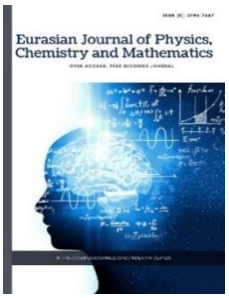

Mathematical Thinking and Mathematical Ability and Their Development

Otojanova N.B. Chirchik State Pedagogical University
Sapayeva D. Chirchik State Pedagogical University

ABSTRACT

In this article, mathematical thinking and mathematical character and the features of their development are revealed.

Keywords: student, mathematical thinking, mathematical ability, development, methodology.

The process of advancing scientific knowledge leads to the penetration of technology into all spheres of life, the mathematization of not only various fields of science, but also the majority of practical specialties. The dynamics of the development of society is such that the part of the population related to mental work is continuously growing. The use of technology in every field Due to its expansion, man is freed from hard physical labor in many professions.

One of the most characteristic features of modern times is the growing need for middle and highly qualified mathematicians. If 30-40 years ago, mathematics was able to apply its power only in schools or universities, now the doors of research centers in the fields of commerce, transport, medicine, biology, and pedagogy are wide open in front of them and their electronic assistants. The importance of in-depth education in the specialties themselves is increasing, the ability to pose new problems and foresee the course of their solution is increasing. The importance of mathematics for the development of logical thinking has been known since ancient times. When we talk about the mathematical style of thinking, which should be known by specialists of any specialty, we understand the high qualities of logical thinking, brevity, order even if it is small, avoiding falsification, giving a complete proof, etc. people can say that most of these abilities develop in the process of learning language, literature, history, etc. Every subject should develop the intellectual power of the students. However, in the formation of logical thinking, mathematics is definitely of the first importance, because it cannot be coherent with false claims, it does not make verbal thinking look like reality. ra is one of the rare subjects that prefer to refuse, that's why the responsibility of the mathematics teacher before the society is very big, after all, the style of thinking depends on the style of teaching in many ways.

When the famous mathematician and pedagogue A.Y. Khinshin talks to parents and students about the culture of mathematical thinking, you often hear the answer: "He has no ability in mathematics." What is mathematical ability? Can it be developed? Mathematical skills are as follows.

1. The ability to calculate (algorithmize), it is characterized by the ability to change complex algebraic forms.
2. The ability to think logically is the art of logical reasoning that is coherent and correctly divided into parts.

3. Spatial imagination or geometric intuition Different applications of mathematics do not require the same development of these abilities: in one field it is more important to find a good algorithm for calculation, but for other fields it is important to know logical thinking.

Therefore, the teacher should open a wide way for students to develop their daily math skills. The following main components are distinguished in the structure of mathematical abilities.

1. Forming and perceiving mathematical material, that is, being able to quickly perceive its mathematical form in a specific problem.
2. Mathematical objects, ratios and actions to generalize quickly and widely.
3. Condensing the process of mathematical reasoning and the system of related actions, that is, leaving some intermediate groups of reasoning as self-evident assumptions.
4. The feeling of the thinking process when solving mathematical problems.
5. The ability to quickly switch from right thinking to wrong thinking.
6. Trying to save mental stress in a unique way - trying to solve mathematical problems in a clear, rational way.
7. Mathematical memory

These qualities were absent from students whom the teachers considered incapable of mathematics. Two points should be considered. Therefore, it is not appropriate to make judgments about a student's abilities with great confidence based on his academic success.

Let's remember that inventor Edison, philosopher Hegel, mathematician Luzin were declared "incompetent" during their studies. This (fact) should be a constant warning to teachers who are quick to declare some of their students as gifted or gifted. English educator Doris M. Lee, after teaching 100 boys and girls for five years, compared their math skills and their learning in math. , the development of these abilities was caused only by the teachers' lack of interest in training.

Second, by making the program materials accessible to all students, any incompetence in mathematics can be eliminated. Here it is about developing the above-mentioned abilities in students.

In order to solve this problem, it is not appropriate to adapt the entire educational work in the class to the "average" student. This will harm both gifted and gifted students. Obviously, along with group work in the classroom, independent work with students should be given sufficient importance. In this case, it is necessary to work according to the strong or weak aspects of their thinking. It follows from this that in the didactic materials related to mathematics (handouts, notebooks), it is necessary to consider not only the mastering of the program materials, but also the development of special mathematical abilities. More precisely, mathematical ability and thinking should be developed during the study of all sections of the school course in mathematics, in this case, special attention should be paid to understanding the methods of mathematical achievement, related research, trial and error, and mental work. forced to give. All methods of the teacher's work should be based on these rules. Developing teachers' creativity in learning mathematics is the key to unlocking their mathematical and mental abilities at the school level. This is how they create the effect of mathematical thinking.

References:

1. A.I.Markushevich, Празднование 250-летия со дня рождении Эйлера, Математика, ее преподавание, приложения и история, Mat. Pros., Ser. 2, **2**, 1957, 235–240
2. N.B.Otajonova, D.B.Otajonova The role of differential equations physical exercise, Journal Pedagogy & Psychology Theory and Practice, 2020, № 4(30), pp.26-30
3. N.B.Otajonova Application of integrals in exact sciences, Pedagogy & Psychology Theory and Practice, 2021, № 2(34), pp.20-23
4. N.B.Otojonova Cluster method in organizing mathematics lessons // Scientific progress, 2021, volume 2, issue 2, pp.64-66