

## FORMATION OF STUDENTS' COGNITIVE ACTIVITY WITHIN LIFELONG EDUCATION

### *FORMAÇÃO DA ATIVIDADE COGNITIVA DOS ALUNOS NA EDUCAÇÃO AO LONGO DA VIDA*

### *FORMACIÓN DE LA ACTIVIDAD COGNITIVA DE LOS ESTUDIANTES DENTRO DE LA EDUCACIÓN PERMANENTE*

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**ABSTRACT:** Integration and globalization in the structure and various spheres of human activity require modernization of the educational space, which should form active and creative individuals who need a thorough theoretical and practical training. After all, today the ability to think is of particular importance, that is, to isolate and analyze phenomena, processes, to notice the essential in them, to draw appropriate conclusions, to make assessments and to make timely, balanced decisions. The article also discusses the issues of increasing the cognitive activity of students in the context of the implementation of the Federal State Educational Standard. First of all, we are talking about the development of techniques and methods for the formation of skills for independent acquisition of knowledge, without which it is very difficult for a modern person to live in the modern world. A correct understanding of the Federal State Educational Standard and its implementation on the ground will qualitatively improve the training of a modern student - a future specialist.

**KEYWORDS:** Cognitive activity. Learning process. FSES. Self-study. Self-development.

**RESUMO:** *A integração e a globalização na estrutura e nas diversas esferas da atividade humana exigem a modernização do espaço educacional, que deve formar indivíduos ativos e criativos que necessitam de uma formação teórica e prática aprofundada. Afinal, hoje é de particular importância a capacidade de pensar, ou seja, isolar e analisar fenômenos, processos, perceber o essencial neles, tirar conclusões adequadas, fazer avaliações e tomar decisões oportunas e equilibradas. O artigo também discute as questões do aumento da atividade cognitiva dos alunos no contexto da implementação da Padrão Educacional do Estado Federativo (FSES, sigla em inglês). Em primeiro lugar, estamos falando do desenvolvimento de técnicas e métodos para a formação de habilidades para aquisição independente de conhecimento, sem o qual é muito difícil para uma pessoa viver no mundo moderno. Uma compreensão correta do Padrão Educacional do Estado Federativo e sua*

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*implementação no terreno melhorará qualitativamente a formação de um aluno moderno - um futuro especialista.*

**PALAVRAS-CHAVE:** *Atividade cognitiva. Processo de aprendizagem. FSES. Autoestudo. Autodesenvolvimento.*

**RESUMEN:** *La integración y la globalización en la estructura y en las diversas esferas de la actividad humana exigen la modernización del espacio educativo, que debe formar individuos activos y creativos que necesitan una profunda formación teórica y práctica. Después de todo, hoy la capacidad de pensar es de particular importancia, es decir, aislar y analizar fenómenos, procesos, percibir lo esencial en ellos, sacar conclusiones apropiadas, hacer evaluaciones y tomar decisiones oportunas y equilibradas. El artículo también discute los problemas del aumento de la actividad cognitiva de los estudiantes en el contexto de la implementación del Estándar Educativo del Estado Federativo (FSES, siglas en inglés). En primer lugar, estamos hablando del desarrollo de técnicas y métodos para la formación de habilidades para la adquisición independiente de conocimientos, sin los cuales es muy difícil para una persona vivir en el mundo moderno. Una comprensión correcta del Estándar Educativo del Estado Federativo y su implementación en el terreno mejorará cualitativamente la formación de un estudiante moderno, un futuro especialista.*

