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ПӘНДЕРДІ ОҚЫТУ ӘДІСТЕМЕСІ ЖӘНЕ ТЕХНОЛОГИЯСЫ МЕТОДИКА И ТЕХНОЛОГИЯ ПРЕПОДАВАНИЯ ДИСЦИПЛИН

UDC 510

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DIDACTIC FEATURES OF TEACHING STUDENTS TO SOLVE INEQUALITIES

Abstract

For our country to become one of the most civilized states, we need to prepare an educated generation. In this regard, one of the main tasks of the education system today is the effective use of innovative pedagogical technologies in teaching. One of these new technologies is inequality problems used in teaching and evaluating knowledge. After all, the problem system allows you to objectively evaluate students' knowledge, check their level of training for compliance with the requirements and identify topics that caused difficulties.

The process of organizing students' educational activities through inequality problems in teaching mathematics requires that each high school and college graduate be more purposeful, methodologically, and methodically justified to optimally adapt to modern industrial and social processes.

In this regard, there is a contradiction between the need to train an educated, competent, conscious generation that thinks creatively in accordance with modern society and the lack of detailed study of the methodological foundations of organizing students' educational activities through testing in teaching mathematics. The identified contradiction caused the problem of our research to justify the methodology for organizing students' educational activities through testing in the process of teaching mathematics.

Key words: *inequalities, logical thinking, mathematical tasks, non-standard problems, stages of solving inequalities.*

1 Introduction

In-depth study of mathematics at school provides, in addition to obtaining by students an expanded amount of knowledge and technique of mastering the subject, the formation of students' interest in the subject, the development of mathematical abilities, an orientation towards professions significantly related to mathematics. The implementation of these tasks is directly related to the content of mathematics education [1].

Currently, the solution of many social, economic, political, and other social problems is possible only if society has a sufficiently high level of cultural development, and the younger generation has high spiritual and moral qualities [2].

In this regard, professional training no longer meets the requirements of the time, and the personal and professional significance of the graduate is becoming an important criterion for professional education. Higher education is not only professional, but also becomes an element of the general culture of a person [3]. The holistic image of a university graduate is presented by many scientists as a free, spiritual person, focused on the values of world and national culture, capable of creative self-realization and adaptation in an ever-changing socio-cultural environment. In this

regard, the optimal education system should correspond as much as possible to the new type of developing culture.

The great educator is our teacher Y. Altynsarin "... it is necessary to cultivate hard work, sincerity, simplicity, kindness, conscientiousness and start evaluating your abilities from early childhood." In his opinion, it is stated that " a Model School of a new type should attract students, teach them the culture, knowledge of their environment, and the work of thought through the control of their actions" [4].

The great poet and writer Abay Kunanbayev said to all people, "be a man!" the most important ability of a person is the ability to change himself with the environment. The basis of the human principle is spirituality. He said that only when a person learns languages and norms of behavior, it is possible to form the principles of spirituality, charity, sincerity, justice, self-knowledge, and an assessment of their abilities [5].

L.S.Vygotsky "whatever social motives, educational motives, they should be associated with the growth and development of the child's personality. If motives are organized in accordance with the content of learning, its activity significance for children becomes periods of high degree. At the same time, the position of children is transformed from the activity of a person who comes to school and is limited to the careful execution of the teacher's instructions, to the activity of a person who understands the ultimate goal and purpose of his actions, " he said. [6].

Quality education is the main indicator that determines the future of the country. Therefore, today, the creation of a new system of education, updating the content and methods of education is aimed at educating a competitive citizen who works in a creative direction and is distinguished by mental abilities.

William Ward, the great English educator, said that a simple teacher informs, a good teacher explains, a great teacher shows, a great teacher inspires. In this regard, today teachers are faced with the task of harmonizing the system of education in accordance with the requirements of the time, conducting it in a new format, and new requirements are imposed on education, the entire educational and methodological system. Conducting classes using technological methods helps students to develop themselves, find gaps in their knowledge, and gain comprehensive knowledge in search of answers to their own questions [7].

When reading these topics, it is useful to display some tasks on the big screen and discuss the solution process collectively. At the same time, students learn to justify their point of view, prove the correctness of their conclusions. Students may make mistakes when completing a task, so corrective work on the big screen is necessary. Several tasks are problematic, some tasks are difficult, so the role of the blackboard is played by a large screen, such explanatory and illustrative work is equally useful for all students and students with gaps in knowledge and students who have successfully mastered this topic.

The use of computer technologies in the interpretation, perception, understanding, approval of new material, as well as in the control of students ' knowledge of the subject, has its pros and cons.

Successfully implemented [8]:

- individualization and differentiation of training;
- activation of creative activities of students;
- possess self-control skills;
- changing the role of the student in the learning process from a passive observer to an active researcher;
- conditions are created that allow the student to experience a sense of success in achieving their learning goals, which is important for achieving the quality of students ' knowledge of the subject.

