

MODELS AND METHODOLOGICAL OBJECTIVES OF THE COURSE DESCRIPTION OF THE MATHEMATICAL MODELING SCHEDULES FOR PRIMARY CLASSES

Sobirov Sardor Jumanazarovich
Urgench is a teacher of the State University
UZBEKISTAN, Nukus

ABSTRACT

This article discusses models and their methodological capabilities in math modeling skills for primary school pupils. There is also an analysis of the sources, types, functions, and philosophical-psychological aspects of modeling.

Keywords: Mathematical model, modeling method, skill, model types, modeling functions, teaching method, mathematical modeling, drawing models, subject models, graphic models, educational model.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

The method of modeling is one of the methods of learning the role of the learning process. From the early stages of the human society, well-known philosophers Democritus, Epicurus, and Lucrecius have used modeling techniques in their own vision. They illustrate the interrelationship between objects and objects in objects using models. I. Newton was able to model the model as the first one. He tried to justify the conditions of two similar systems in his work "The Beginning of Mathematics in Natural Philosophy" [1]. This has allowed describing modeling as a scientifically-based method.

In the 20th century, modeling began to grow in its widespread development. This method has played an important role in all aspects of science. Although modeling has been studied over a long period of time, it has just begun to be recognized as a method and tool for teaching. Therefore, in the pedagogical and psychological sources, there are different interpretations of the term "model".

VS Schottfall evaluates the model as an intellectually, financially viable system. An example of a model that describes and describes the subject of research, and as a result of studying, the person acquires new knowledge of the subject. [2]

The model of L.M. Friedman is a means of knowing which can replace the natural phenomenon of practice or knowledge; is a system of specific relationships or companions. It describes the features of its prototype and, at the same time, corresponds to the original as a research object [3].

P.V.Gres understands the material and intellectual expression of the object under the concept of the model. The model substitutes the object during the learning process and retains the features required for a particular research. Modeling and operation of the model is called modeling [4]. Aiuemov evaluates the model as a system. In the framework of this approach, the system will appear as a means of getting information from another system [5].

The modeling problem is a relative phenomenon in all aspects of the learning process. Various experts have addressed the modeling case. Most of them approve the interpretation offered by W. Schthoff. Based on the goals and objectives of our study, we have addressed this statement.

First of all, the model allows students to explain how the object being constructed is structured. Using this model, learners will learn the structure, features, developmental rules of the object. As a model of a particular object, the teacher can use images, drawings, layouts, layout views of different things and objects. Teachers should be aware that models cover only certain objects. Specific features of the objects that are modeled should be reflected in it.

Under the modeling concept, the teacher also needs to understand the peculiarities of the particular object, the structure, the relationships with other objects, and the relevance and accessibility of a particular object. It should be noted that mathematical models play an important role among many different models. Therefore, it is crucial for students to develop mathematical modeling skills from their primary grades.

L.P.Stoylova understands that a certain process is expressed in mathematical language within the framework of mathematical modeling [6]. Mathematical models include numerical expressions, mathematical speech, relationships, theories. In contrast to the natural sciences and social sciences, the mathematical model does not require the creation of material objects. Other teaching subjects deal only with model research, mathematics, which deals with learning "model models." Therefore, the content of the mathematical curriculum has specific didactic capabilities in shaping students' modeling skills.

All models can be modeled on patterns and brands. These characters serve as an important tool for creating models. Patterned models are divided into graphic and graphic models. This division is carried out on the basis of what they do. Predmetal models provide activities that are carried out by means of materials and materials. These models are composed of different materials. For example, there are countless wagons, buttons, and various forms of paper. Among these models, there are some specific situations in which ideas are created. These models are described and described in the form of mathematical issues.

Graphic models are mainly used in imagining and drawing situations. Graphic models include pictures, conditional images, drawings, or chart schemes. Models can be used in daily and math speech. Brands used in everyday speech include short stories and tables. Mathematical models with mathematical speech models can be added to mathematical models. Among such models, there are also expressions, equations, equations, and inequality.

Any short record of pictures or drawings is a model of problem solving. When it comes to textual issues selected as auxiliary models, all its objects must reflect the relationship between them. All the requirements in these texts should be clearly stated. These models will be reflected in the content of the tasks, their discussion and solution. At the same time, these models allow for a thorough and thorough analysis of the students' tasks.

It should be noted that, under the conditions of the same issue, it is possible to create more than one model. Each one of them requires a way to solve the problem. As a result, students have the ability to model and use them as a method of scientific knowledge. Therefore, misinterpretation of the model and the concept of modeling are only a misconception. The demonstration of mathematical models of different models and the accurate reflection of the modeling processes in the eyes of the reader will help them to effectively solve the problem

and problem solving. Students should be able to build models independently and solve issues based on their models in grades 3-4. They encourage learners to reasonably think, by making sure they are learning specific subjects by modeling them. At the same time as a modeling skill, students also acquire the ability to apply this method to their everyday life and future work experience. During math problem solving, students are aware that models represent specific objects. As a result of mastering mathematical modeling, students gained knowledge, knowledge, skills and skills.

