



ISSUES OF MODELING IMPROVEMENT OF THE SECONDARY EDUCATION SYSTEM

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Abstract

The essence and potential of modeling are analyzed and characterized. Key issues in modeling for improving the secondary education system corresponding to the variable model are outlined.

Keywords: Typology, classification, model, modulus, measure, sample, original, object, dynamic, static, task.

Introduction

Аннотации

Анализируются и характеризуются сущности и возможности моделирования. Намечаются основные вопросы моделирование по совершенствованию системы среднего образования соответствующее вариативной модели.

Ключевые слова: типология, классификация, модель, modulus, мера, образец, оригинал, объект, динамический, статический, задача.

Annotatsiya

Modellashtirishning mohiyati va salohiyati tahlil qilinadi va tavsiflanadi. O'zgaruvchan modelga mos keladigan o'rta ta'lim tizimini takomillashtirish uchun modellashtirishning asosiy masalalari bayon etilgan.

Kalit so'zlar: tipologiya, tasniflash, model, modul, o'lchov, namuna, asl, obyekt, dinamik, statik, vazifa.



The word "model" (from the Latin *modulus* - measure, sample) has several connotations and is used in many areas of science, engineering, production, and education. In a broad sense, it is a conventional image (picture, diagram, description, etc.) of an object (or system of objects), process, or phenomenon.

In scientific and technical research, a model is understood as a mentally represented system that, by displaying or reproducing the object of study, can replace it so that its study provides new information about that object. (V.A. Shtroff, *Modeling and Philosophy*. Moscow - Leningrad, 1966)

Modeling is a method for studying complex technical devices, structures, or processes using models of identical or different physical natures, using similarity theory when setting up an experiment and processing its results. This approach has become widespread in engineering and is based on replacing the physical process being studied with a similar process of the same physical nature and is used in the study of relatively simple systems. Thus, models:

- a) objectively corresponds to the object being studied and the original,
- b) can replace the original at some stages of the study
- c) can provide specific information about the original being studied.

The following basic operations are characteristic of a model experiment:

1. Transition from the object to the model – model construction (modeling in the proper sense of the word);
2. Experimental study of the model;
3. Transition from the model to the object, which consists of transferring the results obtained during the study to this object.

Modeling typology and the classification of modeling methods are discussed in the works of a number of researchers. Systemic ideas enable the creation of a structure for a formal approach to problem solving, where problem solving can be viewed as a goal, and systemic ideas as forcing relationships.

Output model conformity checking is an important operation and is included in all feedback subsystems. Conformity checking is performed for each input and for each output model. The presence or absence of conformity between the output and the output model is determined by determining the difference between the output and the output model, assessing the logic and significance of the observed difference, and formulating a decision based on the difference (linking the difference with the decision). The output model represents the expected outcome. It can be quantitative



or qualitative. A quantitative output model can express the expected outcome as a predicted value (profit, loss, discounted costs, specific technical indicators, etc.). This value, called an indicator, is recommended to be considered as a systemic process. At the final stage, the conformity of the generated indicator with the assessment of the object under study is verified.

The indicator is suitable for measurement to a degree appropriate to the conditions of the problem. There are two main approaches to overcoming the difficulties of metric selection. The first requires defining a large, complex problem using general metrics; the second involves breaking a large, complex system into smaller groups and developing suitable, specific metrics or criteria for each group. In each case, the problem can be solved by finding a system that is superior to the comparison system in each assessed characteristic. The advantages and disadvantages of each system must be considered and evaluated in terms of time, cost, and effectiveness.

The typology of modeling and the classification of modeling methods have been examined in the works of a number of researchers. The diagram presented in Figure 1 is the result of an analysis of existing developments. Depending on the modeling tools and construction methods, models can be divided into two classes, which include:

1. Material-influencing models;
2. Models based on mental representation.

Material models, in turn, are subdivided into three main groups.

