



DEVELOPMENT OF CRITICAL THINKING IN THE LESSONS OF MATHEMATICS IN ELEMENTARY CLASSES

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-----ABSTRACT-----

In connection with the transition to 11-year education, the educational system of Uzbekistan and the methodology of teaching subjects are being modernized, starting from elementary school. The priority of modern education, which guarantees its high quality and effectiveness, should be training focused on self-improvement and self-realization of the individual. Therefore, the model of "education-teaching" has been replaced by "education interaction" through active learning", when the student's personality becomes the center of attention of the teacher, whose role is fundamentally different from the traditional one. From the point of view, critical thinking can be seen as an active and creative process.

KEYWORDS: *critical thinking, mathematics, arguments, persistence, the formation of criticality, primary school age.* -----

INTRODUCTION

In grades 1-4, the formation of the personality of a younger student takes place, the identification and holistic development of his abilities, the formation of skills, motives and desire to learn. The main directions of improving the primary education system are the introduction of new teaching technologies into practice.

Therefore, today, the problem of finding means of developing thinking abilities associated with the development of critical thinking in younger schoolchildren is urgent.

Mathematics is an exact science. And if it is easier to develop critical thinking in younger students in reading and writing lessons, is it possible to develop critical thinking in mathematics lessons? And how will this affect the overall development of schoolchildren?

How can we make sure that the ability for critical thinking not only does not decrease, but increases with age? It can be assumed that this ability should be developed starting from primary school age and should be done systematically, at every lesson and extracurricular activities.

Can systematic work in mathematics lessons contribute to the development of critical thinking in younger students? The work is devoted to this problem.

Critical thinking is open, reflexive thinking, it is the ability to develop arguments, make independent thoughtful decisions, the ability to take your position, and the ability to substantiate it, the ability to listen to the interlocutor [1,2].

A feature of this technology is that it allows lessons to be carried out in an optimal mode, the level of performance increases in children, the assimilation of knowledge in the lesson occurs in the process of constant search. From the pedagogical process of cognition. This technology provides the teacher with a system of effective strategies and techniques that allow you to create an atmosphere of cooperation, joint search for ways to solve problems.

In pedagogy, this is evaluative, reflective thinking, developing by imposing new information on personal life experience. Based on this, critical thinking develops the following qualities of the student:

- *willingness to plan (ordering thoughts is a sign of confidence in knowledge)*
- *flexibility (accepting the ideas of others)*
- *persistence (goal achievement)*



- *willingness to correct their mistakes*
- *awareness (tracking the course of reasoning)*
- *search for compromise solutions*

The technology for the development of critical thinking is based on the basic model, which includes three stages: "Challenge - comprehension - reflection". Such a construction of the educational process helps students to determine the goals and objectives of learning themselves, to actively search for new information, analyze it and relate it to their own knowledge. On the stage call, the process of updating already existing knowledge and ideas about the subject of study takes place. The organization of work at this stage allows you to form a cognitive interest, to determine the goals of considering a particular topic.

At the stage of comprehension (realization of the meaning), the student works with new information, systematizes it, learns to formulate questions as the old and new information is correlated. The stage of reflection (reflection) allows students to consolidate new knowledge and rebuild their primary idea of the material being studied. Thus, there is a holistic comprehension and "appropriation" of New knowledge, the formation of their own attitude to the material being studied [3].

Currently, society needs people who think outside the box, who are ready to act actively, deliberately reflect on the learning process, who are able to track, confirm, refute, expand knowledge, implement their ideas, make correct and deliberate decisions, work with information, analyze various aspects of phenomena. ...

The current stage in the development of education is characterized by an intensive search for something new in theory and practice. The social order of society in relation to the school has changed: the school should contribute to the formation of a personality capable of creativity, conscious, independent determination of its activities, self-regulation, which ensures the achievement of the set goal.

In the process of teaching mathematics, one may encounter the following problems, which are very difficult to solve by traditional teaching methods: the difference in the level of knowledge and skills of schoolchildren in mathematics; search for opportunities to realize the needs of students' interests through the use of a variety of information technologies[4,5].

One of the technologies that can solve the problems posed by the new standards is the technology for the development of critical thinking, the founders of which are Charles Temple, Kurt Meredith, Gina Steele. Many scientists such as Diana Halpern, Gerhard Vollmer, Karl Popper, Richard W. Paul, Scott Plouse, L.S. Vygotsky and others have different approaches to the problem of criticality.

Critical thinking is a type of thinking about any subject, content or problem in which the student improves the quality of his thinking through the skillful use of the structures and intellectual standards inherent in thinking. Signs of criticality recognized by most authors: the presence of intellectual creative initiative, the ability to assess and make decisions, etc.

The criticality of the mind is the ability of a person to objectively evaluate his own and other people's thoughts, carefully and comprehensively check all the proposed positions and conclusions. Critical thinking, i.e. creative, helps a person to determine his own priorities in his personal and professional life, assumes taking individual responsibility for the choice made, raises the level of the individual culture of working with information, forms the ability to predict the consequences of his decisions and be responsible for them, allows to develop a culture of dialogue in joint activities. Thinking critically means being curious and exploratory: asking questions and systematically seeking answers.

The following parameters of critical thinking are distinguished:

- Critical thinking is independent thinking.
- Information is the starting point, not the end point of critical thinking.
- Critical thinking begins with asking questions and clarifying the problems that need to be solved.
- Critical thinking seeks convincing reasoning.
- Critical thinking is social thinking.

