Methodology of lessons of generalization and repetition in mathematics on the basis of active learning

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Paper received 25.08.17; Accepted for publication 01.09.17.

Abstract. In this article some methodical developments are presented on the introduction of active forms of teaching mathematics, aimed at the formation of generalized knowledge and skills that prepare students for solving problematic, productive tasks, contribute to positive shifts in their intellectual development.

Keywords: *training, mathematics, activation, problem task, lesson technology.*

Achievement of great goals, the construction of a new society in which the life of mankind will be prosperous and worthy, first of all depends on the members of this society, on decent people and a decent generation.

The strength of any country is determined by its intellectual potential.

The national model of training, developed on the initiative and under the direct leadership of Islam Karimov, is unique in its nature and the importance of its constituent components.

It is aimed at training socially mobile, active, independent thinkers, highly qualified, component specialists - professionals with highly developed spiritual and moral traits capable of ensuring the progress of Uzbekistan [1].

Activation of mental activity is always connected with solving a problem situation, which contains a conflict between what is given and what needs to be learned, to find out. Consequently, the conditions of human activity are the source of his creativity, but some conditions are not enough to realize the creative process.

Pedagogical science constantly improves the various ways of active learning, aimed at the formation of generalized skills that prepare students for solving problematic, productive tasks, contribute to positive shifts in their mental development.

A positive attitude towards learning is an absolutely necessary condition for the full assimilation of educational material. Studies of psychologists (LS Vygodsky, ND Levit, etc.) [2] showed that such an attitude helps to form the following factors: the ideological and scientific content of the educational material, the problematic and emotional character of the presentation, the organization of cognitive search activity Students, which gives them the opportunity to experience the joy of independent discoveries, equipping students with rational methods of teaching.

The comprehension, the understanding of the educational material, the inclusion in a certain system, the establishment of local, intrasubject and interdisciplinary connections (according to AA Smirnov) [3] - the next component of the assimilation. Understanding always means the inclusion of material in the system of already established associations, the binding of unfamiliar material with the already familiar.

The information received and processed by the thinking, the students should be stored in memory so that at any time it is possible to extract the necessary information from the memory stocks and apply them. Remembering directly depends on the nature of the activities of students. Numerous observations and experiments (AA Smirnov, PI Zinchenko) [4] showed that the greatest efficiency of memorization is observed when it occurs in some kind of active activity.

Studying in universities, students not only master the basics of science, but also acquire a variety of skills. Ability is the successful accomplishment of some action or complex activity with the use of correct methods, methods (V.V. Davydov). Automated techniques and methods of work that are compound moments in complex, conscious activity (V.V. Davydov) called skills [5].

It is advisable to use active forms of training aimed at identifying knowledge levels, developing critical thinking, mutual assistance and mutual learning, self-esteem and correction during practical lessons on the subject.

We will give below the methodological development of a practical lesson in mathematics.

Scenario of repetition and generalization practical occupation on topic "First-order comparisons with one unknown"[6]

The group will be scouted, the theme and the purpose of class will be announced. During the class by the suggestion of group students two groups of experts will be selected to choose the tasks assigned to students, to check and evaluate the assignments, to evaluate the student's opinions in the debate.

During the class, experts will be given a number of freedoms:

- Call students to order;
- Activate inactives;
- Identify examples provided to groups;
- The examples that are being worked out will decide which student idea will be heard on the problem;
- Examine and evaluate students' written assignments;
- Apply to the teacher when needed.

The teacher monitors the students' work with the experts and gives their opinion when it is needed.

The experts divide the group into two groups. A high score for each correct and complete task is set at 1 point.

Task 1. Experts distribute assignments to each student, required to create algorithm of the first-order comparisons with one unknown. Once the assignment leaflets have been distributed to everyone, the assignment will be solved. This assignment takes 3 minutes. The student announces that he has completed the assignment. For the first two students who have successfully completed the assignment, experts may place various incentive estimates up to 0.5 estimate.

Students who complete the assignment will exchange the task sheets with each other and will check the responses of their partners. Inspection is done with red ink. The inspection period is 2 minutes. The results are handed over to experts. The answer sheets of students who have not completed their time will also be collecting. The teacher offers an example to solve for students until the experts review the answers and corrections.

