INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE



ISSN: 2692-5206, Impact Factor: 12,23 American Academic publishers, volume 05, issue 01,2025



Journal: https://www.academicpublishers.org/journals/index.php/ijai

MODERN TECHNOLOGIES AND METHODS OF TEACHING MATHEMATICS

Adilov Boburjon Bakhridin oʻgʻli Jizzakh Polytechnic Institute Phd, Associate professor.

Annotation: this article reflects on the modern technologies and methods of teaching mathematics.

Keywords:reproductive, heuristic (educational Discovery), Problem situation, research, project method, study of specific situations (case-stage) method, Report, story, explanation, conversation methods.

The word method is a Greek word meaning "to guide". The concept of the method of education, on the other hand, is one of the main concepts of the modern method and in the didactic sciences, but until recently this concept was used in various methodological literature with different content.

In modern didactics, including the subject of mathematics teaching methodology, the problems of the educational method are solved in general, which is characterized by its following two sides.

The methods of education in the school mathematics course can be classified as follows.

1. Methods of scientific research (observation, experimental comparison, analysis and synthesis, generalization, abstraction concretization and classification).

2. Teaching methods (heuristic method, programmed learning method, problem learning method, lecture and conversation methods).

3. Methods of inference (induction deduction and analysis).

Scientific research and research methods in teaching mathematics.

As we know, the object that mathematics studies consists of the spatial forms of things in matter and the quantitative relationships between them. In the process of determining quantitative relationships between these forms, mathematicians use scientific methods of research as tools. Research in mathematics its scientific methods also act as scientific research methods in teaching mathematics at the same time. Scientific research methods in teaching include:

- 1. Experience and observation.
- 2. Compare
- 3. Analysis and synthesis
- 4. Generalization
- 5. Abstraction
- 6. Concretization.
- 7. Classification.

Experience and observation techniques.

Mathematics is called method observation, which determines the properties of things in the object and their relationship.

The task of teaching mathematics and a mathematics teacher is to instill in the student a feeling of striving for independent conclusions.

Example. By showing how many figures students in V–VI have, and ordering them to separate geometric figures with axial symmetry from within these figures, students can look at

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE



ISSN: 2692-5206, Impact Factor: 12,23 American Academic publishers, volume 05, issue 01,2025



Journal: https://www.academicpublishers.org/journals/index.php/ijai

all the figures and conclude as follows. Such figures are called symmetrical figures if there are figures inside the figures that are separated into two parts in relation to any axis in them, and when they fold them according to this axis, their parts fall over them. But from other figures there may not be straight lines that divide themselves into equal halves. Then such figures are called symmetrical figures. We separated these figures by observing their symmetry and symmetry.

The properties of things in a mathematical object and the quantitative relationships between them are called the experimental method of artificial separation into fragments (parts)or their unification.

Example. Students are taught to factor natural numbers into prime factors.

1=1 2=2×1 3=3×1....

After the arbitrary natural numbers are shown in the example in the readers, an experiment is generated in the process of prime factorization. Experimentally check that complex natural numbers are also prime factors, but that their factors are at least three or more.

 $25 = 5 \times 5 \times 1 \qquad 36 = 3 \times 3 \times 2 \times 2 \times 1$

Comparison method.

The method that determines the similarities and differences of things in the studied mathematical object is called the comparison method.

When applying the comparison method to the materials of the subject being studied in mathematics lessons, they follow the principles as follows:

1. The mathematical concepts being compared must be same-sex.

2. The math in which the comparison is being studied should be relative to the basic properties of things in the object.

Example. When comparing a rectangular figure with a triangular figure, they have similar sides: tips, corners, their differences.

A). Three sides and three sides in a triangle.

B). The quadrilateral consists of four ends and four sides.

In this example, the two principles of comparison were also fulfilled, that is, the triangular and rectangular figures are same-sex concepts, both of which are polygonal private cases, and the comparison method is carried out with respect to the basic properties of both figures.

Analysis and synthesis method.

Definition. The method of searching from the unknown to the known is called analysis.

When thinking through the analysis method, the reader must answer the following question. What he needs to know so that he knows the unknown being sought.

Definition. The method of searching from the known to the unknown is called synthesis.

The synthesis method answers the question of what we can find based on what is given.

Generalization method.

The concept of generalization is also one of the methods of scientific research in the teaching of mathematics and is calculated. Generalization it consists in separating the generally important themes of the objects under study from their non-essential aspects.

