

ORGANIZING MATHEMATICS LESSONS BASED ON A COMPETENCY-BASED APPROACH

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Abstract: *This article discusses the importance of organizing mathematics lessons on the basis of a competency-based approach. In modern education, it is not enough for students to memorize formulas and solve standard exercises. They should also be able to apply mathematical knowledge in real-life situations, think logically, analyze problems, and make independent decisions. A competency-based approach helps teachers connect mathematical concepts with practical tasks and everyday experiences. In mathematics lessons, this approach develops students' problem-solving skills, critical thinking, communication, and ability to work with information. The article also highlights the role of interactive methods, group work, practical exercises, and assessment criteria in forming mathematical competence.*

Key words: *Mathematics education, competency-based approach, mathematical competence, teaching methods, problem-solving skills, practical learning, critical thinking, student-centered learning, interactive methods*

Main Part

The competency-based approach in mathematics lessons focuses not only on giving theoretical knowledge, but also on developing students' ability to use this knowledge in practical situations. In traditional lessons, students usually memorize formulas and solve similar exercises. However, in competency-based teaching, students learn to understand the meaning of mathematical concepts, choose suitable methods, explain their solutions, and apply mathematics in real-life contexts. According to the OECD PISA framework, mathematical literacy means the ability to reason mathematically and to formulate, use and interpret mathematics in different real-world situations [1]. Therefore, mathematics lessons should develop not only calculation skills, but also logical thinking, problem-solving and decision-making abilities.

For example, when teaching percentages, the teacher should not limit the lesson to the formula:

$$\text{Percentage} = \text{Part} / \text{Whole} \times 100$$

Instead, students can be given a real-life task:

Example:

A shop gives a 20% discount on a school bag that costs 150,000 soums. How much money will the buyer pay after the discount?

In this task, students first find 20% of 150,000 soums:

$$150,000 \times 20 / 100 = 30,000 \text{ soums.}$$

Then they subtract the discount:

$$150,000 - 30,000 = 120,000 \text{ soums.}$$

Through this example, students understand how percentages are used in everyday life. This develops their practical mathematical competence and financial literacy.

Another important feature of the competency-based approach is the connection between mathematics and students' life experience. UNESCO emphasizes that competency-based education should help learners use knowledge, skills and values in meaningful situations [2]. In mathematics lessons, this can be achieved through life-based problems, practical exercises, projects and group work.

For example, while teaching area and perimeter, the teacher can organize a practical task:

Example:

Students are asked to calculate how much carpet is needed for a classroom with a length of 8 meters and a width of 6 meters.

First, students use the area formula:

$$\text{Area} = \text{length} \times \text{width}$$

$$\text{Area} = 8 \times 6 = 48 \text{ m}^2.$$

Then they discuss how this mathematical result can be used in real life. For instance, if one square meter of carpet costs 85,000 soums, students calculate the total cost:

$$48 \times 85,000 = 4,080,000 \text{ soums.}$$

This kind of task helps students see the practical value of mathematics and develops their ability to connect mathematical knowledge with economic and everyday situations.

The competency-based approach also requires active teaching methods. Students should not be passive listeners; they should participate in discussions, solve problems together, compare different solutions and explain their reasoning. The National Council of Teachers of Mathematics states that effective mathematics teaching should support problem solving, reasoning, mathematical communication and the use of different representations [3]. Therefore, teachers should use methods such as group work, pair work, problem-based learning, mathematical games and project tasks.

For example, in a lesson on linear equations, students can work in groups and solve a practical problem:

Example:

A taxi service charges 8,000 soums for the starting fee and 3,000 soums for each kilometer. How much will a passenger pay for a 10-kilometer trip?

Students can form the equation:

$$y = 8000 + 3000x.$$

If $x = 10$:

$$y = 8000 + 3000 \times 10 = 38,000 \text{ soums.}$$

After solving the task, students can discuss how the same equation can be used for different distances. This develops algebraic thinking and shows the connection between equations and real-life situations.

Assessment is also an important part of competency-based mathematics education. In this approach, assessment should not measure only the final answer. It should also evaluate how students understand the problem, choose a method, explain their solution and apply knowledge correctly. Formative assessment helps teachers identify students' difficulties during the learning process and provide timely support [4]. For example, after solving a word problem, the teacher may assess students according to the following criteria:

1. Understanding the condition of the problem;
2. Choosing the correct mathematical method;
3. Performing calculations correctly;
4. Explaining the solution clearly;
5. Connecting the result with a real-life situation.

For instance, if students solve a problem about family expenses, the teacher should pay attention not only to the numerical answer, but also to the student's ability to explain the steps of the solution. This makes assessment more meaningful and fair.

Digital technologies also play an important role in organizing mathematics lessons based on a competency-based approach. Tools such as GeoGebra, interactive boards, online quizzes, Google Forms and virtual simulations help students visualize mathematical concepts and check their understanding. Digital resources can make abstract topics more understandable, especially in geometry and functions [5].

For example, when teaching graphs of linear functions, the teacher can use GeoGebra to show how the graph changes when the coefficient changes:

$$y = 2x + 1$$

$$y = 3x + 1$$

$$y = -2x + 1.$$

Students can observe the movement of the graph and understand the role of coefficients. This visual method helps them develop analytical thinking and mathematical observation skills.

Thus, organizing mathematics lessons on the basis of a competency-based approach helps students become active learners. They learn not only to solve mathematical exercises, but also to think critically, work with information, communicate their ideas and apply knowledge in practice. Such lessons prepare students for real-life situations and future professional activities.

Conclusion

In conclusion, organizing mathematics lessons based on a competency-based approach is an important way to improve the quality of modern education. This approach helps students not only learn mathematical rules, formulas, and concepts, but also use them in real-life situations. As a result, learners develop logical thinking, problem-solving skills, independent decision-making, and the ability to explain their ideas clearly.

The competency-based approach makes mathematics lessons more practical and meaningful. Through life-based tasks, group work, interactive methods, and digital tools, students understand that mathematics is closely connected with everyday life, future

professions, economics, technology, and social activities. For example, solving problems related to discounts, family budgets, area calculation, transport costs, or graphs helps students see the practical value of mathematical knowledge.

Another important aspect of this approach is assessment. In competency-based mathematics education, teachers should evaluate not only the final answer, but also the process of solving the problem, the student's reasoning, creativity, and ability to apply knowledge. This makes the learning process more effective and student-centered.

Thus, the competency-based approach in mathematics lessons supports the development of mathematical literacy and prepares students for real-life challenges. It helps to form active, independent, and competent learners who can use mathematical knowledge effectively in different situations. Therefore, this approach should be widely used in mathematics teaching practice.

REFERENCES

1. OECD. *PISA 2022 Assessment and Analytical Framework*. OECD Publishing, 2023.
2. UNESCO. *The Why, What and How of Competency-Based Curriculum Reforms*. UNESCO International Bureau of Education, 2017.
3. National Council of Teachers of Mathematics. *Principles to Actions: Ensuring Mathematical Success for All*. NCTM, 2014.
4. Black, P., & Wiliam, D. "Assessment and Classroom Learning." *Assessment in Education: Principles, Policy & Practice*, 1998.
5. Hohenwarter, M., & Jones, K. "Ways of Linking Geometry and Algebra: The Case of GeoGebra." *Proceedings of the British Society for Research into Learning Mathematics*, 2007.