When testing knowledge, the following positive points can be distinguished

- you will not be able to help and download;
- increasing the objectivity of knowledge assessment;

- various cognitive activities of students are stimulated;
- the role of the teacher has changed, Control and assessment of knowledge has become much easier;
- improving the psychological climate among students;
- the number of control measures will increase, which will allow timely verification of knowledge in all groups of students in many sections of the course being studied.

In the context of updating the content of school education, the educational process is characterized by the active activity of students in each lesson on their own "acquisition" of knowledge. In such a situation, the student acts as a subject of cognition, and the teacher acts as an organizer of students' cognitive activity. Then the learning goals will be shared between the student and the teacher.

The content specifics of the updated educational program are as follows:

- the spiral principle of designing the content of the discipline, that is, the gradual cultivation of knowledge and skills both vertically and horizontally (complication of skills by subject and class);
- hierarchy of educational goals according to bloom's taxonomy, based on the laws of cognition and classified by the most important types of subject operations (knowledge-understanding-application-analysis-synthesis-evaluation);
- setting pedagogical goals by level of education (the goals of training are set in long-term planning, the teacher is obliged to adhere to them) and throughout the course of study, which allows us to take into account as much as possible the subject ties;
- the presence of "transition topics" between disciplines, both within the same field of education and in the implementation of interdisciplinary links;
- content of the section and compliance of the proposed topics with the requirements of the time, emphasis on the formation of social skills;
- technologization of the educational process in the form of long-term, medium-term and short-term plans.

Active forms of learning (problem-based learning technologies, games (business, industrial games) are used in the classroom. Students should independently develop functional literacy, actively "master" knowledge, develop communication skills with peers, and be creative in solving problems.

Level differentiation of students is important. Education is based on an individual-oriented character, which is aimed at implementing the principle of developing learning, taking into account the nearest development zone of students.

To develop a methodology for organizing educational activities through testing in teaching mathematics, we started with the development of a model that shows the relationship of the three functions performed by the test to the educational activities of students. We have described in detail each component of the model.

Control and diagnostic tests in the process of teaching mathematics, the composition of tasks and the place of their application in the process of forming a concept, are distinguished for working with a theorem.

The control tester consists of a test that implements the control function of learning and is used before and after the study of the subject, concept, theorem. In the first case, they are used to determine the state of actions that were formed before the study of a large topic or a new topic. Secondly, the actions formed while studying a topic, section, entire academic year, nine-year or high school course are taken under control.

2 Materials and methods

Therefore, the relevance of the study is to find ways to systematically use educational research in the process of teaching students to solve parametric equations, inequalities and their systems. Much is said in the scientific literature about the importance of using the functional approach in solving various problems of elementary mathematics, including inequalities. In the

textbook, it is noted that the line of equations and inequalities, which makes up a significant part of the school mathematics course, is inextricably linked with the functional line. One of the most important such connections is the application of methods developed in the line of equations and inequalities to the study of functions (for example, to tasks for finding the domain of definition of certain functions, their roots, intervals of sign-constancy, etc.). On the other hand, the functional line has a significant influence both on the content of the line of equations and inequalities, and on the style of its study.

3 Results and discussio

The textbook provides a statement of the point of view on equations and inequalities, built on a functional basis, which is as follows:

1) both parts of the inequalities are considered as functions of the variables included in the equation (inequality), and to write the inequalities in a general form, functional notation is used, for example: $f(x) = g(x)$, $f(x) < g(x)$;

2) the concept of the domain of definition of the inequality is established, which is defined as the intersection of the domains of definition of functions representing both parts of the inequality;

3) a graphical method for solving inequalities is systematically applied, requiring the construction of graphs of the corresponding functions;

4) when studying inequalities, the properties of functions are used in appropriate cases.

There are given some examples of non-standard word problems, the solutions of which are directly related to inequalities:

Example 1: At the festival, each child was presented with the same number of toys. The number of toys presented to each child was 9 less than the total number of children present at the festival. If there were 9 children at the festival and each child was given one more toy than before, then the previous number of toys would not be enough. How many toys were donated if it is known that the number of children present at the festival was odd?

