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NEW METHODOLOGICAL METHODS AND INNOVATIVE TECHNOLOGIES IN TEACHING MATHEMATICS

Shakhzoda Ishnazarova Ruzievna
Teacher of mathematics at the 15th comprehensive school of Termez, Surkhandarya region

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ABSTRACT

Mathematics is not about numbers, equations, computationsor algorithms: it is about Understanding. The history of methodology of mathematical science, their types and the use of modern advanced technological methods are covered.

The word mathematics is derived from the ancient Greek word mathema, which means "knowledge of science." The object of mathematical science is the spatial forms of things in matter and the quantitative relationships between them. At present, the science of mathematics is conventionally divided into two: 1)elementary mathematics, 2) higher mathematics.

Elementary mathematics is also an independent science which is based on elementary data from various branches of higher mathematics, namely theoretical arithmetic, number theory, higher algebra, mathematical analysis, and the logical course of geometry.

Higher mathematics is the spatial forms of the real world and they are which fully and deeply reflects the quantitative relationship between is concerned with finding mathematical laws.

Mathematical methodology answers the following three questions related to the educational process:

1. Why study mathematics?
2. What should you learn in mathematics?
3. How to study mathematics?

History of math metodology

The concept of mathematical methodology was first described in the 1803 Visual Study of Numbers by the Swiss educator and mathematician G. Pestalozzi. From the first half of the seventeenth century, academician S.E. Gurev (1760-1813), and from the first and second half of the eighteenth century N.I. Lobachevskiy (1792—1856), I.N. Ulyanov (1831-1886). L.N. Tolstoy (1828—1910) and the famous Methodist mathematician S.I. Shokhor-Trotsky (1853—1923), A.N. Ostrogradsky and others practiced and developed the

progressive foundations of mathematics from a scientific point of view.

The school, which is based on the current curriculum, uses V.M. Kolyagin, R.S. Cherkasov, P.M. Erdniyev, J. Ikramov, N. G. Aybullayev, T. Tulaganov, A. Abdukodirov and other Methodist scholars have studied and are practicing. Methods of teaching mathematics are taught in the III-IV courses of pedagogical universities. It is conventionally divided into three parts according to its structure.

1. General methods of teaching mathematics. In this section the purpose, content, form, methods of mathematical science and methodical system of its means, laws of pedagogy, psychology and based on didactic principles.
2. Special methods of teaching mathematics. This section shows how to apply the laws and rules of general mathematics teaching methods to specific subject materials.
3. A clear methodology for teaching mathematics.

This section consists of two parts:

- Special issues of general methodology.
- Private issues of special methodology.

For example, planning and doing math lessons in 6th grade is a special case of the general methodology.

Methods of teaching mathematics

In modern didactics, including the subject of mathematics teaching methods, problems of the method of teaching are generally solved, which is characterized by the following two aspects:

a) teaching (teacher activity);

b) learning (students' conscious cognitive activity)

The methods of teaching in a school mathematics course can be classified as follows.

1. Methods of scientific research (observation, experiment, comparison, analysis and synthesis, generalization, abstraction and classification).
2. Teaching methods (heuristic method, programmed learning method, problem-based learning method, lecture and conversation methods).
3. Inference methods (induction, deduction and analogy).

Research methods in mathematics teaching

It is known that the object of study of mathematics is matter spatial forms of things and the quantitative relationships between them. In the process of determining the quantitative relationships between these forms, mathematicians use scientific methods of research as a tool.

Scientific methods of research in mathematics are at the same time

and the role of research methods in the teaching of mathematics

does Research methods in teaching include:

1.Experiment and observe. 2. Comparison. 3. Analysis and synthesis. 4. Generalization. 5. Abstraction. 6. Identification. 7. Classification.

Experimental and observational method

Definition: The method of determining the properties of objects in a mathematical object and their relationship is called observation.

For example. If we show students in grades IV-V and tell them to distinguish geometric figures with axis symmetry from these figures, students can look at all the figures and come to the following conclusion. If there are figures in a figure that are divided into two parts by an axis, and that is the

same axis if the parts overlap when folded along, such figures will be symmetrical figures. But other figures may not have straight lines dividing themselves into two equal parts. In that case, such figures will be symmetrical figures. We divided the figures into symmetrical and asymmetrical figures by observing such a property in the figures and the relationships between them.

Definition. The experimental method is the process of artificially dividing or combining the properties of objects in a mathematical object and the quantitative relationships between them. For example. Students are taught to divide natural numbers into prime factors.

Method of comparison

Definition. The method of determining the similarities and differences between objects in a mathematical object is called the comparison method. The method of comparison is also one of the methods of scientific research.

The following principles apply to the application of the method of comparison to the subject matter studied in mathematics:

1) the mathematical concepts being compared must be homogeneous;

2) comparison of objects in the mathematical object under study should be relative to the basic properties.

Generalization method

The concept of generalization is also one of the research methods in mathematics teaching. The importance of the generalization method was emphasized by the eminent scholar A.N. Kondakov describes it as follows. "Generalization is such a logical method that it is used to move from unit thinking to general thinking."

The concept of generalization is applied in the school mathematics course as follows:

1) generalization of mathematical concepts;

2) generalization in proving theorems;

3) generalization of examples and problem solving.

Generalization applications will now be considered separately.

Abstraction method

One of the methods of scientific research in teaching is abstraction. Abstraction is a process of thinking, which consists in the mental separation of important features, qualities or properties of things in the object under study and the transformation of this sign, quality or properties into an independent object of thought.

Classification method

Definition. The transition from gender to species is called classification. In the process of classification, students try to unite them into a class based on a sign (important or similar), that is, to separate them according to their similarities, commonalities and differences, as a result of which they classify concepts.

Heuristic teaching method

The word "heuristics" means to find based on questions and answers. Heuristic teaching has been used in schools since the early 19th century. Well-known pedagogue-mathematician SI Shokhor-Trotsky writes in his book "Geometry on the task": task should be of a character that activates their mental activities, not for dry memorization.

Innovative technologies

The use of innovative technologies in practical classes also requires great skill and knowledge from the teacher. The goal can be achieved if innovative technology is used in its place. Depending on the topic of the lesson, the teacher can use high technology to achieve high results.

"Classic Couples" ("Classic Trinity") - participants are handed out small cards with printed or printed concepts on them that have a classic or well-known connection to each other, the names of people, the names of fairy tale and folklore heroes.

Pair-by-pair communication - Assigning a task (or individual assignments) to students sitting side by side on a topic and encouraging them to work together to find a solution to a problem (issue), listening to and evaluating solutions. In some cases, students may take turns asking each other questions. In this case, the answer (problem solution) must be listened to (checked) and evaluated by the student who asked the question (problem).

In conclusion, today's students need to be educated in accordance with modern requirements. After all, in the age of new technologies, boys and girls are born with a number of common qualities. At a time when our lifestyles, interests and desires are becoming almost identical in the global space, the goal cannot be achieved with yesterday's teaching methods. Only when we keep pace with the times will we be able to bring up a highly intelligent generation. The introduction of innovative technologies in the educational process can increase the effectiveness of education and a technological approach to the educational process.

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