1. Characterized by geometric similarity;
2. Models associated with physical similarity;
3. Mathematical models.

In general, modeling is a method for studying a real object (natural or artificial (reduced or vice versa)), based on using the object in its own way or with additional (intermediate) tools. Accordingly, every properly conducted experiment requires the use of a model. The obtained result relates not only to a single phenomenon and experiment, but even characterizes all classes related to an event, occurrence, or property.

The basic operations for model experiments relate to:

1. Constructing a model, that is, expressing ideas through words, modeling, and moving from object to model;
2. Investigating the model experimentally;



3. Conducting research on the object using this model.

In practice, three modeling methods are used: complete, incomplete, and approximate. In complete modeling, the processes characterizing the phenomena under study change similarly in both time and space. In incomplete modeling, the processes characterizing the phenomenon under study are partially similar. In approximate modeling, there are no similarity relationships between some system parameters or some parameters of their modes.

Models can be dynamic (active) and statistical (non-active). It should be noted, however, that similarity theory and the modeling based on it do not fully reflect all aspects and details of the phenomena under study. The presented systemic analysis of modeling allows us to define the essence of modeling for the theory and practice of improving the general secondary education system. In studying the conditions of the general secondary education system, we came to the conclusion that the work of teachers in this system is a complex and never-ending process that requires teachers to have sound professional knowledge of child psychology and learning, as well as ongoing collaboration with parents. However, the problematic area of the general secondary education system remains, on the one hand, the definition of a rational model for creating conditions for teachers to find individual educational trajectories to meet their professional and creative needs, and on the other, the insufficient development of the model for teacher training to support individual student development.

Today, improving modeling is a priority in all systems and at all levels of education. The general education system serves as a vehicle for identifying, supporting, and developing gifted students to create and maintain high levels of scientific, technical, cultural, educational, and managerial progress in the country.

Consequently, high demands are placed on the quality of student preparation, the professional training of teachers, the professional translation and development of individual educational programs, and the creative organization of the educational process.

This foundation and direction served as the prerequisite for developing a variable model for improving the general secondary education system, built on the principles of cultural conformity, personal orientation, and consistency.

Components of the model for preparing teachers to work with students in the general secondary education system: determining the level of professionalism, professional



competence, and the development of creative potential in working with students; enhancing professional competence and developing creative potential in working with students. This model includes a number of conditions:

1. Organizing freedom to choose an individual general secondary educational trajectory towards self-development, self-actualization, personal education, and a professional career.
2. Building on the existing level of professionalism, professional competence, creative potential, and practical experience of teachers, and working with students to enhance and expand these through the general secondary education system.
3. Creative interaction and collaboration in the search for alternative approaches to student learning and development.
4. Creating an enriched methodological base for teachers to navigate the rich information flow on issues of student identification and development. Sections of the methodological base: "Students (schoolchildren) - a priority area of modern general secondary education."

"Modern pedagogical technologies of teaching and upbringing applied in working with students in the general secondary education system." "Psychologist - pedagogical support for the individual educational model of student development in the general secondary education system." "A system of consulting and training for teachers of general secondary education." "Methodological recommendations for teachers on working with students in the general secondary education system."

The main goal of the model is to prepare gifted students, individuals of culture, and develop students' creative abilities in the general secondary education system.

The objectives of the variable model are:

1. To develop teachers' knowledge of the essence of foreign and domestic concepts and theoretical principles of student development.
2. To instill the ability to identify problems, formulate, and solve tasks that arise during educational activities and student development.
3. To improve teachers' skills in identifying methods and technologies for student development, modifying existing ones, and developing new ones.
4. To develop teachers' abilities to design, model, and diagnose the process of implementing individual educational trajectories for gifted students and teachers in the general secondary education system.



In conclusion, we note that the technological component (developmental and assessment) of the variable model in the general secondary education system presupposes not only a certain ideology of humane interaction between teacher and student in the educational process, but also norms of interaction that are expressed in the results of student learning and development. The role of regulating the activities of educational entities is assigned to standardization - the development and practical use of regulatory documents that define the requirements for the quality of the general secondary education system.

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