Solution: lets denote the number of children – x , the number of toys to each child – y

Then,

$$\begin{cases} x - y = 9 \\ 9(y + 1) > x * y \end{cases} \quad x, y \in \mathbb{Z}^{++} \text{ and } x \text{ is odd} \quad \text{What is } xy?$$

$$\begin{cases} x - y = 9 \\ 9y + 9 > xy \end{cases}$$

$$9(x - 9) + 9 > x(x - 9)$$

$$9x - 81 + 9 > x^2 - 9x$$

$$x^2 - 18x + 72 < 0$$

$$(x - 6)(x - 12) < 0$$

$$x \in (6; 12), \text{ as } x \text{ is odd, } x = 7, 9, 11 \quad \text{If } x = 7, y = -2 \notin \mathbb{Z}^{++}$$

$$\text{If } x = 9, y = 0 \notin \mathbb{Z}^{++}$$

$$\text{If } x = 11, y = 2 \in \mathbb{Z}^{++}$$

The answer is: $11 * 2 = 22$ toys

Example 2: In the 5 years since the foundation of the department, the number of researchers has increased 7 times, and the number of laboratory assistants has increased 10 times, while the total number of employees of the department has remained less than 45. After another 5 years, the number of researchers increased by 2 times, and the number of laboratory assistants decreased by 2 times and the total number of employees became more than 42. How many researchers and

laboratory assistants were in the department when it was founded, if there were fewer researchers than laboratory assistants?

Solution: x – number of researchers; y – number of lab.assistants

$$\begin{cases} 7x + 10y < 45 \\ 14x + 5y > 42 \end{cases} \quad x < y, x, y \geq 0$$

$$+ \begin{cases} 90 > 14x + 20y \\ 14x + 5y > 42 \end{cases}$$

$$14x + 5y + 90 > 14x + 20y + 42$$

$$48 > 15y$$

$$y < \frac{48}{15} \quad y < \frac{16}{5} \quad y < 3.2$$

$$+ \begin{cases} 45 > 7x + 10y \\ 28x + 10y > 84 \end{cases}$$

$$28x + 10y + 45 > 7x + 10y + 84$$

$$21x > 39$$

$$x > \frac{13}{7} \quad x > 1.8 \dots$$

As $x < y$, $x = 2 < y = 3$ **Answer is $x = 2, y = 3$**

Example 3: The productivity of the first automobile plant does not exceed 950 cars per day. The productivity of the second automobile plant was initially exactly 95% of the productivity of the first plant. After the introduction of the additional line, the second plant increased the production of cars per day by exactly 23% of the number of cars produced at the first plant, and began to produce more than 1,000 of them. How many cars per day did each plant produce before the reconstruction of the second plant? It is assumed that each plant produces integer number of cars.

Solution: 1st plant: $k < 950$ cars/day

2nd plant: $0.95k$

After additional line, the 2nd plant: $0.95k + 0.23k > 1000$, where $k, 0.23k, 0.95k \in \mathbb{Z}$
 $1.18k > 1000$

$$k > 847.4$$

$$847 < k < 950$$

$$804 < 0.95k < 902$$

$$194 < 0.23k < 218$$

we get only one solution for $k = 900$

Answer is $k = 900$

4 Conclusions

Control and diagnostic tests in the process of teaching mathematics, the composition of tasks and the place of their application in the process of forming a concept, are distinguished for working with a theorem.

The control tester consists of a test that implements the control function of learning and is used before and after the study of the subject, concept, theorem. In the first case, they are used to determine the state of actions that were formed before the study of a large topic or a new topic. Secondly, the actions formed while studying a topic, section, entire academic year, nine-year or high school course are taken under control.

According to our research, the main directions of using inequality problems in the process of teaching mathematics were identified:

1. In the process of teaching mathematics, it is possible to create inequality problems in the direction of evaluating the assimilation of knowledge, where the main problem is that it is possible to quickly identify and eliminate the shortcomings of the topics studied daily.

2. When preparing inequality problems for the organization, the basis is considered the age characteristics of students.

3. When compiling inequality problems for use at the UNT, it is advisable to have closed inequality problems of all types (for one and more options) and open ones.

References

1. A. Szabo, Mathematical abilities and mathematical memory during problem solving and some aspects of mathematics education for gifted pupils (Doctoral dissertation, Department of Mathematics and Science Education, Stockholm University), 2017.

2. U. Khodjamkulov, K. Makhmudov және A. Shofkorov, «The Issue of Spiritual and Patriotic Education of Young Generation in the Scientific, Political and Literary Heritage of Central Asian Thinkers,» *International Journal of Psychosocial Rehabilitation*, %1-том24, № 05, pp. 6694-6701, 2020.

3. T. N. Shestakova, L. M. Sukhorukova, M. V. Ivchenko және N. I. Fokin, «Education as the national safety element in the globalizing world,» *Integration and Clustering for Sustainable Economic Growth*, pp. 167-172, 2017.

4. Ы. Алтынсарин, Шығармалары, Алматы: Жазушы, 1986, р. 201.

5. А. Құнанбаев, Қара сөздер, Алматы, 1996, р. 67.

6. Л. Выготский, Психология развития человека / Л.С.Выготский, Москва: Смысл. Эксмо, 2005, р. 1136.

7. W. Mehrens және J. Kaminski, «Methods for improving standardised test scores: Fruitful, fruitless or fraudulent?,» *Educational Measurement: Issues and Practice*, pp. 14-22, 1989.

