

METHODOLOGY OF TEACHING MATHEMATICS

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Abstract

Everyone who has knowledge can teach it to others. They teach according to their abilities. To choose the right teaching and learning strategies for a mathematics topic, you need to be aware of various approaches and teaching methods. We explain the distinction between teaching approaches, methods, and techniques as follows.

Keywords: Spiral Approach, Inductive Approach, Deductive Approach, Formal Approach, Competency-Based Approach, Synthetic Approach, Intuitive Approach.

Introduction

МАТЕМАТИКА О'QITISH METODIKASI

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Annotatsiya:

Bilimga ega bo'lgan har bir kishi uni boshqalarga o'rgatishi mumkin. U o'z qobiliyatiga ko'ra ta'lim beradi. Matematikaning mavzusi uchun to'g'ri o'qitish va o'qitish strategiyasini tanlash uchun siz turli xil yondashuvlar va o'qitish usullarini bilishingiz kerak. O'qitish yondashuvi, usullari va texnikasi nimani anglatishini farqlash uchun biz quyidagicha izohlaymiz:

Kalit so'zlar: Spiral Yondashuv, Induktiv Yondashuv, Deduktiv Yondashuv, Rasmiy Yondashuv, Kompetensiyaviy yondashuv, Sintetik Yondashuv, Intuitiv Yondashuv.

МЕТОДИКА ПРЕПОДАВАНИЯ МАТЕМАТИКИ

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Аннотация:

Любой, кто обладает знаниями, может научить их другим. Он обучает в соответствии со своими способностями. Чтобы выбрать правильную стратегию преподавания и обучения для предмета математики, вам необходимо знать различные подходы и методы преподавания. Чтобы различать, что означают подход, методы и методы обучения, мы интерпретируем:

Ключевые слова: Спиральный подход, индуктивный подход, дедуктивный подход, формальный подход, компетентностный подход, синтетический подход, интуитивный подход.

Introduction

"Mathematics teaching methodology" (Mathematics teaching methodology) means a set of methods and strategies used in the process of teaching and learning mathematics. There are several main aspects and approaches in this area:

1. Preparation of educational material: Preparation of textbooks, manuals and additional resources.
2. Teaching methods:
 - Traditional approach: Teacher speaking and students participating in writing.
 - Interactive approach: Encourage students to actively participate and discuss.
 - Problem-based learning: Leading students to solve problems.
3. Educational technologies: Use of digital educational materials, programs and online platforms.
4. Differentiated learning: Personalizing lessons to meet the needs of different learners.
5. Assessment methods: Methods of assessing students' knowledge and skills, including tests, projects and practical work.
6. Psychological foundations of teaching: Development of students' motivation, attention and listening skills.

Mathematics teaching methodology is constantly updated and develops based on modern requirements and scientific research.

Teaching methods are methods that can be used to work on each lesson material. For example, the lecture method, the question-and-answer method, and the discovery method. To do this, the teacher does not need to have special skills or special talent.

A teaching technique is a teaching method that requires special skills or talents. For example, teaching the formula for the roots of a quadratic equation requires the teacher to have some mathematical knowledge or ability before the teaching is done properly and the learning objectives are met.

It can be a teaching approach and a concept or procedure used in discussing the lesson material to achieve the learning objectives.

1. Spiral Approach

Modern mathematics teaching follows a spiral approach. This approach is used to teach concepts. With a spiral approach, a concept is not taught in an interval from beginning to end, but is taught in several discrete intervals. Thus, a spiral approach is a process of discussing concepts that begin simply, from intuition to analysis, from discovery (investigation) to mastery, over a very long period of time, from the lowest level, in discrete intervals.

2. Inductive approach

Reasoning is the process of thinking to make a conclusion. General conclusions can be drawn from individual cases. But it can be the opposite, from general things to individual cases. The



reasoning process of drawing the above conclusions is called sequential inductive reasoning and deductive reasoning. Knowledge can be gained through intelligence or experience. Inductive reasoning is used to obtain intellectual knowledge and deductive reasoning is used to obtain experimental (empirical) knowledge. In the introduction, the idea that there are flaws is made through experience and observation. Therefore, only complete induction or mathematical induction is used in formal mathematics. Conclusions drawn using this complete induction are generally valid.

3. Deductive Approach

A deductive approach is a method of logical reasoning in which specific conclusions are drawn based on general rules and theories. In this approach, after obtaining previous information or principles (general), based on this information, conclusions are drawn for specific cases (specific).