Based on the results of the examinations, the experts will select one of the highest and lowest results and invite them to the discussion. The low score student writes to the board

his/her answer and a student who has a high score, showing the student's error and correcting it. Based on the accuracy of corrections, the accuracy of the speech, and the logical correctness of the student, the students evaluate the respondent. The supporters of the appraisal of an extra 1 will raise hands, neutralize and oppose will not. If there are more than 10 raise hands people, than will be add incentive estimate. The reason for the high estimate of motivation is that the future teacher should already be able to shape pedagogical traits. The points scored by each student in the Task 1 are recorded in a special table.

Task 2. Experts distribute assignment leaflets to draw the cluster of the way by solving the first-order comparisons with one unknown, the basic concepts, reflecting the one-side and double links between them. It takes 10 minutes for this task. Experts point out the time spent on the answer sheets of the worker. After a certain period of time, the experts collect the answers and examine the students before the next assignment. Experts estimate the score in the clusters at the expense of 1 point, depending on the number of correct concepts and timing. The links they have been inspected by the experts and teachers are analyzed in the next lesson and are evaluated at an additional 3 points.

Task 3. Experts select one of the cards offered by the teacher. There are six examples in the cards. Until the experts write the two sets of cards on the board, the teacher distributes up to 6 leaflets. Each student group has to solve each of the six examples in different ways and write them to the appropriate answer sheet. First, by using the first test method, then using the second form substitution. . . examples will be solved. Examples which are solved handed over to experts.

(It is possible to draw the attention of teachers or experts by hand). Experts check the submitted solutions and issue scores. It takes about 20 minutes to complete the assignment. Students who finished work on their own group can use the second group examples to write their workbooks. Upon expiry of the period, the leaflet will be collected. Experts record in special table how many students have solved, in which group and by which way. Based on the answers of the students participating in the discussion, the group assesses them. Students who are able to open the advantages of other ways in their chosen path may receive an additional 1 estimate. Experts should not invite the student once for the second time. Student scores are recorded in a special table.

In the repeat-generalization lesson, we consider it necessary to take sufficient time to consider the examples, taking into account the importance of the student's shortcomings and the need to overcome the failures in knowledge. The students will be given the next assignments depending on the degree of their learning, the active, the quick and the aggressive behavior of the lesson, and the remaining time.

Task 4. Both experts will select one of the cards with an example of the system by first-order comparisons with one unknown and recommends this example to their chosen group. Two expert on boards, two groups of students on their side will solve the problem. Experts have to be skeptical about each other and students. Once the experts have removed the sample, for students will be given one more minute and the sample solution will be halted.

Experts explain the chosen path and problem solving process to students and answer students' questions. The teacher answers the questions that the experts have been unable to answer whenever necessary.

The teacher expresses his / her opinion on the topic during the classroom, on the subject, and suggests solving the planned test tasks for 10 minutes. The test tasks are designed for each student on separate cards. The test results will be checked and the students will be evaluated.

In order to prepare for the next assignment, the homework assigns the teacher:

1. Repeat the topic "High level comparisons, starting roots and indices" and simplification of 5 types top level comparisons; symbol of Legend; the order of the number; the table of indices; solving one of the examples on high-level two-dimensional comparison with indices.

Handouts

Task 1.
$ax \equiv b(\mathrm{mod}\, m)$, $a \vdots m$ Make the comparison process algorithm.
Number of edits:
Ball:

Task 2.
$ax \equiv b(\mathrm{mod}\, m), a \vdots m$ Create a cluster of ways to solve the problem and related concepts.
The number of cluster concepts:
Analysis of built-in Connectivity:
Ball:

Examples of assignments task 3

Group 1
1. $4x \equiv 6(\mathrm{mod}\, 10)$.
2. $6x \equiv 7(\mathrm{mod}\, 5)$.
3. $29x \equiv 3(\mathrm{mod}\, 12)$.
4. $15x \equiv 37(\mathrm{mod}\, 98)$.
5. $21x \equiv 17(\mathrm{mod}\, 23)$.
6. $9x \equiv 3(\mathrm{mod}\, 11)$

Group 2
1. $8x \equiv 16(\mathrm{mod}\, 12)$.
2. $12x \equiv 1(\mathrm{mod}\, 7)$.
3. $5x \equiv 26(\mathrm{mod}\, 16)$.
4. $32x \equiv 182(\mathrm{mod}\, 119)$.
5. $5x \equiv 7(\mathrm{mod}\, 24)$.
6. $16x \equiv 50(\mathrm{mod}\, 23)$.

