



THE ROLE OF PROBLEM-BASED TASKS IN DEVELOPING MATHEMATICAL THINKING SKILLS OF LYCEUM STUDENTS

Nurmukhamedova Umida Bakhtiyar qizi

Teacher of Mathematics at ChDPU academic Lyceum

+998990446002

E-mail: umidanurmukhamedova111@gmail.com

Abstract: *One of the important tasks of Mathematics is the formation of logical thinking, analysis, problem solving skills in students. Especially for students studying at the Lyceum stage, these skills will be of great importance in scientific and practical activities in the future. Mathematical thinking is the art of not only memorizing formulas and rules, but also applying them in different situations, analyzing new situations and finding solutions. In this regard, problem assignments are an important tool in activating the thinking process of students, teaching them to think independently.*

Keywords: *mathematics, independent thinking, problems, logical thinking, formulas, rules, knowledge, practical training.*

INTRODUCTION

Problem assignments allow students to analyze complex and ambiguous situations. Through these assignments, the student learns to put their knowledge into practice, independently acquires new knowledge and is taught to base their opinion. Problem assignments are often multi-level, complex, and requiring different solution paths that develop students' analytical thinking, the ability to see logical connections. At the same time, these assignments help to form qualities in students, such as patience, perseverance and creativity. Another advantage of applying problem assignments for high school students is that they develop students' independent learning skills. Students independently examine their knowledge when completing a task, look for new information, analyze various sources and create their own



solutions. This leads them to learn independently and actively, regardless of the teacher's instructions alone. In this way, problem assignments increase students' self-control and self-assessment skills. The role of problematic tasks in the development of Mathematical Thinking Skills is also their formation of a creative approach in students. Problem assignments often require thinking outside of standard solution paths. This allows students to experiment with new techniques, create their own solutions, and express their opinion freely. As a result, students not only consolidate their mathematical knowledge, but also develop creative thinking skills.

MATERIALS AND METHODS

In order to effectively incorporate problem assignments into the learning process, teachers need to improve their methodologies. To do this, it is important to choose and adapt assignments, taking into account the individual abilities, interests and knowledge levels of students. Important factors are also the step-by-step complexity of assignments, giving students enough time and encouraging them. In this process, the teacher must monitor the students' thinking process, provide assistance when necessary, and encourage them to think independently. While developing logical thinking in students, problem assignments also serve to deepen their mathematical knowledge. Through these assignments, students learn to put mathematical concepts and rules into practice, strengthen their theoretical knowledge, prepare to acquire new knowledge. At the same time, problem assignments form the skills of testing, error detection and correction of their knowledge in students. Problem assignments also develop students' teamwork skills. Most often, these types of assignments are solved in a group, which allows students to exchange ideas with each other, provide mutual assistance and find a solution together. Teamwork increases communication skills in students, training them to work responsibly and cooperatively. The role of problem assignments in increasing interest in students is also great. Compared to simple and standard assignments, problem assignments increase students' interest in learning, encouraging them to be active and creative. This in turn increases the effectiveness of the learning process and improves the level of student mastery. [1]



In order to achieve effectiveness in teaching problem assignments, it is necessary to apply various pedagogical methods and approaches. Problem assignments serve to develop students' independent thinking, analysis, and creative approach skills. Therefore, when teaching this type of assignment, it is important to take into account the content of the methods, the interests of the students and the features of the educational process. [2]

RESULTS AND DISCUSSIONS

The main idea of the problem teaching method is that students must independently use their knowledge and skills to deal with problem situations in order to acquire new knowledge. In this approach, the teacher not only provides theoretical information, but also provides students with the opportunity to express their thoughts, analyze the problem and test various solutions. This process forms independent thinking and problem-solving skills in students, and also increases their creative potential. In the method of project activity, students work together to carry out a certain problematic task. In the process of completing the project, they go through stages such as collecting data, analyzing it, finding solutions to the problem and presenting the results. This method develops students' teamwork skills, teaching them to manage, communicate, and take responsibility.[3]

Project activities give students a real-life problem-solving experience that increases their interest in reading. Discussion and discussion techniques are very effective in teaching problem assignments. In these techniques, students freely express their thoughts, listen to the opinion of others and compare different views. This process increases students' critical thinking and argumentation skills. Discussion also teaches students to respect the opinions of others, to compromise, and to be effective in communication. Through discussion, students have the opportunity to consider problem situations from different perspectives, expanding their worldview and range of knowledge. The Case-study, or case study method, is of practical importance in teaching problem assignments. In this method, students are presented with problematic situations derived from real life or scientific practice. Students analyze these cases in an attempt to identify and find solutions to the problem. This



approach allows students to practice theoretical knowledge and develops their analytical thinking skills. The Case-study method encourages independent student performance and prepares them for real-life challenges. Interactive methods are an effective tool for attracting students' attention and encouraging them to actively participate in teaching problem assignments. With the help of Multimedia tools, interactive presentations, online platforms and simulations, students learn problem situations in a more interesting and understandable way. This method increases the interaction of students, teaches them to apply new technologies and makes the learning process more efficient. With interactive techniques, students have the opportunity to test their knowledge in practice, which increases their motivation for learning. The differential approach is based on taking into account the individual characteristics of students when teaching problem assignments. Each student's level of knowledge, ability, and learning style may vary. Therefore, the teacher should formulate assignments in such a way that they correspond to the needs of each student. This approach helps students to maximize their potential and increases their interest in learning. Using a differential approach, students can learn at a convenient pace, which increases the effectiveness of the reading process.[4]

CONCLUSION

In conclusion, problem assignments are an important tool in the development of mathematical thinking skills of high school students. They form the skills of independent thinking, analysis, creative approach and teamwork in students. Also, problematic assignments serve to increase the interest of students and deepen their knowledge. Therefore, it is important to pay special attention to problematic assignments in the educational process, to effectively include them in the curriculum and to improve the skills of teachers in this regard. This in turn contributes to the further development of mathematical knowledge and thinking skills of Lyceum students.

**REFERENCES**

1. Jumayeva M.E., Tadjieva Z.G'. Methodology of teaching mathematics in elementary grades. Jizzakh: publishing house of Jizzakh State Pedagogical Institute, 2020. – 184 b.
2. Karimov A., Tursunov D. Methods for the development of Mathematical Thinking in high schools. Tashkent: National University of Uzbekistan press, 2018. – 156 b.
3. Rasulov B. Develop students ' creative thinking skills in mathematics. Tashkent: teacher publishing house, 2020. – 198 b.
4. Islamov S., Kadyrov N. Formation of independent thinking skills of students on the basis of problematic tasks. Samarkand: Samarkand State University Press, 2021. – 142 b.
5. Tursunova D. Modern pedagogical technologies in the teaching of mathematics. Tashkent: teacher publishing house, 2019. – 210 b.
6. Mirzaev O., Yusupova L. Innovative methods in the development of mathematical skills of Lyceum students. Bukhara: Bukhara State University Press, 2019. – 175 b.
7. Karimova G., Ergashev M. Experiments on the application of problematic assignments in mathematics lessons. Namangan: Namangan State University Press, 2017. – 160 b.
8. Abdullayev T. Problematic teaching methods in mathematics education. Tashkent: publishing house of the Academy of Sciences of Uzbekistan, 2018. – 190 b.