The basic process of the deductive approach is as follows:

1. Identifying a general principle or rule: Identifying a general rule through existing knowledge or theories.
2. Case Study: The study of a particular case or example that embodies or illustrates this rule.
3. Analysis and conclusion: Combining the general rule and the special case to arrive at a definite conclusion or result.

The deductive approach is widely used in the systematic study of knowledge, testing theories, and applying general rules to practice.

4. Formal Approach

A formal approach allows expressing precise and rigorous concepts in mathematical language, and this, in turn, is important in the development of mathematical theories and methods.

Before modern mathematics curriculums existed, geometry was taught formally deductively in middle and high schools. The deductive method fits the system. A formal system begins with elements or terms and teaches a set of basic assumptions or axioms that are information about those elements. Definitions or theorems in a system have logical consequences. If it is proven, then the proposition or feature is generally valid in the system. There will be no conflicts in the system. That is why mathematics is called a deductive science.

5. Competency approach

Education based on the competence approach is characterized by the preparation of students to use the acquired information in standard and non-standard situations of educational and life activities.

6. Analytical approach

The analytical approach plays an important role in mathematics and scientific research. This approach works on the basis of more precise formulas and calculations, approaches the issues in a deep and systematic way.



Discussion of learning materials can start from the unknown to the already known, or vice versa, from the production of the known. When the process is derived from something that is not yet known, it is said to use an analytical approach. The opposite is the synthetic approach. In an analytical approach, the problem to be solved must be broken down until the relationship between the parts that are not yet known and those that are already known is clear. Starting from an unknown step, further steps are sought that connect the unknown with the known, such a sequence of steps will eventually yield the desired object.

Advantage: This analytical approach is logical and reliable approach. Each step is always justified until an understanding is reached.

Disadvantage: not all course materials can be taught with an analytical approach, sometimes discussion with an analytical approach requires a long procedure.

7. Synthetic Approach

The synthetic approach is an approach aimed at studying objects and phenomena in mathematics in an interconnected form, based on general principles. In this approach, logical and intuitive thinking is very important and is widely used in proving mathematical theorems and solving problems. A synthetic approach is a discussion of the known and the unknown. The steps are carried out successively by connecting the known with other necessary and unknown things of the problem, until finally the unsought things can be found.

The advantages are: the synthetic approach is a logical approach, often the discussion with the synthetic approach is shorter than the analytical method, and the use of a combination of synthetic and analytical approaches reduces the weaknesses of the analytical approach.

Disadvantage: the synthetic approach does not guarantee that the student will understand the studied material. A true student solves a given problem correctly, perhaps because he knows the steps by heart, which he has no idea about. If so, memorizing the steps to solve various problems becomes an increasingly burdensome Intuitive Approach.

8. Intuitive approach

Intuition is a source of knowledge along with reason and experience. Intuitive approach is another form of inductive approach. Teaching mathematics with an intuitive and inductive approach differs only in its examples. Intuitive examples are usually in the form of games, interesting everyday situations, or problems involving mathematical concepts being taught.

The intuitive approach has found its place in mathematics education because it allows students to be more creative and individual. This approach can be particularly useful when mathematical concepts are unconventional or when students do not understand complex formulas and calculations.

The advantages are: learning is more interesting for students, because they are introduced through examples of everyday situations in their lives.

The downside is that it takes more time.

Mathematics Teaching Methodology

1. The Lecture Method is the most commonly used teaching method, especially for non-specific fields of study. This may be considered the easiest way to do by teachers. If the lesson material



is mastered and the delivery method is determined, the teacher should only present it in front of the class. Students listen to the teacher's speech, try to catch things and take notes.

Advantages:

- * Every student has the same opportunity to listen.
- * Lesson materials or information can be given more sequentially by the teacher.
- * Curriculum content can be followed more easily because the teacher does not have to adapt to the student's reading speed.
- * The lack or absence of textbooks and study guides does not prevent the implementation of classes with lectures.

Weakness:

- * Lessons become boring, students become passive because they do not have the opportunity to discover the concepts taught for themselves.
- * Students only write notes.
- * Too many concepts given may lead to students not being able to master the taught material.
- * Knowledge gained through lectures is quickly forgotten.
- * Lectures cause students to learn by rote, which does not lead to understanding.