8. E. Z. Smagulov, B. E. Smagulov және A. T. Zheksenbay, «On the role of tasks in the formation and development of students' mathematical thinking,» *Proceedings of the international scientific - practical conference "problems of mathematical*

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БЕКБОЛГАНОВА, А., САРГУЖИЕВА, Ә. ОҚУШЫЛАРДЫ ТЕҢСІЗДІКТЕРДІ ШЕШУГЕ ҮЙРЕТУДІҢ ДИДАКТИКАЛЫҚ ЕРЕКШЕЛІКТЕРІ

Еліміз өркениетті мемлекеттер қатарына енуі үшін білімді ұрпақ дайындауымыз керек. Осыған орай, бүгінгі таңда білім беру жүйесінің негізгі міндеттерінің бірі – оқытуда инновация-педагогикалық технологияларды тиімді пайдалану болып табылады. Осындай жаңа технологиялардың бірі – оқыту мен білімді бағалауда қолданылатын теңсіздік есептері. Өйткені, проблемалық жүйе студенттердің білімін объективті бағалауға, олардың дайындық деңгейін талаптарға сәйкестігін тексеруге және қиындықтар тугызған тақырыптарды анықтауға мүмкіндік береді.

Математиканы оқытуда теңсіздік есептері арқылы оқушылардың оқу іс-әрекетін ұйымдастыру процесі әрбір орта мектеп пен колледж түлегінен қазіргі өндірістік және әлеуметтік процестерге оңтайлы бейімделу үшін неғұрлым мақсатты және әдістемелік тұрғыдан негізделген болуын талап етеді.

Осыған орай, қазіргі қоғамға сай білімді, сауатты, саналы, шығармашылықпен ойлайтын ұрпақ дайындау қажеттілігі мен математиканы оқытуда тестілеу арқылы оқушылардың оқу іс-әрекетін ұйымдастырудың әдістемелік негіздерінің егжей-тегжейлі зерттелмегендігі арасында қарама-қайшылық бар. Анықталған қайшылық біздің зерттеу жұмысымыздың проблемасын математиканы оқыту процесінде тестілеу арқылы оқушылардың оқу іс-әрекетін ұйымдастыру әдістемесін негіздеуге себеп болды.

***Кілт сөздер:** теңсіздіктер, логикалық ойлау, математикалық есептер, стандартты емес есептер, теңсіздіктерді шешу кезеңдері.*

БЕКБОЛГАНОВА, А., САРГУЖИЕВА, А.

ДИДАКТИЧЕСКИЕ ОСОБЕННОСТИ ОБУЧЕНИЯ УЧАЩИХСЯ РЕШЕНИЮ НЕРАВЕНСТВ

Чтобы наша страна стала одним из самых цивилизованных государств, нам необходимо подготовить образованное поколение. В связи с этим одной из основных задач системы образования на сегодняшний день является эффективное использование инновационно-педагогических технологий в обучении. Одной из таких новых технологий являются неравенства, используемые при обучении и оценке знаний. Ведь система образования позволяет объективно оценить знания студентов, проверить их уровень подготовки на соответствие требованиям и выявить темы, вызвавшие трудности.

Процесс организации учебной деятельности студентов через задачи неравенства в обучении математике требует от каждого выпускника вуза и колледжа большей целеустремленности, методологической и методической обоснованности, оптимальной адаптации к современным производственным и социальным процессам.

В связи с этим возникает противоречие между необходимостью подготовки образованного, компетентного, сознательного поколения, творчески мыслящего в соответствии с современным обществом, и отсутствием детальной проработки методических основ организации учебной деятельности учащихся посредством тестирования при обучении математике. Выявленное противоречие обусловило задачу нашего исследования по обоснованию методики организации учебной деятельности учащихся посредством тестирования в процессе обучения математике.

Ключевые слова: *неравенства, логическое мышление, математические задачи, нестандартные задачи, этапы решения неравенств.*

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FORMATION OF CREATIVE LITERACY OF SCHOOLCHILDREN

Abstract

This article is about methods of improving the creative literacy of schoolchildren. The article offers a number of methods to suit the interests of today's youth and adolescents. The article contains the use of social media in developing the creative literacy of schoolchildren.

Moreover, the main attention was paid to the clubs of comprehensive development of students. Methods were studied on students of the "Bilim-Innovation" lyceum. We opened club "Uniqueens" with various departments: cooking, education, charity, debate, ukulele, and handicraft, which are functioning till now. We put students as the heads of departments of the club, to make them more social and to embody their ideas. We paid attention to develop student's creativeness, and made several activities.

And during the survey, which is taken as the result of 5 months functioning, to know the impact of clubs on students, it was observed that it had a positive effect on students.

Key words: *Literacy, Creativity, School Clubs.*