**PALABRAS CLAVE:** *Actividad cognitiva. Proceso de aprendizaje. FSES. Autoaprendizaje. Autodesarrollo.*

## Introduction

The relevance of this article is due to the fact that the dynamic changes taking place in the life of people, society, the state, the course of scientific and technological progress change the idea of the essence of educational practice, which is increasingly focused on the transition to the concept of "multiple" education of a person throughout his active life. In the "Concept for the modernization of Russian education for the period up to 2030" it is emphasized that "a developing society needs modern educated, moral, enterprising people who are able to independently make responsible decisions in a situation of choice, be mobile, dynamic, constructive specialists, and have a developed sense of responsibility for the fate of the country" (GORSHKOVA, 2005). In this regard, the problem of ensuring the quality of education through the development of the cognitive activity of each person, who, in the process of education, not only masters a certain standard of modern knowledge, but also learns to apply it in real life, comes to the fore. He is constantly in the mode of innovative cognitive search for the necessary information in order to apply it in the existing socio-economic, intellectual and cultural conditions of his life. The formation of a modern specialist is inherently associated with his formation as an integral, humane, comprehensively developed personality, as well as his

professional training, carried out in the higher education system. That is why the issues of the formation of cognitive activity, professional self-development of specialists and the definition of organizational and pedagogical conditions, within which these processes are most effective, acquire their special relevance.

## **Methodology**

When constructing this study, the achievements of leading experts in this field were used. So, Ya. V. Shvedova, A. N. Mikhailov, N. M. Simenova and others define cognitive activity as a manifestation of the volitional, emotional and intellectual sides of the personality in the educational process. T. V. Luzina, S. Yu. Lavrent'ev, D. A. Krylov, N. I. Zakharova and others consider it as "the unity of activity, in which the personality of the student himself is manifested with his attitude to the content, nature of the activity and the desire to mobilize his moral and volitional efforts to achieve educational and cognitive goals". I. Yu. Krutova, E. V. Zavalishina, E. S. Zhukova prove that cognitive activity is the strongest stimulus for the formation of an integral personality, the level of which depends on the development of interest in the system of other motives (ZAVALISHINA, 2018).

N. V. Deryabina, I. N. Kokorina, T. M. Lazareva note that cognitive activity develops and forms along the ascending line in the learning process.

O. O. Gorshkova notes that studies of the cognitive processes of a modern person indicate that the current society is not satisfied with the hypertrophy of the mind in the activity of the individual, because, as proved by psychologists, the excessive development of any one function leads to its exhaustion and hopelessness.

We agree with the opinion of E. G. Babaskin that the computer should first of all solve the problem of information support of the educational process. This includes the quality level of informational presentation of educational material, including consistency, clarity, problematicity, mobility and depth of presentation. It also guarantees the prompt presentation of information of this type (optimal both in volume and content), which is currently needed by the teacher (teacher) and student (student).

In addition, the authors used methods for analyzing special scientific literature on this topic. The comparative method made it possible to identify the best methods of implementing the Federal State Educational Standard for achieving optimal results of enhancing the cognitive activity.

## Results

Changes in the field of production technologies make it necessary for a specialist to form “special over-professional, or rather extra-functional knowledge, skills, properties, qualities and abilities that ensure his professional mobility, competitiveness and social security” (BABASKINA, 2013). For the development of these qualities, a high level of formation of a person's cognitive activity is required. Professional skill is defined as an integrative, clearly structured quality of a specialist's personality, which allows to carry out professional activities more effectively, as well as contributing to self-education and self-improvement in professional activities. Components of this quality are professional knowledge, the skills of a specialist, and the level of creative use of them. In the process of forming professional skills, two stages can be distinguished - university and postgraduate. At the university stage, the professional development of specialists is ensured through the development of their cognitive activity and the formation of professional readiness. The postgraduate stage is characterized by independent professional activity, in the process of which a specialist's professional skill develops to the highest level of professionalism, the basis for which is his cognitive activity, activated during the period of professional training at the university. Cognitive activity has an impact on the formation of the student's personality, on his attitude to himself, to other people, to production. At the same time, cognitive activity is the basis for the formation of students' readiness for personal self-determination in subsequent professional activities.

