METHODOLOGY OF FORMING CRITICAL THINKING IN STUDENTS THROUGH SOLUTION OF NON-STANDARD MATHEMATICAL TASKS IN PRIMARY EDUCATION

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Abstract: This article discusses the scientific-theoretical basis of using non-standard mathematical tasks in the formation of critical thinking skills in elementary school students.
Key words: informal education, methodology, mathematics, primary education, creativity, skills and abilities.

In our country, reforms aimed at fundamental reform of the education system, raising the quality and content of education to a new level, creating a modern mechanism for training qualified personnel, and updating educational programs and literature are being implemented gradually and systematically.

Currently, in the development of our country, students in our educational institutions, which embody the content of Eastern education, should be taught independent critical thinking, as noted by the great thinkers of the Middle Ages, Khorezmi, Farabi, and Ibn Sina, and in the process of this critical thinking, In today's globalization process, it is important to show that acquired knowledge has a great advantage compared to knowledge obtained from a certain source.

In particular, this knowledge, developed more fully and quickly, becomes the students' beliefs and is considered a tool for their thinking and active practical critical thinking. Many modern scientists, pedagogues, psychologists and methodologists are engaged in researching the issues of critical thinking. In particular, in the works of ***V.V.Davidov, M.G.Davletshin, I.Y.Lerner, A.M.Matyushkin, M.I.Mahmutov, S.Rajabov, D.Shodiyev, E.G'oziyev, A.M.Umronkhojayev***, the types of generalizations in the principles of problem-based education and their structure, educational the organization of the process is revealed, the structures of critical thinking, the specific features of individual components that determine the ways of forming generalized methods of mental activity are analyzed.

At this point, the following words of President ***Sh.M. Mirziyoyev*** come to mind: "*Critical analysis, strict discipline and personal responsibility should be the daily rules of every leader's activity."*[1]. As the head of our state said, if we teach critical analysis to our growing students from a young age, we think that these students will become mature cadres of our country in the future.

Creative sources of critical thinking go back to ancient times. In the natural and scientific works of medieval thinkers who lived in the Near and Middle East, we can see that there is a serious interest in various aspects of science, its principles, structure, criteria, and the connection of science with human intellectual development and education. The characteristic

[1] Sh.M.Mirziyoyev “Tanqidiy tahlil, qat’iy tartib-intizom va shaxsiy javobgarlik – har bir rahbar faoliyatining kundalik qoidasi bo`lishi kerak”. Mamlakatimizni 2016 yilda ijtimoiy-shtisodiy rivojlantirishning asosiy yakunlari va 2017 yilga mo‘ljallangan shtisodiy dasturning eng muhim ustuvor yo‘nalishlariga bagishlangan Vazirlar Mahkamasining kengaytirilgan majlisidagi ma’ruza. 2017-yil 14-yanvar

feature of the epistemological views of *Khorezmi, Farabi, Beruni, Ibn Sina*, their comrades and followers is that the process of abstracting the image of an object in the human mind always attracted their attention, as a result of which the concept of the essence and uniqueness of this object was developed. developed and formed.

In learning the critical thinking of students, modern didactics uses the achievements of educational psychology, which deals with mental critical thinking of students in the process of reading. The methods that serve to develop critical thinking among students in the educational system were developed within the framework of the "Reading and Writing for Critical Thinking" project implemented by the "*For Democratic Education"* consortium, and active methods of critical thinking were developed. In development, they proceed from the following foundations: What is critical thinking?

Developing critical thinking is not an easy task. It is not a task that is completed and forgotten at a certain age. At the same time, there is no perfect path to critical thinking. But there is a set of specific learning conditions that help to form critical thinkers. ***For him:***

- *to give time and opportunity to acquire the experience of critical thinking;*
- *to give students and young people an opportunity to think;*
- *acceptance of different ideas and thoughts;*
- *ensuring the activity of students in the educational process;*
- *it is necessary to convince students not to laugh;*
- *instill a sense of confidence in the ability of every student-youth to think critically;*
- *it is necessary to appreciate the emergence of critical thinking.*

One of the important components of a person's ability to think is logical literacy, that is, a certain minimum logical skills and knowledge necessary for any intellectual activity. Since logic is an integral part of mathematics, it can be assumed that if we highlight the logical concepts and actions that are available in the school mathematics course for school students, and apply the appropriate methodological treatment to them, they can form logical skills. . In any activity, attention and the ability to think logically are necessary for a person, because they help to solve problems and find a way out of difficult situations. Mathematics, as creativity, aims to develop general rules that should be applied in special cases. He who makes these rules makes them. Anyone who applies ready-made mathematical rules can create new values in other fields of knowledge. There is an opinion that mathematics requires special abilities. But the analysis of the practice of teaching mathematics shows that simple average abilities are enough for a student to learn mathematical knowledge meaningfully. Sometimes it is thought that success in mathematics is based on simple memorization. A good memory is needed, but the ability to find the most successful ways to solve different types of tasks and use visual images is more important. It is especially valuable to develop the ability to think logically, rationally and coherently. All these abilities are called solving non-standard problems in the process of creative learning of mathematics, or as they are called in various literary sources - entertaining, heuristic, creative, research, problematic, logical. In a general sense, the task is interpreted as an exercise, to solve it, according to certain information, certain actions (*calculations, movement of elements, conclusions*) are required to perform these actions in accordance with certain rules ***V.V. Drozina, V.L. Dilman*** in the book "*Mechanism of creativity for solving non-standard problems give the following definition of a non-standard task - this is a task that contains a unique, creative principle that cannot be determined by reproductive methods. solving and requires students to find their own solutions*". In the process

of solving mathematical problems, schoolchildren develop a way of thinking, in which they learn to follow a certain scheme of thinking, clearly divide into components and express their thoughts, determine the correctness of the symbolism.