Generalization is such a logical method that, through its means, the transition from unit thinking to general thinking.

In the school mathematics course, the concept of generalization is applied as follows.

- 1. Generalization of mathematical concepts.
- 2. Generalization in theorem proving
- 3. Example and generalization in solving problems.



ISSN: 2692-5206, Impact Factor: 12,23 American Academic publishers, volume 05, issue 01,2025



Journal: https://www.academicpublishers.org/journals/index.php/ijai

Abstraction method.

One of the methods of scientific research in the teaching process is abstraction.

Abstraction quality of important signs of things in the object under study

or it is a contemplative operation that consists in the transformation of that character, quality or characteristics into an independent object of thought, by distinguishing the characteristics from the thought.

Concretization method.

Thinking in a one-sided private case of the properties of things in the object under study is called concretization.

 $a^2 - b^2 = (a - b)(a + b)$

 $81^2 - 63^2 = (81 - 63)(81 + 63) = 18 \times 144$

Classification method.

The transition from the concept of gender to the concepts of species makes the concept classification is called.

For example: dividing triangles into types according to their angles or sides;

Quadrangle classification;

In the process of classification, students, based on a (significant or similar) character, are motivated to combine them into one class, that is, they separate them from each other according to their similar, general and farcical sides, as a result of which they classify their concepts.

For example, the classification of the concept of a polygon is done as follows.

Methods for drawing conclusions in teaching mathematics

Mathematical inference is also one of the forms of logical thinking. The mathematical conclusion is given such a definition.

The third consequential judgment generated from two strict judgments is called a conclusion. Example. 1st judgment: the diagonal of a rectangle divides it into two triangles.

Judgment 2: the sum of the inner angles of each triangle is 1800.

Judgment 3: so the sum of the rectangular inner corners is 3600 (there will be a conclusion).

In the school mathematics course, three nets of conclusions are studied, namely inductive, deductive and analogical ones.

Relying on individual or private information to draw a general conclusion is called induction. Induction is of three types.

1. Incomplete induction

2. Full induction

3. Mathematical induction

The conclusion made among the incomplete induction method is true in most cases, but incorrect in some cases.

Example. By the well-known theorem of Ferma, the $(2^2 + 1)$ representation numbers $n=\{0,1,2,3,4,....\}$ was composed of tuples such as 3,5,17,257,6553,7. Therefore, Ferma made a general conclusion that in the general case $(2^2 + 1)$ all numbers in sight will also be prime numbers in arbitrary values of N. In the 18th century, L. Eyler investigated the farm theorem and found that its law violates when n=5, that is, the resulting number is a complex number.

 $2^5 + 1 = 4294967297 = 641 \times 6700417$

It is divided into (25 + 1) expressions 641. It follows that this number is not a prime, but a complex number.

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE



ISSN: 2692-5206, Impact Factor: 12,23 American Academic publishers, volume 05, issue 01,2025



Journal: https://www.academicpublishers.org/journals/index.php/ijai

In contrast, inference by the induction method is assumed to be appropriate for Case n since some mathematical law is appropriate for case three.

An example of this is the formula for finding the desired Hadi of arithmetic progression. Drawing some or private conclusions based on general information is called deduction.

Example. $x^2 + 3x-4 = 0$ calculating the discriminant of the equation, show that it has solutions.

D=9+16=25 D>0 is known to us that if the discremenant of the quadratic equation is positive, it will have two real xar solutions.

REFERENCES:

- 1. Yunusova D.I. Ta'lim texnologiyalari asosida matematik ta'limni tashkil etish. T., "Universitet", 2005, 131 b.
- 2. R.P. Pathak. Methodology of Educational Research. Atlantic. USA-2008.
- 3. Adilov B.B. Monoton ketma-ketliklar va ularning limiti tushunchasi // Buxoro davlat universiteti ilmiy axboroti. -6/2024
- 4. Adilov B.B. O'lchovli funksiyalar ketma-ketliklarining yaqinlashishlari // Namangan davlat universiteti ilmiy axboroti. 4–son 2024y.
- 5. Bakhridinovich A. B. Theoretical bases of formation of design-design competence of future engineers in the process of higher education. 2022.
- Adilov B. ORGANIZATIONAL AND PEDAGOGICAL FOUNDATIONS OF THE FORMATION OF PROJECT-DESIGN COMPETENCE OF STUDENTS OF THE ENGINEERING DIRECTION //Science and innovation. – 2022. – T. 1. – №. B4. – C. 318-322.