Formed cognitive activity is the most important condition for the success of students' learning, characterizing the attitude to the content and process of learning, the desire to effectively master knowledge, skills, skills, mobilization of moral and volitional efforts to achieve educational and cognitive goals, the formation of skills to receive aesthetic pleasure from their achievements. The analysis of various approaches to the study of issues related to the problem of the formation of the cognitive activity of the individual allowed us to derive several important provisions. Firstly, two principles are integrated in the cognitive activity of a person: the natural, which characterizes a person as a “creator in the ear”, and the cultural, which testifies to the possibility of purposeful development of this quality in the process of personality education. Secondly, cognitive activity develops in a person throughout his life and can change in connection with the reorientation of life plans and personality attitudes, contributes to the preparation for innovative activities. The characteristic of the natural beginning of cognitive activity is the spontaneity (spontaneity) of its manifestation, that is, unconsciousness on the part of the individual, and the cultural origin is characterized by

psychological new formations, which are the knowledge, skills and focus on cognitive, creative and professional activities that are realized by the individual. This gives reason to consider cognitive activity as both a prerequisite and a result of the professional skill of a specialist. In the process of the formation of cognitive activity, an important role is assigned to the formation of the value sphere of the student, which is a regulator of the social behavior of the individual, where cognitive activity should take a central place. Considering the problem of the formation of the cognitive activity of a university student, we proceed from the goals and content of higher technical education. The list of requirements for a university graduate of the current state educational standard indicates that the graduate must master the humanitarian, general technical, special subjects, master the skills and abilities in the field of the chosen profession, in the amount necessary for the successful solution of production problems in future professional activities. The professional skill of an engineer includes three components: theoretical, practical and psychological. The theoretical component provides a holistic view of professional activity as an active process. The practical component determines the readiness of the engineer to solve professional problems of design, research, operational, installation and commissioning and organizational and managerial orientation. The psychological component characterizes the personal qualities of an engineer, necessary for the performance of professional activities. A specialist with a higher technical education needs such personal and qualities as positive motivation, adaptability to the conditions of modern production, striving for personal and professional growth, and communication skills.

In the conditions of intensive renewal of engineering knowledge, it is necessary that successive links be established between all disciplines, which will allow realizing continuity in the formation and development of human cognitive activity throughout the entire course of study at a university. The process of the formation of cognitive activity proceeds effectively if the forms, methods and means of teaching are adequate to the set goals (GORSHKOVA, 2005). In this regard, special attention should be paid to the methods of forming the components of cognitive activity. For the initial assimilation of knowledge, it is necessary to use information-receptive methods that imply the communication of specially selected knowledge, the organization of the perception of information, the demonstration of samples of activity in which this knowledge is applied in practice. For the student to master the methods of mental or practical activity so that they become perfect skills and abilities, he must repeatedly apply them in a similar situation. Reproduction of methods of activity raises the assimilation of knowledge to the second level, i.e., to the level of application according to the pattern and in variable, but easily recognizable situations. The development of a person's creative abilities is possible in

activities that require creativity. Regarding the learning process, creativity can be defined as “a form of the teacher's activity aimed at creating objectively or subjectively qualitatively new values for him that have social significance, ie. important for the formation of personality as a social subject” (KOKORINA; DERYABINA, 2010). Knowledge and skills provide a search field; the experience of creative activity forms the ability to carry out this search. “The very essence of creative activity contains its peculiarity that for its implementation it is impossible to indicate a system of actions. These systems are created by the person himself” (BABASKINA, 2013). The assimilation of the experience of creative activity is carried out using problem teaching methods. In the formation of cognitive activity, forms of problem learning should be introduced into the educational process: problem presentation, partial search activity, research activity. Problematic learning, putting the trainee in front of the need to solve new, non-standard tasks, the vital importance and significance of which they are aware, develops the ability to navigate in new conditions, combine the stock of existing knowledge and skills to find what is missing, put forward hypotheses, make guesses, look for ways to be more reliable and accurate solutions. In this sense, great opportunities are presented by the problematic presentation of educational material in lectures, when the teacher raises problematic questions, builds problematic tasks. In a problematic presentation of educational material, students are exposed not only to the final results of research, but also the logic of finding solutions to the problem under consideration (GORSHKOVA, 2007; ZHUKOVA, 2008).

