MODELING PROBLEMS OF LOGICAL THINKING IN PRIMARY CLASS MATHEMATICS LESSONS

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ABOUT ARTICLE

Abstract: Models are created for various purposes (analysis of the studied processes, verification or demonstration of a new idea, method, system; to study and change reality, as a means of forecasting) and in a clear and concise form the studied system, process, characteristics of the idea; allows you to get important things about the connections and relations of the object. V.V. According to Davydov, the model will contain an image of the studied object. According to the nature of the description of the modeled system, there are modeling of the structure (structural models) and modeling of the operation of the processes occurring in it (flow or process models). To solve the second problem, mathematical modeling is the most effective. Modeling involves the use of abstraction and idealization. Reflecting the essential features of the original, the model acts as a kind of implementation of abstraction. The effectiveness of modeling as an achievement of consistency between model and reality is complicated by uncertainty, an important feature of models in the humanities. E. N. Gusinsky, studying the characteristics of social and humanitarian systems, emphasizes that they always have conscious and unconscious motives, are determined not only by past experience, but also are influenced by many factors of the current environment and the external environment. A.N.

Dakhin emphasizes the complexity of modeling humanitarian systems, because they do not have clear components that make up the system - each of the components can "over time" become a pedagogical bifurcation point and dominate the design of goals and teaching technology.

This article talks about the modeling of logical issues, the need for its application, the diversity of educational content, and the increase in requirements for the quality of education.

INTRODUCTION

On July 9, 2019, President Shavkat Mirziyoyev announced "State support for the further development of mathematics education and sciences, as well as measures to fundamentally improve the activities of the V.I. Romanovsky Institute of Mathematics of the Academy of Sciences of the Republic of Uzbekistan signed the decision. Forming the knowledge and skills of schoolchildren, educating them in the spirit of loyalty to national and universal values, increasing the prestige of the teaching profession and the quality of pedagogues, improving textbooks and educational methodical complexes based on the requirements of the times, bringing school educational institutions to international standards. in order to establish responsive modern models, as well as in accordance with the state program for the implementation of the Development Strategy of New Uzbekistan for 2022-2026 in the "Year of Honoring Human Values and Active Neighborhoods":

In 2022 - 2026, in accordance with the National Program for the Development of School Education (hereinafter referred to as the "Development Program"), the National Curriculum developed on the basis of international best practices for school education as the main directions of the development program full implementation and implementation of modern textbooks created by local and foreign authors, increasing the prestige of the teaching profession in society, creating favorable social conditions for pedagogues and adequately encouraging their work, the role of teachers in providing education and training to young people A number of efforts are being made to increase their responsibility and demand for continuous professional development.

METHODS

Problem solving and mathematical modeling. Problem solving and mathematical modeling involve two main methods: solving mathematical problems and solving real-world problems using mathematical methods. Both processes require mathematical analysis, logical thinking, and modeling skills. Let's take a closer look at them:

Problem solving. Problem solving is the process of solving a specific problem using specific mathematical methods. This includes the following steps:

1. Understanding the problem: It is necessary to understand the problem and define its main goals. For example, understanding how an equation or expression works.

2. Creating mathematical models: Trying to understand the problem through mathematical modeling. For example, creating equations or graphs for a problem.

1. Choosing a solution: Choosing the right method or algorithm to solve a problem. It can be algebraic methods, geometry, statistical analysis, etc.

2. Implementation of the solution: Applying the chosen method or algorithm and calculating the result.

3. Check the result: Check the correctness of the solution and, if necessary, revise the calculations.

Mathematical modeling. Mathematical modeling is the process of analyzing and solving real-world problems using mathematical methods. This includes the following steps:

1. Problem definition: Identifying a real-world problem or process and creating a mathematical representation of it.

2. Creating a mathematical model: Transforming the problem into a mathematical model. Equations, functions or statistical models can be created for this.

3. Analyzing the model: Analyzing the creative mathematical model and checking its accuracy. For example, comparing model results with real data.

4. Model Tuning: Further fitting and tuning of the model with real data. This usually requires changing the parameters of the model.

5. Using the model: Applying the created model to solving a real problem and evaluating the results. Mathematical modeling is used in various fields, such as economics, engineering, biology, social sciences, etc. It helps you better understand real-world processes and helps you make decisions.

Singapore's mathematical literacy is highly regarded globally and is one of the successful parts of the country's education system. Singaporean mathematics education is mainly known for the following aspects:

1. Educational programs. Singapore's mathematics curriculum is robust and structured.

The curriculum includes in-depth study of mathematical concepts and strengthening them through practical exercises.

Program:

• Reinforcement of secondary mathematics: Students are focused on a deeper understanding of mathematics from the elementary grades.

• Problem Solving Strategies: Emphasis is placed on generating and analyzing problems, logical thinking, and creative approaches.

2. Teaching methods. Singapore uses the "Mathematics 3D" methodology in mathematics education:

• Model-Diagram (Model-Method): Helps students understand mathematical problems through visual models. For example, "bar charts" are used to represent issues graphically.

• Problem Solving: Students are taught different techniques to help them solve different types of problems.

• Effective Teaching: Teachers use effective strategies and innovative methods to motivate students to better understand mathematics.

3. A well-studied system of education. Singapore's mathematics education system includes the following elements:

• Teacher training: Teachers receive advanced training and are familiar with the latest methods in mathematics education.

• Guides and resources: There are well-developed guides, textbooks and online resources for mathematics education in Singapore.

4. International assessment. Singaporean students consistently perform well in international assessments, particularly PISA (Programme for International Student Assessment) and TIMSS (Trends in International Mathematics and Science Study). These results confirm the high quality of mathematics education in Singapore.

5. Innovation and research. Singaporean mathematics education is constantly being innovated and researched. New methods are tested to improve curricula and teaching methods.

6. Individualization of education. In Singapore, it is important to support students based on their individual needs. It helps in developing students' mathematical skills and makes it possible to maximize the potential of each student.

Individual approach: There are learning methods and support tailored to the individual needs of students. This will help to maximize the potential of each student. For example, Singapore math programs:

• "My Pals Are Here!": A series of tutorials aimed at teaching students mathematical concepts in a fun and interactive way.

• "Singapore Math": A guide and resources developed for the application and teaching of Singapore Math programs internationally.

In PISA studies, real-life problem situations presented in a context are given, not the usual mathematical problems in our textbooks. We remind you that in a typical standard math problem from our textbooks, there are given quantities (knowns) and an unknown quantity to be found. It is required to find the unknown using the given information. In this case, the givens are enough to find the unknown, and they are neither too few nor too many. PISA tasks are not a mathematical problem, it consists of the stage that comes before the mathematical problem - the description of the problem situation (context). It is necessary to study the problem situation described in the context of the task by reasoning and express it in mathematical language, that is, to bring it to a mathematical problem. Only after that, the problem will be solved with the help of mathematics.

Mathematical literacy means solving problems using mathematics on the one hand, and mathematical reasoning on the other. Mathematical reasoning is strongly emphasized in PISA research as an important central aspect of the problem-solving cycle. Mathematical literacy includes students' activities such as "expressing the problem in a given life situation in mathematical language (mathematical modeling)", "applying mathematics", "interpreting and evaluating the found mathematical solution in relation to the given problem" based on mathematical reasoning. . Below, for the sake of brevity, we refer to these activities as "reasoning", "expressing", "applying" and "interpreting and evaluating".

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