the organization of self-educational activities, it is difficult to assess the presence of certain skills necessary for the implementation of self-educational activities both their own and self-educational activities of leraners. This contradiction was revealed by the analysis of materials on the students' skills to organize self-educational activities of leraners. The need to create a system of self-educational activities open to innovation, cooperation, coordination, and full assimilation of cultural achievements has caused the need to update self-educational systems in educational institutions and optimize the conditions for self-realization and self-determination of an individual in the system of new social relations. One of the leading tasks in solving the

problem of self-education is the ability of students to teach learners to independently design a system for obtaining knowledge.

The grounds for the development of the concept of the formation of students' readiness for teaching learners self-educational activities were the ideas of self-actualization of the personality and the genesis of self-educational activity. It is revealed that self-educational activity turns out to be effective if it involves a creative solution of pedagogical problems, enriches the motives of self-education, causes a sense of satisfaction with the process of promotion and the results achieved. Since the process of self-education acts as an independent activity of the student, it is naturally aimed at solving the problem of mastering the skills of self-education by the student. Self-education is considered as one of the most important professional functions of a teacher, which actualizes the need for a serious attitude of theory and practice to the formation of students' readiness for this type of activity.

The concept of the study is based on methodological approaches, which served as a guideline in the development of the very concept and model of the process of forming students' readiness for teaching learners self-educational activities. Their implementation made it possible to study the student's personality holistically, to consider it in all its manifestations; to build relationships with students on the basis of the principle of humanism; to stimulate the student to systematically search for ways to improve the methods of self-education; to convince students that the acquisition of vital knowledge and ways of studying it is the meaning of the teaching profession and serves as the basis for teaching students self-educational activities. The provisions of the concept show that the processes of self-education and self-development are in dialectical unity, because self-education contributes to the process of self-development, and since a person is constantly in the process of development, self-education is the way to self-development. The solution of such a serious task is called upon to be carried out by a teacher who has perfectly mastered the skills of self-educational activity. To form certain skills in learners to perform a particular type of activity is the teacher who himself has the necessary skills. At the present stage of training future teachers, this type of activity of a vocational educational institution should become the leading one in the formation of a competitive teacher. Taking into account the main characteristics of self-educational activity, we consider the readiness of students to teach learners self-educational activity as an integrative quality of personality, • the content of which is the presence of a motivational component (interest in knowledge, increasing erudition, preparation for professional activity); cognitive component (awareness of the essence of self-education, ideas about the importance of self-education for a person, operates with examples of outstanding people); operational component (the ability to design self-education, determine the system of work methods, the ability to foresee the result of activity); abilities (quickly read the content, retain information in memory for a long time, the ability to transfer knowledge to a new situation); personal component (self-knowledge, volitional tension, focus on overcoming difficulties); self-management (self-analysis, self-control, self-assessment) (Table 1).

The next stage of the study was aimed at identifying the level of students' readiness for self-educational activities.

In the course of this experiment, such methods as questionnaires, testing, conversations, interviews, observations, ratings, self-assessment, analysis of activity products, problem solving, trainings, etc. were used.

Table 1. Results of the pre-test of competencies for self-educational activities in the control and experimental groups

| Competences | Levels EG/CG (Per cent, %) | | |
|-----------------------|----------------------------|-----------|------------|
| | High | Medium | Low |
| Self-awareness | 23.8/19 | 26.1/38 | 50.1%/42.8 |
| Skills | 28.5/14.3 | 33.3/19 | 38/66.6 |
| Lider | 14.3/12 | 23.8/23.8 | 62/64.3 |
| Empathy and tolerancy | 23.8/14.3 | 33.3/14.3 | 42.8/71.4 |

Analysis of results. ascertaining experiment made it possible to actualize the search for ways to increase the effectiveness of self-educational activities of students by means of educational and socio-pedagogical activities. The program of the formative stage assumed overcoming the causes of difficulties in students' self-educational activities. The work was aimed at overcoming such negative aspects as: lack of experience in self-educational activities; adaptation to new conditions of the organization and course of the educational process; lack of experience in independent organization of various types of activities. At the formative stage of experimental work in the organization of educational activity, a significant part of the time was devoted to the independent work of students, their work in groups, and participation in frontal forms. As a result of purposeful activity to create optimal conditions for mastering the skills of self-educational activity, students changed their idea of the essence of self-educational activity, its importance for the teacher.

In general, a set of tasks was implemented in working with students: - formation of students' ideas about the essence of self-education, awareness of the importance and significance of self-education for further pedagogical activity; - formation of a set of social and personal qualities, creative skills, mastering the techniques of self-education; - teaching students the skills of self-educational activity; - creation of a social and professional environment in the group, which forms a subjective position in the student, which optimizes his attitude to self-education in the educational process, provides independence and confidence in participation in various types of educational and extracurricular activities; forms an awareness of the importance of self-education, awareness of the reliability and predictability of the results of the educational process, confidence in one's strength and capabilities; - training in the skills of reflexive management of one's experience, self-awareness and self-organization.

