

THE CURRENT SIGNIFICANCE OF TEACHING MATHEMATICS

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Abstract: The present-day development of mathematics teaching, that is, modern teaching technology, expresses the way of mastering specific learning material within the scope of a particular subject, topic, and set of questions around a certain technology. It mostly reveals the features of its connection with the particular methodology.

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The present-day development of mathematics teaching, that is, modern teaching technology, expresses the way of mastering specific learning material within the scope of a particular subject, topic, and set of questions around a certain technology. It mostly reveals the features of its connection with the particular methodology. Pedagogical technology, in turn, expresses the tactics of introducing information technology, and knowledge is provided about its being elucidated on the basis of knowledge relevant to the laws of the functional system "teacher – pedagogical process – student."

In addition, in the learning process it is envisaged that lectures on designing and practically applying innovative educational technologies will be delivered in the forms of introductory, informational, conference, and problem lectures, and that every practical and laboratory session will be organized using graphic organizers (such as "INSERT," "B/B/B" [Know / Want to know / Learned], "cluster," "Venn diagram," "Why?," and others).

When presenting topics to pupils, the effective use of technical means is envisaged, as is the use of the achievements of pedagogical technology and information technologies when using slides with an overhead projector, electronic textbooks, or other technical means. Pupils acquire the necessary skills on the basis of the knowledge they gain during practical sessions. In training teachers to the level required by the times, the mathematics lesson is also of great importance in pupils' practice, in properly organizing their independent work, in organizing practical sessions, in involving them in conferences, and so on.

The concept of quantity is not only one of the basic concepts used in mathematics; it is also a concept used in other sciences such as physics and chemistry. Because it is interpreted differently in different sciences (and even in different sections of a single science), describing it leads to considerable difficulties. In mathematics, however, we define it as follows.

Definition 1. A general property inherent in objects or phenomena is called a quantity.

Definition 2. A quantity that satisfies the following conditions is called a homogeneous additive scalar quantity:

1) Any homogeneous quantities a and b can be compared; that is, only one of the relations a = b, a > b, a < b holds.

2) Any homogeneous quantities a and b can be added; that is, a + b = c (the sum quantity).

3) A quantity can be multiplied by a number.

4) Quantities can be subtracted; that is, a quantity satisfying the condition a − b = c is called the difference of the quantities a and b.

5) Homogeneous quantities can be divided: a / b = x. [40]

The purpose of using historical materials in primary-school mathematics lessons is to form pupils' initial concepts related to mathematics and to create the initial pedagogical conditions for ensuring the continuity of historical materials in accordance with the nature of the topic.

In increasing the effectiveness of mathematics lessons, the following aims were envisaged when using historical materials:

1. Deepening pupils' mathematical knowledge and mental imagery.

2. Arousing interest in, and a need for, the historical concepts given in the lesson.

3. Fostering a deep respect and love for the heritage of our ancestors.

In carrying out this task, we followed the following didactic conditions.

Through our experience, we became convinced that the existing didactic conditions for implementing the principle of consistency in the process of teaching mathematics mainly consist of the following:

- as a result of adapting certain didactic processes to proceed from the simple to the complex;
- applying the necessary methods in presenting the learning material;
- in the process of linking the unity of theory and practice, together with their more important and less important components, in presenting and studying the learning material;
- on the basis of ensuring thorough mastery of the learning material and announcing in advance its connection with future learning material;
- under these conditions, we tried to use the principle of consistency in our work.

Let us show the history of the measurement of time. The most difficult measure that pupils must learn is the measure of time. Children do not have sufficient experience in this area. First of all, this system of measurement differs from the decimal system. Second, it is learned with the help of a clock. Children are given an idea of the need for the hour (minute) in relation to the measurement of time. It suffices to remind them of a very simple case: a pupil who does not arrive at school on time.

For many ages, humans have kept track of time by means of the clock, which has undergone a great evolution over a long period. The first clocks were sundials. They were first made in Babylon and consisted of a stick set in a hemispherical stone or brick bowl hollowed out in the middle. Later, they passed to Greece and Rome.