Mathematics is a science that requires prerequisites for understanding. Therefore, if you want to use the lecture method to teach mathematics, the following points should be taken into account:

A. speech method should be used when:

- 1) aimed at providing information
- 2) the presented material is not available in other sources
- 3) the presentation material is adapted to the abilities of the group receiving it

B. speech method is not used when:

- 1) the purpose of teaching is not only to provide information, but also, for example, to make students creative, skilled or related to higher cognitive aspects.
- 2) long-term memory is required.
- 3) active participation of students is required to achieve educational goals.

REFERENCES:

1. Bozorova, O. H. (2023). DEKART KOORDINATALARI SISTEMASI VA SFERIK KOORDINATALI SISTEMASI ORASIDAGI BOG‘LANISH. Экономика и социум, (12 (115)-2), 87-90.
2. Qutlimurodov, A. R. (2021). GEOMETRIK ALMASHTIRISHLAR. Academic research in educational sciences, 2(5), 1497-1501.
3. Qutlimurodov, A. R., & Bozorova, O. H. Q. (2021). Parallel Ko‘chirishlar. Academic research in educational sciences, 2(CSPI conference 1), 507-511.
4. Haydarova, Z. N. (2024). Ta‘limda raqamli savodxonlikni shakllantirishning pedagogik imkoniyatlari. Raqamli transformatsiya, 1(1), 502-512.
5. Фаизова, Ф. Ш. (2021). Вопросы изучения статейных списков. НЗ4 Наука и инновации в XXI веке: Материалы Международной, 126.



6. Muxamedova, G. R., & Taymanova, E. L. (2024). Algebra va sonlar nazariyasini o'qitishda sun'iy intellekt imkoniyatlaridan foydalanish. *Science and innovation*, 3(Special Issue 18), 659-664.
7. Lutfullayevna, T. E. (2024). Algebra va sonlar nazariyasi va matematik analiz fanlarida talabalarning mustaqil ta'lim olish samaradorligini oshirishda math. Df dasturi imkoniyatlaridan foydalanish. *Science and innovation*, 3(Special Issue 32), 396-401.
8. Xamidova, M. (2024). Ta'lim sifatini oshirishda innovatsion texnologiyalarni o'rni. *Innovatsion va raqamli texnologiyalar*, 1(1), 942-944.
9. Kenjaboyeva, M. H. (2021). Zinapoyasimon graflarda to'lqin tarqalish tenglamasi uchun boshlang'ich-chegaraviy masala yechimining yagonaligi haqidagi teorema. *DIFFERENTIAL EQUATIONS*, 1(1), 165-166.
10. Kenjaboyeva, M. H. (2021). Zinapoyasimon graflarda to'lqin tarqalish tenglamasi uchun boshlang'ich-chegaraviy masala yechimining yagonaligi haqidagi teorema. *BuxDU*, 1(1), 1-2.
11. Kenjaboyeva, M. H. (2021). Zinapoyasimon graflarda to'lqin tarqalish tenglamasi uchun boshlang'ich-chegaraviy masala. *Modern problems of mathematical physics*, 1(1), 334-335.
12. Davidov, Y. J. (2023). The Phenomenon of Polysemy and Different Aspects of Conversion.
13. Davidov, Y. J. (2022). Ko'p ma'nolilik hodisasining yuzaga kelish yo'llari. *Science and innovation*, 1(B2), 500-503.
14. Omonova, M. (2023). O'qituvchi pedagogik tafakkurining mohiyati va tavsifi. *Fan Ta'lim va Innovatsiya*, 1(2), 426-428.
15. Muxlisa, O., & Mukhamadiev, A. (2024). Similarities and differences of aspects in english and Uzbek languages. *Лучшие интеллектуальные исследования*, 21(4), 17-20.
16. Yunusova, X. (2024). Ta'lim tizimi uchun pedagoglarni tayyorlash-dolzarb muammo sifatida. Ta'lim va innovatsion tadqiqotlar, 1(3), 245-248.
17. Alimov, B. N. (2023). Markaziy Osiyolik ilk renessans davri buyuk olimlarining matematik merosi. *Muammo va yechimlar*, 1(1), 59-62.
18. Алимов, Б. (2023). Параболик сегмент юзини ҳисоблаш тарихидан. *Замонавий педагогика*, 1(1), 12-14.
19. Navruzov, U. B. (2024). Matnli masalalarni tenglama tuzish yo'li bilan yechish usullari. *Ilmiy ijodkorlik*, 1(1), 68-76.
20. Navruzov, U. B. (2023). Ba'zi matematik masalalarni yechishda klassik tengsizliklardan foydalanish usullari. *Unifikatsiya*, 1(1), 48-54.