Solving non-standard tasks is directly related to the creativity of a person, and the effectiveness of educational activities for the development of children's logical thinking depends on this. Mathematical skills are intensive and well-organized work. The ability to solve problems is the main tool for learning mathematics. There is no single understanding of the essence of skill in pedagogy. The analysis of scientific research shows that researchers mainly reveal the essence of skill as a set of knowledge and skills that provide the ability to perform certain activities under certain conditions. In mathematics, the skills required for solving problems and infused with creativity lead to the ability to solve non-standard problems. Solving such problems develops thinking, ingenuity, and the level of mathematical literacy increases. The effectiveness of mathematical exercises depends on the creative activity of the students, as a result of which the mental activity of the students is activated in the lesson. Tasks should stimulate, develop and improve students' thinking.

In the development of education, the school faces the problem of developing children who can think creatively, solve emerging problems using non-standard methods, and have research skills. But in the classroom, schoolchildren often perform typical tasks that contain only one solution and one solution. the only answer determined in advance based on some algorithm. Students are used to the same actions and cannot act independently. effective expansion of intellectual potential. Creativity is the ability to break away from stereotypes to create something new. In this case, great opportunities are shown by the ability of schoolchildren to solve creative tasks with an unknown solving algorithm. Such exercises are not limited by the strict boundaries of a single solution and offer an exploratory character. The search for a solution is required, and this inevitably leads to the creative work of mental activity, helps development and seems to be the most powerful means of activating cognitive activity. The organization of classes on solving atypical tasks and exercises shows that the lesson should include a number of ideas aimed not only at obtaining high-quality knowledge, but also at developing the qualities of a creative person, necessary for mastering the methods of cognitive activity .

Non-standard tasks are the subject of many local and foreign studies. They have been studied since ancient times - Egyptians, Greeks, Indians, Chinese, Arabs. The works of many scientists, mathematicians and teachers are devoted to this issue: ***L. Pizansky (Fibonacci), D. Cardano, P. Fermat, V. Leibniz, L. Euler, K. Gauss, I. Krasnopolsky, V. I. Obreimov, E. I. Ignatiev, Ya. I. Perelman, M. Gardner, G. V. Polyak, D. Poya, Yu. M. Kolyagin, L. M. Friedman***.

Examining mathematics textbooks and textbooks, we can conclude that any assignment may be atypical in some circumstances and typical in others.

After analyzing the theory and practice of teaching mathematics from the point of view of using creative tasks, we can distinguish their characteristic meaning: they teach children to find original solutions independently; has a great impact on the development of ingenuity and ingenuity, preventing and eliminating the development of clichés in solving false associations in the knowledge and skills of students, offering to find new connections in knowledge, knowledge contribute to the transfer to the mastery of various methods of cognitive activity; creating conditions for increasing students' depth of knowledge, guaranteeing a meaningful understanding of mathematical knowledge. As a result, students prepare for intellectual

development and active practical training. Solving logical problems encourages schoolchildren to think independently, helps to discover unknown talents, helps to increase confidence in their own strength and abilities, and is simply fun.

While performing logical tasks, the student observes the task and makes certain judgments and conclusions. He determines whether the reasoning is real (*true*) or false, that is, he thinks both logically and critically.

At this point, it should be mentioned that it is important to develop students' ability to think logically as well as their ability to think critically. Teaching critical thinking is the main factor in the success of students, and in the development of critical thinking in elementary mathematics classes, new pedagogical technologies and didactic games, problem questions and tasks, various pictures and puzzles are used during the lesson, and the child's age is reasonable. and using it with attention to individual characteristics depends on the pedagogical skills of the teacher. Nowadays, our teachers should be able to use digital technologies in their lessons and organize a digital educational environment in providing knowledge to students. As a result of this, the ability of students to learn independently, adapt to personal learning and work on themselves develops. International organizations trying to classify the competencies needed for modern man talk about the importance of digital, information and scientific literacy. Often these types of literacy complement each other.

The idea of critical thinking technology is that students are naturally inquisitive, eager to learn about the world, consider serious issues, and be able to put forward their own ideas. In this regard, the role of the teacher is to be a thoughtful assistant who helps students develop effective thinking skills that encourage continuous learning.

An important advantage of critical thinking is that it clarifies and exposes neglected ideas, unclear concepts, and false arguments. But its disadvantage is that it does not have creative and constructive power. Critical thinking strengthens our idea, but does not provide constructive, creative thought.

It is recommended to perform the following logical tasks with students of I-IV grades in mathematics lessons. Logical tasks of this type develop students' logical and critical thinking skills.

Task 1: *The rooster weighed 3 kg while standing on two legs. How many kilograms is a rooster when measured standing on one leg? (Answer: 3 kg).*

Task 2: *There are 9 sparrows in a row on a tree branch. The fourth sparrow flew away. How many sparrows are left on the tree branch? (Answer: 8)*

Task 3: 5 athletes participated in the 500-meter race. How far did each athlete run? (Answer: 500 m) Task 4: There are 70 pieces of paper on the table. 10 papers can be counted every 10 seconds. In this case, how many seconds will it take to count 50 papers?

Task 4: *If one stick has 2 ends, how many ends does one and a half stick have?.*

In short, various logical problems-tasks taken from life will bring pleasure to the student. The student looks for ways to solve the task. Such tasks not only strengthen the student's mathematical knowledge and skills, but also develop his logical thinking, encourage the student to search, be resourceful, and strive for the goal.

Such logical assignments are often found in textbooks. They greatly help students to focus on the lesson and improve their creative activities.

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