The day was divided into parts according to the movement of the stick's shadow along the grooved lines on the edge of the bowl. But these clocks worked only on sunny days. What should be done when the sky is cloudy? A way was found. In Egypt and Babylon, the water clock and the sundial were invented.

The first mechanical clock with a compass was created in 1612, in the sixteenth century, on the basis of Galileo's work on the pendulum. A pendulum clock was invented in Prague; somewhat later, C. Huygens created a clock with a visible spring. In time, the first pocket watches appeared, accurate to within one minute and having a hand that showed the minutes.

In practice
the proposed division of the dial into 24 hours was rejected. At the end of the sixteenth century, Rudolf divided the clock dial into 12 hours.

The Greeks divided the night, like the day, into three periods; however, as early as the time of Aristotle (fourth century BC), a full day and night was accepted as 24 hours. In astronomy, since the time of Ptolemy, the beginning of the day had been taken to be noon. One hour was set at 60 minutes, and one minute at 60 seconds. The circumference of a circle was divided into degrees and minutes. The terms “minute” and “second” are taken from Latin.

An experiment was conducted as follows: we gave children a task to be done in a very calm manner, and 15 minutes after they began to think about it, we advised them to postpone the work for a little while. The difference between the time they spent on the work and the time they spent idle is so great that their interest in the time spent on the work grows very strong. Through varied activities, one can also find out that time does not always pass in the same way for us. Holding “a minute of silence” in class and similar exercises also help children understand how long and difficult it is to remain motionless. Giving pupils tasks such as doing some work within a certain number of minutes, reading aloud for a set period of time, and so on also yields good results. In this way, children become practically acquainted with the minute, the second, the quarter hour, the half hour, and the hour.

These exercises can also be done with cardboard clocks whose hands can be adjusted by hand. After some time has passed, the exercise should be repeated every day, for at least a few minutes, even when it is not a mathematics lesson.

The curriculum requires becoming acquainted with the calendar in practice. This is appropriate for two reasons: first, a child must know how to use a calendar, and second, it gives children great joy.

So that children feel that the calendar is a “practical thing,” we do not force them to find and read dates when there is no need.

As brief information on the history of the calendar, one should tell the children that about 800 years ago Omar Khayyam devised an astronomical calendar, and that it is even more accurate than the calendar used today.

The term “calendar” is derived from the Latin word “komos,” meaning “to shout.” Once upon a time, special people announced by shouting and calling out that the crescent of the new moon had appeared. But there is also another fact, according to which, in ancient Rome, the calendar meant the book of debtors. Debtors paid the interest on their debts on the calendar day, the first day of each month, which was so called.

The first calendar, marking the beginning of the year (21 June), was created 4,000 years ago. This calendar, made of stone, is still preserved in England.

Among the ancient calendars, the most successful was the one compiled by the Egyptians. The Egyptians divided the year into 12 months of 30 days each, plus 5 additional days.

If we mark some date in school life (a game, an excursion, a holiday, vacations, and so on) and, in order to find out how much time remains until the marked day, give the children a calendar and ask them to tell us the relevant date and the time separating us from it, the children work with the calendar with great interest.

After all the questions that interest us have been solved, we find out who counted how, or who could not count. The children listen attentively to the teacher’s explanations. After that, they independently take the calendar and begin to look for holidays, the birthdays of their loved

ones, and
the like. We must ensure that the children become convinced that a great deal can be learned through a calendar, and that they determine the day of the moon's cycle in the sky.

In ancient times, that is, in the period when non-decimal measures (the cubit, the foot, the inch) were used in calculation, it was very difficult to replace one measure with another. Now very few non-decimal measures remain, for example, in denoting time and also in counting things by cubit and foot.

In mastering new concepts, counting by the foot, the cubit, and the dozen does not cause difficulty. By comparing the foot with the cubit or the dozen, we show concrete things. For in teaching mathematics we try to enrich children's mental imagery (relying on observation); only through mental imagery do problems and exercises acquire concrete content.

In the primary grades, children should become familiar with two denominations related to money (gold–money), metric measures (meters–centimeters), as well as units of weight (kilograms–decagrams) and the quantity denoting the liter.

