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METHODOLOGY FOR ENHANCING THE COGNITIVE ACTIVITY OF SCHOOL STUDENTS IN THE EDUCATIONAL PROCESS

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“99.9 percent of employees remain stuck in one place because they do not know how to think. People cannot be forced to think; they can only be provided with conditions that encourage thinking. Therefore, in educational institutions, it is more appropriate to teach learners not what to think, but how to think.”

Jack Welch

Abstract

This article examines the pedagogical and psychological foundations of enhancing school students’ cognitive activity in the educational process. It highlights modern methods and technologies, interactive approaches, and ways of applying them in classroom practice. Additionally, methodological recommendations aimed at developing students’ independent, critical, and creative thinking are provided.

Keywords

Cognitive activity, critical thinking, interactive methods, problem-based learning, creative thinking, pedagogical technology, motivation

One of the main tasks of the modern education system is not merely to transmit knowledge, but to develop students’ abilities for independent thinking, problem-solving, analysis, and drawing conclusions. In the context of globalization, only active, инициативе and creatively thinking individuals can contribute to societal development.

Thinking is something we all do and seems simple; however, in reality, even intelligent individuals can sometimes be biased and stubborn. Psychological research shows that people often make numerous errors in reasoning: they tend to overestimate their abilities, interpret the world in ways that confirm their existing beliefs, and search for causes and factors in incorrect places.

The Essence of Cognitive Activity

Cognitive activity refers to the process by which a student consciously acquires knowledge, engages in independent inquiry, asks questions, analyzes information, and draws new conclusions.

It is manifested through the following indicators:

- expressing independent opinions;
- asking questions;
- striving to solve problems;
- demonstrating a creative approach;
- performing logical analysis.

Pedagogical Conditions for Enhancing Cognitive Activity

The following conditions are essential for developing students’ thinking abilities:

- creating a free and supportive classroom environment;
- considering the student as an active subject of learning;
- organizing problem-based situations;
- providing broad opportunities for independent work;
- using modern interactive teaching methods.

Methods for Enhancing Cognitive Activity

1. Problem-Based Learning Method

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In this method, the teacher does not provide ready-made knowledge but creates a problem situation or question. Students find solutions through inquiry.
Result: development of logical and critical thinking.

2. Brainstorming

A large number of ideas are generated in a short period without criticism.
Result: formation of creativity and free thinking.

3. Cluster Method

Concepts related to a topic are organized into a network or structure.
Result: development of systematic thinking.

4. Discussion and Debate

Students defend their opinions and provide arguments.
Result: development of speech culture and critical thinking.

5. Project Method

Students independently prepare projects.
Result: development of research, planning, and practical thinking skills.

6. Role-Playing Games

Real-life situations are simulated.
Result: development of creative and emotional thinking.

Modern Pedagogical Technologies

The following technologies are considered effective in enhancing cognitive activity:

- ICT (Information and Communication Technologies);
- interactive learning;
- competency-based approach.

STEAM Education

Distance and Blended Learning

Practical Recommendations

The following recommendations are suggested for teachers:

- Ask open-ended questions;
- Use questions such as “Why?” and “How?” during lessons;
- Allocate more time for group work;
- Provide analytical tasks instead of relying solely on tests;
- Encourage and reward students who express independent opinions.

Increasing students’ cognitive activity in the educational process improves the quality of their knowledge and contributes to their development as independent and creative individuals. The effective use of interactive methods, problem-based situations, and modern pedagogical technologies is a key factor in this process.

Therefore, every teacher should organize lessons not merely as a means of delivering information, but as an environment for developing thinking skills.

Critical Thinking

Critical thinking is based on the ability to express one’s opinion on a given issue or problem, critically reconsider the opinions of others, justify one’s own point of view, and defend it. More precisely, thinking is a process similar to reading, writing, speaking, and listening. It is an active and coordinated process that encompasses ideas about a certain truth.

The Role of Critical (Analytical) Thinking in Education

1. It fosters mutual respect between the teacher and students, as well as among students themselves.
2. It encourages the use of students’ personal experiences during the learning process.
3. The educational content is aligned with students’ needs and presented clearly.

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4. Learning materials are used in problem-solving processes.
5. Different opinions and perspectives are integrated.
6. Initial assumptions are accepted and critically examined.
7. Learning occurs through relationships between teacher and students, as well as among students themselves.

Conditions are created for students to engage in independent learning, and teaching methods are selected according to their level of preparedness. Didactic game-based technologies used during lessons activate students' cognitive activity, promote independent work with textbooks and supplementary materials, develop communication skills and culture, and consciously guide them toward professional orientation. These technologies also help students correctly navigate difficulties arising during the learning process and analyze various situations to draw accurate conclusions.

The organization of problem-based or discussion-based lessons in accordance with curriculum requirements plays an important role in developing critical and analytical thinking. Two types of discussion-based lessons are commonly used in the educational process: scientific discussion lessons and free-thinking lessons.

Interactive Methods

Interactive methods are a set of actions aimed at mutual exchange and enrichment of ideas, involving both verbal and non-verbal communication. When applying interactive methods, intellectual activities based on interaction do not merely serve as stimuli but also guide participants toward creative inquiry, help reveal unknown aspects, and support the formation of theoretical and analytical reasoning.

In mastering educational content, the following interactive teaching methods are used appropriately, depending on students' knowledge level, comprehension ability, learning sources, and didactic objectives:

- Visual teaching methods;
- Independent work methods;
- Problem-based heuristic modeling methods;
- Scientific research methods;
- Problem-based and reproductive teaching methods;
- Inductive and deductive teaching methods;
- Methods of assessment and self-assessment.