As part of the organized formative experiment, students mastered social roles that allow them to adapt more effectively in their future professional activities and personal lives. Educational activity allowed students to observe patterns of behavior and communication in the person of teachers, to learn a moral attitude to the surrounding reality. When constructing a pedagogical model of such a space, we proceeded from the understanding of the educational environment as a factor that determines the process of students' self-education. As a result, the state of students' readiness for self-educational activity after the formative stage is shown in the table.

Table 2. Results of the post-test of competencies for self-educational activities in the control and experimental groups.

| Competences | Levels EG/CG (Per cent, %) | | |
|-----------------------|----------------------------|-----------|-----------|
| | High | Medium | Low |
| Self-awareness | 47.6/19 | 38/38 | 14.3/42.8 |
| Skills | 52.4/14.3 | 28.6/19 | 19/66.6 |
| Lider | 52.4/12 | 33.3/23.8 | 14.3/64.3 |
| Empathy and tolerancy | 42.9/14.3 | 38/14.3 | 19/71.4 |

The tables show the positive dynamics as a result of the stage of the formative experiment on the development of students' readiness for self-educational activities. The next stage of the study involved the construction of a model for the formation of students' readiness for teaching self-educational activities.

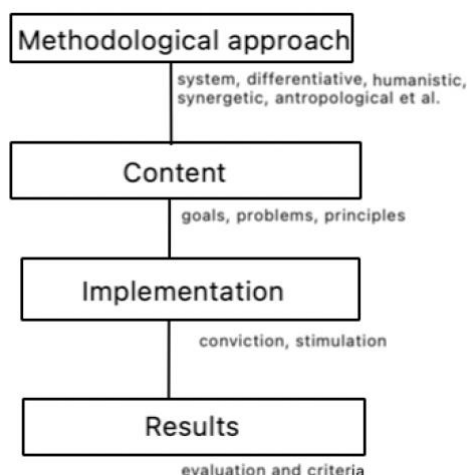


Fig.1. Model of formation of readiness to organize self-study activities of students

This model includes four blocks: methodological, content, operational-implementation, results.

I. Methodological approach: conceptual provisions of the study and methodological approaches (systemic, personality-oriented, differentiated, synergetic, anthropological, activity, culturological, axiological, humanistic).

II. Content: goal (formation of a competent teacher, way!! We - self-educational activities and be able to organize learners for independent acquisition of knowledge, to educate them in the need for systematic self-education and interest in this type of activity),

III. Implementation - creating conditions for the maximum disclosure of each student's potential in the organization of interpersonal communication with students, mastering knowledge and skills to conduct a dialogue, at the same time, to show tolerance and empathy, reflection of one's own behavior in the process of teaching learners self-educational activities; creation of an atmosphere of creative approach to the process of teaching learners self-educational activities; formation of students' skills of self-knowledge, i.e. self-analysis of their own capabilities in teaching learners self-education; the ability to reveal, analyze and actively use their potential in teaching learners self-educational activities; creation of conditions for each student to realize the possibility of acquiring skills of a creative approach to working with learners, principles and content of the process of forming students' readiness for teaching learners self-educational activities); principles (activity, consciousness, consistency; democracy in relations; reliance on the foundations of partnership and cooperation; continuity and consistency of the formative influence; communicativeness; creation of conditions for the fullest interpretation by students of various methods and techniques of teaching learners self-educational activities; assistance to students in revealing their inner potential; reliance on positive elements in students' activities); timeliness of pedagogical support; the principle of independence; the principle of individuality; the principle of substance; the principle of choosing methods of organizing work; the principle of success);

IV. Results - the content of the formative work (a system of various activities used at the stages of activity: the stage of formation of students' readiness for self-educational activity; the stage of the formation of awareness by the future teacher of the need to teach learners self-educational activity; the stage of the formation of skills to teach learners self-educational activity).

The readiness of students to teach learners was considered at the motivational, emotional, activity, reflexive, and effective levels.

Motivational level is the attitude of students to work with learners.

Emotional level is the emotional state of students, their communication with learners.

Activity level: possession of the ability to teach learners self-educational activities.

Reflexive level - self-control over one's behavior, communication with learners; self-analysis of the strengths and weaknesses of their activities; self-assessment of work with learners.

These criteria make it possible to determine the levels of students' readiness to teach learners self-educational activities: low - reproductive (knowledge and skills of using self-education techniques are poorly expressed, there is an inability to teach learners the skills of self-education); middle - creative, partially independent (search for possible options - reproductive achievement of the goal, creation of conditions for the implementation of the goal); high - creative and independent (complete independence, creation of conditions for achieving the goal, the ability to set students up for a positive and emotional tone in work). In the course of experimental work, this model was implemented, and there was a positive trend in the readiness of students to teach learners self-educational activities. In the process of its formation, students not only acquired didactic skills, improved and enriched the methods of teaching learners this type of activity, but also formed personal qualities.