For children, just as estimating distance "by eye" is important, so is estimating weight "by hand." This is because weighing on scales does not give a child a sufficient idea of weight.

Just as adults can roughly tell the weight of something by hefting it in the hand, if children also first estimate by hand the weight of a particular object and then weigh it on scales in order to compare, their mental imagery of the concept of weight is enriched even further.

From what has been stated above, it can be concluded that the resolution of these aims and tasks teaches teachers to keep pace with the times, to live with a genuine concern for the upbringing of young people, and to foresee the future clearly. It teaches every teacher to conscientiously envision the country's pressing problems, aims, and tasks and, in order to carry them out precisely, to put his or her capabilities, knowledge, and experience to work with dedication, and it fosters in him or her the skills of a creative approach to pedagogical activity.

In modern conditions, in the system of continuing education of the Republic of Uzbekistan, including within the subject of pedagogical mastery, the advanced pedagogical technologies and educational innovations used in the teaching practice of developed foreign countries are being employed. Below, we dwell on some of them.

Modular teaching is one of the promising systems of teaching, because it serves to develop learners' cognitive abilities and creative capabilities.

In traditional education, learning objectives are expressed through the teacher's activity, that is, they are oriented toward imparting knowledge, whereas in modular teaching they are expressed through the learners' activity and are oriented toward professional activity.

The following table presents the features that distinguish modular teaching technology from traditional teaching.

Traditional teaching technology	**Modular teaching technology**
One-directional information One-way communication (lesson → teacher → student) Receiving information	Encouraging active participation in learning through thinking and practical activity Two-way communication Remembering information through

Traditional teaching technology	Modular teaching technology
Storing in memory Mechanical memorization without understanding the meaning	analysis Demonstrating knowledge and skills Understanding the content and connecting it to life

The analysis of this table shows that education based on modular technology differs significantly from traditional education in its teaching methods and means, in its organization, and in its results. Modular teaching creates the opportunity to solve the following modern problems of education comprehensively.

The modular system creates opportunities for: optimizing and systematizing the content of teaching on the basis of activity, and ensuring the variability and flexibility of programs; individualizing teaching; teaching practical activity and controlling teaching effectiveness at the level of assessing observable characteristics; activation based on stimulating interest in the profession; and fully realizing the opportunities of independent learning and teaching.

The effectiveness of modular teaching depends on the following factors: the material and technical base of the educational institution; the level of qualified teaching staff; the level of students' preparedness; the assessment of expected results; the development of didactic materials; and the results and analysis of modules.

In modular teaching, the possibility of step-by-step teaching is created through fully shortened and deepened differentiation of curricula. That is, it becomes possible to individualize teaching. The following aims are pursued in moving to modular teaching: ensuring the continuity of teaching; individualizing teaching; creating sufficient conditions for the independent mastery of learning material; intensifying teaching; and achieving effective mastery of the subject.

Modular teaching requires problem-based and instructional lectures giving generalized information on the main issues of the subject. Lectures should be aimed at developing pupils' creative abilities.

The practical and laboratory sessions of a module should be structured together with the lectures, and they should supplement the content of the lectures with new material to be studied.

References:

1. Kline, M. (1972). The History of Mathematics and Its Ideas.
2. Vinner, N. (1986). The Philosophy and Method of Mathematics. Tashkent.
3. Qodirov, A., Jo'rayev, B. (2003). History of Mathematics. Tashkent.
4. Rasulov, A. Fundamentals of Statistics. Tashkent: Universitet, 2015. 256 pp.
5. Jo'rayev M. The Economy of Uzbekistan: Yesterday and Today. Tashkent: "Fan", 2019. 210 pp.
6. Jumayev M.E. Methodology of Teaching Mathematics (textbook for higher education institutions). Tashkent: "Turon-Iqbol", 2016. 426 pp.
7. Berdiyev B.R. Methodology of Teaching Mathematics. Book I (textbook for higher education institutions). Karshi: "Fan va ta'lim", 2021. 260 pp.
8. Berdiyev B.R. Methodology of Teaching Mathematics. Book II (textbook for higher education institutions). Karshi: "Fan va ta'lim", 2021. 250 pp.