Classification of Methods

These methods can be divided into the following groups:

First group: Methods of acquiring educational information through listening (verbal methods: narration, lecture, discussion).

Second group: Methods of acquiring educational information through visual perception (visual methods, demonstrations, illustrative presentations, etc.).

The use of various strategies is characteristic of lesson systems based on interactive methods. In such systems, students are not prohibited from using auxiliary tools (such as books, notes, etc.); on the contrary, the use of such resources is encouraged. In order to develop students' creative potential, stimulate them to find both standard and non-standard solutions to problems, reveal their inner feelings, and encourage logical thinking, comparison, and analytical reasoning, the problem-based method is widely applied. This method also contributes to the formation and further development of students' intellectual abilities and ingenuity.

How is a problem situation created? First, a task that must be completed is announced. In order to accomplish this task, the student recalls previously acquired knowledge and skills, but at the same time realizes their insufficiency. This leads to a psychological contradiction within the student. As a result, a new problem emerges: the need to complete the task and to search for new knowledge, abilities, and skills required for its solution. This moment marks the beginning of problem-based learning.

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The teacher skillfully manages the students' independent work process, carefully observes them, and, when necessary, engages them in live communication. During logical thinking, students' reflections and reasoning are systematically taken into account by the teacher, and at the end of the lesson, grades or points are assigned to active participants.

This method is also used to form generalized psychological and methodological knowledge, skills, and competencies in students, to strengthen their experience through critical analysis, to test it in real practical conditions, and to enrich practical skills with new knowledge.

It is well known that for any subject, the content is selected according to the intended learning objectives. Appropriate teaching methods are then chosen for mastering this content, followed by the selection of teaching aids and, finally, the forms of instruction. Depending on students' psychological readiness, thinking abilities, and level of knowledge acquisition, suitable content and methods are selected for each stage of education. Each stage has its own logic and methods of presenting the material.

In education, there is always a problem of content and methods, and these two are closely interconnected. The problem of teaching methods is related to the question: "Whom and how should we teach?" This implies that the development of teaching methods depends on the content of education. These two aspects are interdependent and complement each other.

The purpose of methodology is to create a new academic subject based on the given discipline and to ensure its effective assimilation. Such academic subjects should meet all students' needs and requirements, be based on modern pedagogical technologies, and follow the principle of "first learning, then teaching how to learn." They should also determine indicators and levels of mastery, establish control tasks based on the principle of "from simple to complex," and take into account individual and differentiated approaches to students.

In traditional methodology, insufficient attention is given to the development of the student's personality, particularly the progression from knowledge to skills and from skills to competence. Teachers often attempt to provide as much information as possible about the topic. However, they do not always follow the three-stage model of cognition: collecting information, selecting and processing it, and applying the acquired knowledge.

At the next stage, students' cognitive activity should elevate them to a higher level—activating their thinking processes. Only then does knowledge transform into skills, and skills into competencies. The activation of students' cognitive activity is based on several principles: stimulating interest in the subject, relying on key concepts, applying problem-based methods, organizing independent work, combining group and individual activities, using visual and technical tools, linking education with real life, and establishing interdisciplinary connections.

From this, the main principles that teachers must follow in the educational process emerge:

- fostering students' self-confidence;
- providing timely assistance when needed.

Developing critical thinking is not an easy task. It is neither a process completed at a certain age nor a skill that can be easily forgotten. There is no single definitive path to critical thinking; however, there are certain educational conditions that facilitate its development. To acquire critical thinking skills, students need time and opportunities, namely:

- providing opportunities for reflection;
- accepting diverse ideas and opinions;
- ensuring active participation in the learning process;
- fostering confidence in each student's ability to think critically;
- valuing the emergence of critical thinking.

Accordingly, students should:

- build self-confidence and understand the value of their ideas;
- actively participate in the educational process;
- listen attentively to different opinions and ideas;

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- be ready to form and revise their judgments.

Critical (analytical) thinking is directly related to student activity. Students often remain passive listeners, believing that knowledge belongs to the teacher or is fully represented in the text, and therefore the teacher is responsible for their learning. However, active participation and a sense of responsibility for their own learning lead to effective outcomes in critical thinking.

Encouraging students to think, express their ideas, and share them with others increases their activity. It is important to instill in students the understanding that their thoughts and analytical conclusions are valuable. Teachers should avoid requiring students to mechanically reproduce material based on ready-made templates. Otherwise, students may develop the belief that reproducing others' ideas is the most valuable activity.

In reality, students must be shown that their own ideas and perspectives are important. They should develop confidence in the value of their thoughts and recognize their contribution to discussions. The thinking process involves exchanging ideas among students. During such exchanges, students are expected to listen attentively, avoid imposing their views on others, and refrain from interrupting or correcting speakers unnecessarily.

In turn, students gain the opportunity to benefit from the collective ideas of others. As a result of broad discussions, they improve their ability to analyze and refine their own ideas and integrate them into their system of knowledge and life experience. Several models can be used to organize the thinking process, including building self-confidence, active participation, exchanging ideas with peers and teachers, and listening to others.

Overall, the development of students' critical (analytical) thinking plays a crucial role in implementing educational and developmental principles in higher education.

A creative thinker is a person who is able to:

- understand logical relationships between ideas;
- express thoughts clearly and concisely;
- identify, analyze, and evaluate arguments;
- assess the advantages and disadvantages of decisions;
- evaluate evidence against hypotheses;
- detect inconsistencies and common errors in reasoning;
- systematically analyze problems;
- determine the relevance and significance of ideas;
- justify their beliefs and values;
- reflect on and evaluate their own thinking abilities.