COMPETENCE IN SOLVING MATHEMATICAL PROBLEMS FOR PRIMARY STUDENTS

Mukhammadieva Dilshoda
Student of the Faculty of Mathematics and Informatics of Jizzakh State Pedagogical University
Email: muxammadiyevadilshoda1@gmail.com

Abstract *As regards mathematics instruction in schools, math problem solving plays an integral part in shaping and enhancing mathematical skills for learners. In that process, knowledge mobilization has an indispensable role to play in students' attempts to give correct answers to their math exercises. It is therefore, of paramount importance to find alternative ways of improving students' competence in mobilizing knowledge, all for the sake of boosting their mathematical problem-solving skills.*

Keywords *knowledge mobilization, ability in solving mathematical problems, math problem solving, mathematics instruction.*

Аннотация *Что касается преподавания математики в школе, то решение математических задач играет важную роль, участие в формировании и совершенствовании математических навыков учащихся. В этом процессе мобилизация знаний играет незаменимую роль в попытках учащихся дать правильные ответы на математические упражнения. Это поэтому первостепенное значение имеет поиск альтернативных путей повышения компетентности студентов. в мобилизации знаний, и все это ради повышения их навыков решения математических задач.*

Ключевые слова *мобилизация знаний, способность решать математические задачи, математическая задача решение, инструкция по математике.*

In the process of training problem-solving skills, fostering the ability of knowledge mobilization for students is considered as a major content. Therefore, studying the implementation measures to improve the quality of teaching mathematics in general and improving the ability of knowledge mobilization in math problem solving in particular is essential and meaningful.

In "How to solve a math problem?" G. Polya proposed a method to solve a general math problem with four steps:

Step 1: Clearly comprehending about the math problem;

Step 2: Building a mathematical problem-solving program;

Step 3: Implementing the solving plan;

Step 4: Evaluating the answer.

With his theoretical conclusions, Polya created a general mathematical teaching method which not only aims to solve a single math problem, but also bring arguments and reasons in mathematical problem-solving process. In other words, educator G. Polya hopes to be able to help pedagogues who want to develop math skills for their students and help students to develop their math skills.

In 4 steps that G. Polya proposed, step number 2 "Building a mathematical problem-solving program" is actually a unified step between the dialectic logic and the formal logic. The formal logic addresses the "structure" of the plan (the form of the plan) while the dialectic logic indicates the specificity, feasibility and method of implementing the mathematical problem-solving plan (the content of the plan). Thus, building a mathematical problem-solving plan is mainly to propose the strategy to solve the math problem. For this process to be effective, students must think in a number of following orientations:

– Have I seen this math problem yet? Or this math problem is in a different form? Is there any problem related to this?

– Is this math problem related to the problem that I have solved? Can its solution and result be used?

– If this math problem has not solved yet, is there any related problem that is easier? Or this may be a particular case? Or a similar problem?

– Can I solve a part of the problem? Or should I retain a part of the condition and ignore the other part? Can I extract a useful factor from data?

– Did I use all the conditions? Did I pay attention to every major concept in the math problem?

The characteristics of mathematics are system and continuity. The mathematical knowledge is arranged in a strict system. The later knowledge is formed on the basis of existing knowledge. An earlier concept and its properties must be clearly understood in order to comprehend the later concepts. Therefore, students need to understand and grasp each knowledge as the basis for receiving other new knowledge: the process of continuous learning is a stage in the thinking process which is the basis of the math problem solving.

In mastering the knowledge, understanding and comprehending the concepts play a leading role. From the definition of each concept we can detect its property and its relation to other concepts in the same array of knowledge.

In many cases just because students do not understand the concepts, they have solved the problems wrong or could not find the solution. For example, students who do not know the formula of triangular area can not solve problems related to the triangular area or the length of triangular edge. Unable to grasp the method of numerical structure analysis, students have difficulty in solving numerical problems. In contrast, understanding the concepts and comprehending formulas will help students to solve math problems related to triangular area, calculate the length of edges by triangular area and compare the area. Students can even solve advanced problems such as calculating area of the shapes that can be inferred as triangular area; grafting the shapes base on their area; calculating the ratio area of the shapes.

Teachers can exploit the applications of concepts, rules and formulas by integrating plentiful application exercises. When exploiting the applications of concepts, rules and formulas, teachers need to pay attention to the level of each student to adjust the "dose of knowledge" and appropriate method of comprehending knowledge.

For example: Giving a sequence of numbers: 4, 8, 12, 16, 20, ...

a) Are numbers 182 and 64 included in the given numerical series?

b) If they are, what are their order number in the sequence?

c) What is the 121th number of the sequence?

Students may make the following answers:

a) The above sequence of numbers defines the rule: "Each term of the series is divisible by 4."

Number 182 divides into 4 makes 45 and surplus is 2, that is, 182 is not divisible by 4.

So, the number 182 is not included in the given numerical series.

b) Again we have: "Each term of the series equal to its order number multiplies by 4"

64 = Order number (64) × 4

So the order number of 64 is: 64: 4 = 16

c) Due to "Each term of the series equal to its order number multiplies by 4", the 121th number of the sequence is: 121: 4 = 484

Typical mathematics is the basic part of the math problem solving in elementary school which aims to introduce some basic math problems and the solving methods, so practicing this type of math helps to increase the knowledge to solve math problems and practice mathematical problem-solving skills for students. This is one of the factors that help students increase their ability to mobilize knowledge. In this respect, typical math problems can be considered as an additional problem or an intermediate step in the process of solving other problems.

When students study a particular form of typical math problem, the teacher should pay attention to explore all the specific forms of the problem, arrange them logically and reasonably in the form of a series of related problems to help students increase their ability of knowledge mobilization, improve their mathematical problem-solving competence.

Conclusion Knowledge mobilization plays a crucial role in the thinking process to find solutions. In order to mobilize knowledge, students must practice math problem solving on a regular basis according to scientific methods developed by the teachers' pedagogic intention design. If students have a learning process that regularly learn from experience, the process of mobilizing knowledge would be quicker and the knowledge that they have mobilized is indeed the necessary knowledge. Researching to find solutions to improve the ability of knowledge mobilization to increase the mathematical problem-solving competence for students is always a big question that need to find the answer.

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