Critical thinking presupposes the skills of reflection on one's own mental activity, the ability to work with concepts, judgments, inferences, questions, the development of abilities for analytical activity, as well as for assessing the similar capabilities of other people. Critical thinking in general has a practical orientation.

Criticality is often equated with creative potential, which is understood as "not only the ability to create something new in science or art, but also the non-standard attitude to oneself, one's work, communication, interaction with other people, solving a variety of problem situations and, in general, to life in general. "

Optimal for the development of critical thinking is, on the one hand, the concreteness and completeness of perception, and on the other hand, the vision of possible transformations of the object and the introduction of a creative principle and the act of perception itself. As a result of comprehensive research, it was not possible to identify the "general" factor that determines the degree of creative activity.



Thus, the manifestation of a person's critical thinking is not associated with the social conditions of his upbringing, does not have a rigid psychophysiological determination and is not reflected in the typicality of personal manifestations. The only common features of creatively active, critical people are strong individuality and emotional flexibility.

Younger school age is a very important period for the formation and development of criticality. There are environmental factors that can have a positive or negative impact on the development of critical abilities. Until now, researchers have assigned a decisive role to the special microenvironment in which a child is formed, and, first of all, to the influence of family relations. For the development of criticality, it is not a regulated environment with democratic relations and the child's imitation of a creative personality that is needed, but a developing environment in which not only certain skills and abilities could be formed, but also critical abilities. One of the socio-pedagogical conditions for the development of critical thinking is the use of programs, methods and teaching techniques aimed at developing criticality.

Researchers have shown that under certain conditions, people who previously did not show their creative powers in any way suddenly discover them. Therefore, the task of the teacher is to put the child in such conditions that he would not be afraid to show his abilities.

Methods and techniques for the formation of critical thinking in junior schoolchildren in mathematics lessons (from work experience).

During the last twelve years that I have been working at school, I have applied methods and techniques in every math lesson that contribute to the formation of critical thinking in younger students.

The criticality formation techniques that I use in my work and which, in my opinion, are the most effective, are the following:

1. Acceptance "Composing a cluster". Cluster is a method of systematizing material in the form of a diagram (figure), when the semantic units of the text are highlighted. The rules for building a cluster are very simple. I use the "Clusters" technique both at the stage of calling and at the stage of reflection, i.e. can be a way to motivate thinking before studying a topic or a form of organizing information when summing up.

Depending on the goal, I organize individual independent work of students or collective - in the form of a general joint discussion.

For example, task: make a cluster for the word "Triangle". Students write down all the words that they associate with a given word.

First, they do this work independently, based on the knowledge that they have at the beginning of the lesson. Then they read the paragraph of the textbook "Triangle" and continue to work on compiling the cluster, this will make the cluster more complete.

This technique develops the ability to make forecasts and substantiate them, teaches the art of drawing analogies, making connections, develops the skill of simultaneously considering several options, which is so necessary when solving life problems. Promotes the development of systems thinking.

2. Reception "Cube". This technique is used at the stage of comprehension. Positive aspects of the "Cube" reception:

allows students to implement various focuses of considering a problem, topic, assignment; creates in the lesson a holistic (multifaceted) idea of the material being studied; creates conditions for constructive interpretation of the information received.

The essence of this technique. A cube is glued from thick paper. One of the following tasks is written on each side:

1. Describe it ... (Describe color, shape, size or other characteristics)
2. Compare this ... (What is it like? How is it different?)
3. Associate it ... (What does it look like?)
4. Analyze it ... (How is it done? What is it made of?)
5. Apply it ... (What can you do about it? How is it applied?)
6. Provide the pros and cons (Support or refute this)

Students are divided into groups. The teacher rolls a cube over each table and thus determines from which perspective the group will comprehend a particular topic of the lesson. Students can write written essays on their topic, can give a group presentation, and so on [6,7].

3. Reception "Sinkwine". A poem, which is a synthesis of information in a laconic form, which allows you to describe the essence of the concept or to carry out reflection on the basis of the knowledge gained". Sinkwine provides an opportunity to summarize the information received, to present complex ideas, feelings and ideas in a few words. Sinkwine can act as a means of creative expression



This form of work makes it possible to assimilate important points, objects, concepts, events of the studied material; creatively rework important concepts of the topic, creates conditions for the disclosure of the creative abilities of students.

4. "Classification". Some subjects are demonstrated in front of the class, students are invited to divide them into groups, taking into account the significant similarities and differences between these subjects. After hearing different opinions and coming to a more or less unified decision, I invite the students to get acquainted with the model and determine whether their assumptions were correct. This technique contributes to the development of attention and logical thinking, has a cognitive value.

5. "Confused logical chains". In front of the class, I demonstrate events (objects) in a deliberately broken sequence. Students are encouraged to restore the correct order of the chronological or causal chain. After hearing different opinions and, having come to a more or less unified decision, I invite the students to get acquainted with the model and determine whether their assumptions were correct. This technique contributes to the development of attention and logical thinking.

CONCLUSION

The standards of the new generation set tasks for the school: the development of students' cognitive skills, the ability to independently construct their knowledge, navigate the information space, and develop critical and creative thinking.

The formation of critical thinking in mathematics lessons, through solving a certain type of problem, in the form of exciting games, enriches the pedagogical process, makes it more meaningful, and affects the development of the child as a creative person.

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