Mathematical models have their own description and specific functions. Modeling is a multifunctional phenomenon that can be used at different purposes and levels for research. As well as the centuries-old experience of using models, they have created many forms and types.

The classification of the models is based on the signs of the objects they represent. The analysis of sources that reflects the philosophical and psychological aspects of this modeling has been evident. They have different types of models based on different criteria.

In his research, LM Fridman classed certain types of models [3]. From the point of view of the exhibition, it has two types of models: material (things-based, clear); imaginary models (ideal).

Material models include models that contain specific things. For example, metal, wood, glassware. Among these models, living things are also included in the study of specific events and processes. Material models are divided into stable, non-moving and moving models. Fridman introduced geometrically similar models of the object into statistical models. Such models serve the formation of spatial figures in students. Because they represent the spatial form of objects and reflect their scale. It introduces models that represent specific processes and events to dynamic models.

Ideal models are divided into several types: in the form of imagery models or pictures; in the form of symbols or marks; intellectual or mental appearance.

Illustrated models include pictures, drawings, landscapes that describe the composition and features of various events and processes. Symbolic models include records that describe the nature and content of the object modeled in mathematical speech. Reflective designs serve to formulate a clear picture of a particular phenomenon, process, object, and material [3; 26-27].

The classification of the models by LM Friedman allows you to imagine two basic functions: practical function as a tool and tool of scientific experiment; as a distinctive feature of material existence, theoretical and logical and theoretical function in the form of emotionally, abstract and clear, general and specific [3; 27-b.].

L.M. Fridman has highlighted the following features in the learning process:
studying scientific models;

build models and concepts that are not suitable for modeling or models that are not available for existing models;

creation of action formulas and algorithms within the models representing the basis and direction of actions;

Using models that help to generalize knowledge;

planning studies on the concepts examining the information provided;

modeling material that facilitates logical thinking and memorization [3; 29]. V.Kuznetsova and EAVolinkina also distinguished a number of models:

to make an idea of the model by describing the object being studied in the form of things, drawings, and symbols;
to create conditions for the study of natural sciences by re-creating models and relationships;
to carry out specific subject-matter movements by implementing models for solving private issues [7; 107].

These scientists have identified the specific didactic functions of mathematical modeling as follows:

1. Knowing function. The purpose of the function of knowing requires the identification of the studied object. This formality occurs on a regular basis from simple to complex.

2. The function of pupil management. Mathematical modeling is inherently characteristic and therefore includes reference, controlling, communicative activities. The reference movement includes descriptions corresponding to the situation being studied, as well as adding additional parts to them. Supervisory actions will help to identify shortcomings in the comparative analysis of the drawings and images included in the textbook. Communicative behavior is to identify and explore the outcomes of the students. Students will be able to describe the process or phenomenon described by the model in the process of doing these actions around the environment, classroom or self-explanatory, and explain.

3. The function of interpreting (interpretation, interpretation). It means to represent a single object with different models. Each of these models is interpreted as interpretation. It is important to give a different interpretation to the objects of particular importance. This interpretation allows the object to be understood from the different angles [7; 107-108]. NM Murzatina tried to find the following functions of mathematical modeling in her research: [8]

"Demonstration function. The student demonstrates the information that he / she uses in the modeling process. As a result, the student determines the outline of the object using the internal structure of the object, in which the words in the text are used by the student. They also have the opportunity to present the subject matter as an object of research and learning. "

"Description function. The reader tries to understand his / her own understanding of mathematical concepts previously learned and the relation between them. It helps to extend the experience of primary school students in dealing with a range of issues, eliminating their ability to deal with one type of problem. " "Proposition Function. The reader summarizes and evaluates the acquired knowledge of the subject and uses the subject as a means of collecting and rebuilding the subject. It provides opportunities to explore and find optimistic solutions based on different models. "

"Evristical Function. As a result of active intellectual work on the model, students are able to find ways and means that are not yet available to address issues. As a result, students will find new, unique ways and ways to solve problems. As a result, primary school pupils have the opportunity to look for other types of issues. This creates the general skills of primary school pupils to solve them based on the initial condition of the problem. "[8; 56-57).

Simultaneous use of some of the functions of mathematical models provides for the effective functioning of the students. At the same time, they attract the attention of the model to the model and create a favorable situation for them to get sufficient information about the object represented by this model. This way, the students will be relieved of their excessive voltage by drawing them into the learning model.

The models used to solve text arithmetic problems serve as means of learning activities and serve specific tasks:

- an object that allows you to see specific relationships at the object;
- demonstration, analysis, abstracting and summarizing the development of opportunities for action and action of methods.

As a result of step-by-step use of all the functions of mathematical modeling, elementary schoolchildren can effectively formulate mathematical modeling skills.

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