

USE OF CRITICAL THINKING TECHNOLOGIES IN TEACHING MATHEMATICAL DISCIPLINES

In today's world, where technology is changing rapidly and competence in technical sciences is essential for a successful career, it is important for students not only to acquire specific knowledge but also to develop analytical and critical thinking. The use of critical thinking technologies in teaching mathematical disciplines is becoming a necessity for the formation of professionals capable of independent analysis, solving complex problems and innovative thinking.

Critical thinking is the ability to think, analyse and understand information, compare facts, make independent judgements and make decisions based on good judgement. A teacher who tries to work creatively, understands the problems of his or her students, should be able to orientate them to critical reflection on any task, their role in solving it and their own competence [6].

The idea of developing critical thinking originated in the United States, in the work of the famous American psychologist of the twentieth century, J. Dewey. Dewey was a significant figure in the philosophy of pragmatism and the founder of functional psychology, a proponent of educational progressivism. He is credited with the statement that the fundamental purpose of modern education is not just to provide information, but to develop a critical way of thinking. Education is oriented towards the future, which cannot be predetermined, and therefore, the priority is to develop the type of thinking that allows for an adequate assessment of new circumstances and the formation of strategies to overcome problems that may arise [5, p. 4].

The founder of the Institute for Critical Thinking, Matthew Lipman, defined critical thinking as skilled, responsible thinking that makes good judgements because it is based on criteria, corrects itself and takes into account context [4, p.4].

In Ukraine, interest in the development of critical thinking as an educational innovation emerged at the end of the twentieth century. Thus, a number of Ukrainian scholars pay considerable attention to the study of critical thinking: I. Bondarchuk, T. Voropai, O. Pometun, S. Terno, O. Tyaglo, L. Terletska and others. The idea

of developing critical thinking is quite new for Ukrainian didactics and teaching methods [3, p. 3].

Today, it is clear that critical thinking does not mean negative judgements or criticism, but rather a reasonable consideration of a variety of approaches to make informed judgements and decisions. Therefore, according to the famous American psychologist D. Halpern, future-oriented education should ensure that students develop two main groups of skills: the ability to quickly navigate the growing flow of information and find the right information, and the ability to comprehend and apply the information acquired [4, p.4].

In this regard, the task of education is not only to give the student a certain set of knowledge, but also to teach the student to learn, to activate mental activity, to use intuitive, associative and logical thinking to find new atypical ways of solving practical problems, i.e. to teach to work, to teach to coexist, to teach to live.

When studying any phenomenon, the student must learn to break it down into simple elements and build logical sequences. This will allow you to create algorithms, which means correct programmes describing a certain process, break down the whole into small parts, describe each element and, once assembled, get the whole again. The ability to think logically is especially important here. Intuition, life experience, and logic allow you to rationally combine blocks of programmes.

An essential skill for students is the ability to distinguish between cause and effect. As Aristotle said: «In order to study, one must organise». We can consider any phenomenon in terms of cause-and-effect relationships, using the mathematical apparatus correctly, and describe it in blocks, having previously set a logical sequence of events and processes [2, p. 14].

For example, when analysing a chain of textual tasks in mathematics. Solving textual problems in mathematics is the most important means of developing students' basic cognitive activities and stimulating their creativity. By solving such tasks, students learn to analyse a life situation, reason, find a solution strategy, and critically evaluate the result.

For more than a hundred years, scientists have been studying the process of human problem solving. The well-known psychologist S. L. Rubinstein characterised problem solving as a process of reformulation, in which the conditions and requirements of the problem are continuously analysed through a synthetic act of correlation [1, p. 48]. When solving textual tasks, students have serious difficulties

in isolating the quantities related to each other by any dependencies, giving a mathematical interpretation of the verbal description of this dependency, or even finding it in the text of the task. To solve this problem, critical thinking techniques can help, as they focus on problem formulation and search for a solution and are carried out in three stages: challenge, comprehension and reflection.

The impact of critical thinking in mathematics cannot be overstated. This key skill helps students to delve deeper into mathematical concepts, to look at them from different perspectives and understand their true meaning, to learn not only how to solve specific problems, but also why these methods work and when they should be used. They learn to evaluate different approaches and choose the most effective one. Critical thinking helps to analyse mathematical statements, check their logical consistency and look for possible errors or flaws, and as a result, build more reasonable solutions and conclusions. Students learn to ask questions and check evidence to make sure a statement is correct or to identify its weaknesses.

So, critical thinking plays a key role in the study of mathematical disciplines, promoting a deep understanding of the material and developing analytical skills that are essential for success in the world of modern technology and scientific research.

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