Task 3 leaflet

Test method Example №	Figure Modifying Method Example №	With the Euler function Example №	Using a continuous fraction Example №	Using an Invert Class Example №	Index. With table Example №
Note	Note	Note	Note	Note	Note
Ball:	Ball:	Ball:	Ball:	Ball:	Ball:

Example of task 4

Group 1

$$\begin{cases} x \equiv 2 (\mathrm{mod}\, 3), \\ x \equiv 3 (\mathrm{mod}\, 4), \\ x \equiv 4 (\mathrm{mod}\, 5). \end{cases}$$

Group 2

$$\begin{cases} 2x \equiv 3 (\mathrm{mod}\, 5), \\ 3x \equiv 5 (\mathrm{mod}\, 7), \\ 3x \equiv 3 (\mathrm{mod}\, 9). \end{cases}$$

Table of students' scores

№	First name	Task 1		Task 2		Task 3		Task 4		Total
		Ball	Motivation ball	Ball	Motivation ball	Ball	Motivation ball	Ball	Motivation ball	

Technological map of the process of repetition and generalization

1.	Theme	"First-order unknown comparisons".
2.	Objective	to obtain the first results of modular technology of education used as experiment; To summarize and summarize students' knowledge on the subject.
3.	Functions	Theoretical and practical aspects of the subject include strengthening students' theoretical, practical knowledge, raising their level, forming critical, logical thinking, expressing ideas, arguments and arguments in writing and verbally, skills improvement; Creative approach to education, interest in the effectiveness of their work, the need to demonstrate their abilities, the ability to explore their abilities and capabilities, to strive for personality, to focus on the problem, to discuss issues and situations from a different angle To formulate and develop features such as the ability to find consensus decisions, to respect others' opinion, to be polite, to be active, to work with the team.
4.	Techniques	Module, Problematic, Temporary Restrictions, Critical Thinking, "Speech Thinking", Individual Training, "Sectors".
5.	Forms	Individually, collectively.
6.	Curriculums	Exhibition and distribution materials.
7.	Skill	Oral, sketch, writing.
8.	Control	Oral, written, self-helping, teamwork.
9.	Rating	Not more than 1 estimate for each complete and accurate task. Up to 0.5-1 estimates for participation in assignments analysis.
10.	Results	Given assignments - the number of students who completed 86-100% - the number of students who completed 71-85% - the number of students who completed 56-70% - the number of students who completed 0 - 55%
11.	Conclusions	Consciousness, skill : 1) all students have mastered - 2) by many students (over 70%) - 3) Incompleteness (40-70% 4) not used by many -
12.	Independent training	Repeating the topics "High level comparisons", "Elementary roots and indexes" and 5: simplifying high level comparison, solving the problem of the symbol of Lejandr, the order of the number, the index of the index, the solution of the top two-line comparison with the index table; Getting acquainted with students' knowledge, skills and abilities in the academic lyceum program on the topic of "comparisons".
13.	Literature	1. The literature mentioned in the module. 2. General Education in Secondary Special, Vocational Education State Education Standards and Curriculums. T., 2010. 3. "Fundamentals of algebra and mathematical analysis", for Academic lyceums. T., 2013.

The introduction of pedagogical technology into the process of teaching mathematics is associated with the abstract nature of the content of mathematics, the specifics of the applied methods of mathematics, as well as with the difficulties of mastering, mistakes made by students in solving learning problems. On the basis of their accounting and overcoming the shortcomings of knowledge and skills, adjusting the dynamics of their development, contributes to the development of new pedagogical technologies in the study of mathematics

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Методика уроков обобщения и повторения по математике на основе активного обучения

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Аннотация.В данной статье приведены некоторые методические разработки по внедрению активных форм обучения математики, направленные на формирование обобщенных знаний и умений, которые подготавливают студентов к решению проблемных, продуктивных задач, способствуют положительным сдвигам в их интеллектуальном развитии.

Ключевые слова: *обучение, математика, активизация, проблемная задача, технология урока.*