IMPROVING MODELING OF THE SECONDARY EDUCATION SYSTEM

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Annotations. *The essence and capabilities of modeling are analyzed and characterized. The main issues of modeling for improving the secondary education system corresponding to the variable model are outlined.*

Key words: *typology, classification, model, modulus, measure, sample, original, object, dynamic, static, task.*

The word “model” (from the Latin Modulus – measure, sample) has several semantic connotations and is used in many areas of science, technology, production, and training. In a broad sense, it is a conventional image (image, diagram, description, etc.) of an object (or system of objects), process or phenomenon.

In scientific and technical creativity during research, a model is understood as a mentally represented system that, by displaying or reproducing the object of research, is capable of replacing it so that its study gives us new information about this object. (Shtroff V.A. Modeling and philosophy. M – L. 1966)

Modeling is a method of studying complex technical devices of structures or processes on their models of the same or different physical nature using the theory of similarity when setting up an experiment and processing its results. This approach in technology has become widespread 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 the models:

a) objectively corresponds to the original being studied;

b) can replace the original at some stages of the study

c) can provide certain information about the original being studied.

The model experiment is characterized by the following basic operations;

1. Transition from an object to a model – building a model (modeling in the proper sense of the word);

2. Experimental study of the model;

3. The transition from the model to the object, consisting in the transfer of the results obtained during the study to this object.

The typology of modeling and classification of modeling methods are considered in the works of a number of researchers, in which system ideas make it possible to create the structure of a formal approach to solving problems, and solving a problem can be considered as a goal, and system ideas as coercive connections.

The operation of checking compliance with the output model is one of the most important and is contained in all feedback subsystems. Compliance check exists for each input and for each output model. The presence or absence of a correspondence between the output and the output model is established by determining the difference

between the output and the output model, assessing the logic and significance of the observed difference, and drawing up a decision based on the difference (joining the difference with the decision). The output model represents the expected outcome. It can take quantitative or qualitative form. The quantitative form of the output model can express the expected outcome in the form of an expected value (profit, loss, present costs, specific technical indicators, etc.). Such a value is called indicators and is recommended to be considered as a system process. At the final stage, the compliance of the generated indicator with the assessment of the object under study is checked.

The indicator is suitable for measurement to the extent appropriate to the conditions of the problem. There are two main ways to overcome the difficulties of selecting indicators. The first method requires that a large, complex problem be defined using generalize indicators, in the second method, a large complex system is divided into small groups and suitable specific indicators or criteria are formed for each group. In each case, the problem can be solved by finding a system that is better than the system being compared with each characteristic being assessed. It is necessary to consider the advantages and disadvantages of each system and evaluate them in terms of time, cost and effectiveness.

The typology of modeling and classification of modeling methods are considered in the works of a number of researchers. The diagram presented in Fig.

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, they include: 1. Materially affecting;

2. Models based on mental representation. Material models, in turn, are divided into three main groups:

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

In general, modeling is a method of studying a real object (natural or artificial (reduced or vice versa), based on using the object in its own way or using additional (intermediate) tools and, accordingly, every correctly conducted experiment requires the use of a model. And the result obtained refers not only to the same phenomenon and experience, but even characterizes all classes related to an event, incident, property.

The main operations for experiments in the model relate to:

1. Building a model, that is, expressing ideas through words, modeling and moving from object to model;
2. Study of the model in experiment;
3. Conducting research on the object using this model.

In practice, three modeling methods are used: complete, incomplete and approximate. With complete modeling, the processes characterizing the phenomena under study change similarly in both time and space. With incomplete modeling, the

processes characterizing the phenomenon under study are partially similar. In approximate modeling, there are no similarity relationships between some parameters of systems or some parameters of their modes. Models can be dynamic (active) or statistical (not active). It should be noted, however, that the theory of similarity and the modeling based on it do not reflect with absolute completeness all aspects and details of the phenomena being studied. The given systemic analysis of modeling allows us to determine the essence of modeling in theory and practice for improving the general secondary education system.

In the process of studying the conditions of the general secondary 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 good professional knowledge in the field of psychology of children and their education, and constant cooperation with parents.

However, the problem field in the general secondary education system remains, on the one hand, the definition of a rational model for creating conditions for teachers to find an individual educational trajectory to satisfy their professional and creative needs, on the other hand, the insufficient perfection of the model for training teachers to provide individual routes for students.

Today, issues of improving modeling are a priority in all systems and at all levels of education. The general education system acts as a grantidentifying, supporting and developing gifted students to create and maintain the country's scientific, technical, cultural, educational and managerial progress at a high level. In connection with these, high demands are placed on: the quality of student training; professional training of teachers; professional broadcasting and development of individual educational programs, creative organization of the educational process.

This basis and direction served as a prerequisite for us to develop 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 development of the teacher's creative potential in working with students; increasing professional competence and developing the creative potential of the teacher in working with students.

This model includes a number of conditions:

1. Organization of freedom to choose an individual general secondary educational trajectory on the path to self-development, self-actualization, one's own education, and professional career.

2. Reliance on the existing level of professionalism, professional competence, development of creative potential and practical experience of the teacher, and work with students in order to improve and expand them through the secondary education system.

3. Creative interaction and collaboration in finding alternative approaches to student learning and development.

4. Creation of an enriched methodological base for free orientation of teachers in a saturated information flow on the problems of identifying and developing students. Sections of the methodological base: “Students (schoolchildren) are a priority direction of modern general secondary education.”

“Modern pedagogical technologies of training and education used in working with students in the general secondary education system.” “Psychologist – pedagogical support of an individual educational model of student development in the general secondary education system”; “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, people of culture, and develop the level of creative ability of students in the general secondary education system.

The objectives of the variable model are:

1. To form among teachers a system of knowledge about the essence of foreign and domestic concepts and theoretical principles of student development.

2. Instill the ability to detect problems, formulate and solve problems that arise in the course of educational activities and the development of students.

3. Improve the skills of teachers in determining methods for identifying and developing technologies for students, modifying existing ones and developing new ones.

4. To develop the ability of teachers to design, model, and diagnose the process of implementing individual educational trajectories of giftedness for students and teachers in the general secondary education system.

In conclusion, we note that the technological component (developmental and control-evaluative) 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 identifying, supporting and developing gifted students to create and maintain the country’s scientific, technical, cultural, educational and managerial progress at a high level. In connection with these, high demands are placed on: the quality of student training; professional training of teachers; professional broadcasting and development of individual educational programs, creative organization of the educational process. This basis and direction served as a prerequisite for us to develop 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 development of the teacher’s creative potential in working with students; increasing professional

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In conclusion, we note that the technological component (developmental and control-evaluative) 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, which are expressed in the results of students' training and education. The role of regulating the activities of educational subjects is assigned to standardization - the development and use in practice of normative documents that define the quality requirements for the general secondary education system.

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