The purpose of the research method is to organize the search activity of trainees to solve problems and problematic tasks, while performing laboratory work. The construction of a system of such tasks allows the teacher to program the activities of the students, gradually leading to the formation of the necessary features of creative activity. The use of the research method is aimed, firstly, at the formation of the features of creative activity; secondly, the organization of creative assimilation of knowledge; third, to ensure the mastery of the methods of scientific knowledge in the process of activity; fourthly, on the formation of interest, the need for creative activity. The heuristic method assumes a step-by-step assimilation of the experience of creative activity. Using the heuristic method, the teacher guides the search, consistently poses problems, formulates contradictions, creates conflict situations, builds the steps for completing the assignment, and the students independently seek solutions to parts of the problem that arise at each link in the assignment.

The organization of the cognitive activity of trainees in accordance with the method of problematic approach brings learning closer to real activity. A high level of problematicity is

achieved using dialogue forms of work (ZAKHAROVA, 2014). With such an organization of classes, students' own positions are revealed, a personal meaning of the acquired knowledge is acquired, students are prepared for independent activity. Dialogue teaching methods are an essential component of modern teaching. "Dialogue sets the context for joint learning activities, in which the development of the subject of this activity takes place" (ZAKHAROVA, 2014). Dialogue teaching methods (discussion, dialogues, business games etc.) make it possible to intensify the process of the formation of cognitive activity. They can be implemented both during classroom sessions at lectures, seminars, practical, laboratory classes, and during extracurricular time at consultations, electives, meetings of the creative group etc. One of the forms that recreates the subject content of the future professional activity of a specialist is a business game. In the process of playing activity, action is taught through the action itself. The student performs a quasi-professional activity that carries the features of both educational and future professional activities. Thus, in solving the problem of the formation of the cognitive activity of students in the process of studying at the university, there are significant reserves for improving the quality of professional training of a highly qualified specialist. The development of cognitive activity contributes to the formation of a positive attitude towards theoretical knowledge, to educational and professional activities, the development of practical skills, the formation of professional and personal qualities of students, their motivational, cognitive and organizational readiness for professional self-education, the creation of a basis for the development of an individual style of professional activity, which contributes ensuring the professional mobility of the future specialist, his readiness for innovative activities (KRUTOVA, 2015).

The dynamic changes taking place in the life of people, society, the state, course of scientific and technological progress are changing the idea of the essence of educational practice, which is increasingly focused on the transition to the concept of "multiple" education of a person throughout his active life. The most important component of the educational process of the university is training that provides the basic characteristics of the personality and activities of a specialist. One of the main tasks is the formation of professional thinking of a practical type, which includes a high level of development of the processes of analysis, reflection, forecasting and transformation (LAVRENTIEV; KRYLOV, 2010). It is on these qualities that the success of innovative transformations in society depends, and for their development a high level of formation of the student's cognitive activity is required, who, in the process of education, not only masters a certain standard of modern knowledge, but also learns to apply it in real life. The most important link in the university management of cognitive

activity is the process of organizing students' independent work. "The level of development of independent thinking is associated with the ability to make deliberate, balanced decisions, the ability to predict the future, form a life strategy, build an adequate image of the "I", navigate situations, people, problems" (MIKHAILOV; SIMENOVA, 2013). Independent work plays an important role in the development of creative potential, components of the student's cognitive activity. With proper organization, independent work of students in the process of studying general technical disciplines can provide full, deep, active and creative assimilation of knowledge, the formation of professional, cognitive skills and abilities, contribute to the development of creativity, responsibility, initiative of students, and lay the foundations of an individual style of future professional activity. In the context of higher school didactics, the works of S. I. Arkhangelsky, M. G. Garunov, P. I. Pidkasiy, N. I. Gelashvili, M. V. Bulanova-Toporkova and others are devoted to identifying the essence of students' independent work. Students are also considered in the studies of G. E. Romasheva, A. G. Chuikov, L. A. Ryazanova, V. A. Kozakov and others. They place the main emphasis on the development of content, the formation of skills in various types and forms of independent work students. However, despite many studies, the problem of effective organization of students' independent work has not lost its relevance. On the contrary, in the context of the introduction of the State Educational Standard of Higher Professional Education, which establishes the same number of classroom and extracurricular hours for the study of a particular academic discipline, this problem is of particular importance. It should be noted that "independent work" is a complex multidimensional component of the pedagogical process, which is advisable to consider both as a form of training organization (extracurricular work of students), and as a teaching method (using independent work in classroom classes), and as a teaching tool (task system for classroom and extracurricular independent work). It is obvious that it is necessary to update the technology of teaching general technical disciplines in the aspect of enhancing the creative nature of students' independent work: its reproductive part will help to work out the basic elements of educational activity, and the creative one will be aimed at stimulating the cognitive interest and activity of the future specialist in training (LUZINA, 2006).