The main indicators of the effectiveness of the work on the formation of students' readiness for teaching learners self-educational activities were:

- the presence of high working capacity based on the formed interests; the presence of a need for self-knowledge, self-development, self-improvement, self-nutrition;
- adequacy of assessments and self-assessments (the ability to analyze one's own behavior; the ability to study oneself and others);
- consistency in actions aimed at teaching learners - various types of activities; the ability to justify a request, demand; the ability to compare, analyze opinions and conduct a dialogue;
- the ability to understand the state of the student; - the ability to rearrange the actions depending on the situation;
- the ability to find a way out of prot-speech situations;
- the ability not only to perform an action, but also to justify the correctness of this performance; motivation of his student; the formation of an active creative position, high moral qualities, a sense of responsibility for the entrusted work, self-discipline;
- the ability to understand and support the interlocutor, to call him to a trusting dialogue.

Positive dynamics as a result of the stage of the formative experiment took place due to the implementation of the system of pedagogical conditions:

- the first level is the development of a training program (specific disciplines are designated; the frequency of tasks is determined; the content of tasks and methods of their implementation is gradually complicated);
- the second level is to stimulate learners to self-educational activities;
- the third level is the organization of interaction with students (in the distribution of tasks, in the process of monitoring the progress of tasks, in the analysis of completed tasks and their evaluation);

Experimental work on the formation of students' readiness for teaching learners self-educational activities was organized as follows:

- enrichment of the content of education of pedagogical disciplines with materials on the essence of the process of teaching learners, modern didactic research on the features of self-educational activity, the nature of self-educational activity of learners;
- inclusion in the study of particular methods of additional information about the content and methods of teaching learners self-educational activities;
- strengthening the role of active teaching methods (didactic and business games, educational discussions and heuristic conversations, research seminars, educational conferences, poster presentations, analytical commentary on books and articles) aimed at preparing students for teaching learners self-educational activities;
- updating the method of creative design (group projects that reveal the specifics of the learning process of each individual age group of learners);
- changes in the organizational forms of professional training (saturation of lectures with individual tasks for teaching students self-educational activities, for example, conducting

mini-lessons by students with elements of self-educational activities on the example of the selected section of the lecture plan, etc.; saturation of seminars with problematic issues on the organization of self-educational activities, increasing its effectiveness and at the same time - issues of teaching learners this type of activity, business games, etc.; activation of consultative forms);

- introduction of pedagogical diagnostics of students' ideas about the essence of the process of teaching learners self-educational activities (analysis of tasks performed by students, questionnaires, control sections of knowledge about the essence of the process of teaching learners self-educational activities, etc.).

Upon completion of the implementation of the indicated directions, the following dynamics of the formation of students' readiness for teaching learners self-educational activities was obtained.

CONCLUSIONS

In general, the study allows us to state the following conclusions:

- The pedagogical system for the formation of students' readiness for teaching learners self-educational activities includes several stages: pedagogical diagnostics of the student's readiness for self-educational activities; designing a system for the formation of students' readiness for self-educational activities; design of a system for the formation of students' readiness to teach learners self-educational activities; analysis of the effectiveness of the system for the formation of students' readiness to teach learners self-educational activities.

- The effectiveness of the process of forming students' readiness to teach learners self-educational activities is ensured by the implementation of a system of pedagogical conditions: the implementation of a comprehensive analysis of students' readiness to teach learners the skills of self-educational activity; determining the criteria for the readiness of students to teach learners self-educational activities; integration of the processes of education and self-education; students' need for self-educational activities; the use of technology in working with students that ensures the development of their creative skills and consistent mastery of self-education techniques; the presence of students' skills of interaction with students;

Besides, it has been experimentally proven that the concept of forming the readiness of students to teach learners self-educational activities can serve as a scientific, methodological, organizational and pedagogical justification for solving the problems of optimizing the professional training of a modern teacher. The process of forming students' readiness to teach learners self-educational activities is presented in the form of pedagogical technology that ensures the implementation of a set of creative tasks, non-traditional methods and forms, pedagogical situations, directed pedagogical impact on the activation of self-educational activities of students of a pedagogical university, their preparation for teaching learners for self-educational activities.

RECOMMENDATIONS

The theoretical provisions and conclusions contained in the study can be used to provide scientific and technological support for the process of forming students' readiness to teach learners self-educational activities. The concept developed in the study creates real prerequisites for the scientific support of the training of teaching staff for the formation of the educational environment of the school, focused on the self-educational activity of students. The model, pedagogical conditions and technology proposed by the author for the formation of students' readiness to teach learners self-educational activities make it possible to significantly increase the pedagogical effectiveness of the university's activities in the context of preparing students for continuous self-education, to achieve a qualitatively new level of educational results.

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