The concept of "independent work of students" is considered by us from the standpoint of an activity approach in the process of independent work, the student actively perceives, comprehends, deepens and expands the information received, creates novelty, solves practical problems based on the connection between theory and practice, masters professionally necessary skills. That is, there is "the formation of such thinking of students in educational activities, when its organization brings up the need for creative mastery of special knowledge,



a creative attitude to emerging problems". The essential characteristic of the concept of "independent work" is the activity of the subject, manifested in the motives of the activity, in the self-consciousness of the individual, his ability to set goals, in the freedom to choose the goal of the activity, methods and means of its realization. Signs that fix the place of independent work in the structure of the pedagogical process and its product are also important. In characterizing the scope of a concept, it is important to consider the degree of the subject's autonomy and the level of the subject's performance. When designing a place for independent work of students in the study of general technical disciplines, it is important to take into account the functions that it can perform with the appropriate organization: 1) the formation of a cognitive interest in the study of general technical disciplines, a positive attitude towards theoretical knowledge; 2) deepening of theoretical knowledge: knowledge of fundamental ideas, concepts, laws and patterns of development of phenomena, leading theories, basic categories and concepts; 3) the formation of educational activities of students. In the process of independent work, skills are formed and developed, among which the following groups are distinguished: educational and communicative; educational and reflective; educational and organizational; educational and intellectual; educational and informational; 4) the formation of such important professional and personal qualities as empathy, tolerance, emotional stability, orientation towards a personal model of interaction with people, a positive professional self-concept etc.; 5) the formation of the student's motivational, cognitive and organizational readiness for future professional self-education. Independent work is generally considered only as a form of organizing training in preparing students for seminars and laboratory-practical classes, tests and exams. In addition, its connection with the research activities of students is poorly traced. Because of this, many students do not fully understand the role of independent work in the professional and personal development of a future specialist.

As a result of the theoretical analysis, it became necessary to highlight the conditions for organizing independent work in the study of general technical disciplines, which would consider the individual characteristics of students, their needs, provide the possibility of implementing the above functions based on the implementation of the relationship between reproductive and creative components. Independent work is an important factor stimulating positive motives and initiative of students. Since the development of a personality, its preparation for life and a future profession is based on cognitive activity, and cognition acts at the intellectual level as a form of reflection of reality in the form of concepts, laws, principles and methods of cognition, it is extremely important for a teacher to consider the cognitive attitude as the internal state of the personality and its prelaunch readiness for specific activities

(GORSHKOVA, 2005). Consequently, in the practice of teaching, cognitive motives determine not only the level of cognitive activity but are a necessary qualitative criterion for a student's intellectual maturity.

## Conclusions

Thus, the complex of basic conditions for the effective organization of independent work of students in the study of general technical disciplines includes the following: implementation of an individual approach based on diagnosing the level of preparedness of students for independent educational and cognitive activities; differentiation of tasks for independent work, taking into account the forms of pre-university training of students; creation of situations of success for the formation of students' interest in theoretical knowledge, a positive attitude towards independent work in the process of studying general technical disciplines; the use of a system of tasks of a reproductive and creative nature, aimed at the formation of educational activities of students; modeling the future professional activity of students in educational assignments; ensuring the relationship between classroom and extracurricular independent work in general technical disciplines, including research activities of students; development of student reflection. The organization of independent work based on considering personal, individual characteristics, in particular the cognitive capabilities of each student, will create conditions for a gradual transition to the organization of training according to individual trajectories.

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