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USING MODELS IN TEACHING DRAWING

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ABSTRACT

This article discusses the use of models in teaching drawing. Examine basic modeling issues and describe the basics of modeling. Analyze the didactic potential of using models in the learning process. Consider the possibilities and methods of using modeling in drawing lessons.

KEYWORDS: ***drawing, modeling, learning process, method, methodology, information model***

DISCUSSION

Drawing is a subject in which students become familiar with a wide range of technical concepts. Knowledge of drawing facilitates the study of many other general technical subjects. The conditions for successful mastering of technical knowledge are the ability to read drawings and knowledge of the rules for the execution and design of drawings. The drawing is one of the main carriers of technical information, without which no production can do.

The need to depict objects appeared in people a long time ago. Even in antiquity, people depicted wild animals, hunting, etc. on stones. Later, similar images appeared on household items - vessels, vases and other utensils. This is how the first images of objects and phenomena that a person observed in the life around him appeared. In the process of human labor activity, it became necessary to depict objects and structures that did not yet exist. Such a task became, for example, before the architects in the construction of temples, theaters and palaces.

Drawings of plans and facades of buildings were known in Ancient Egypt, as evidenced by images of buildings on papyri that have come down to us. However, it took a long period of time before the separate images of the plan and the facade of the object were combined into a system of two types, i.e. drawing of an object in the modern sense of the word. Methods of depicting objects on a plane developed in their own ways from primitive and conventional sketches to more perfect ones, approaching modern projection drawings. A model in the general sense (generalized model) is a specific object created for the purpose of obtaining and (or) storing information (in the form of a mental image, description by symbolic means or a material system), reflecting the properties, characteristics and connections of the original object of arbitrary nature that are essential for the task , solved by the subject. For decision making theory, the most useful are models that are expressed in words or formulas, algorithms and other mathematical means.

The need for modeling arises in such areas as:

1) Cognition;

2) Communication (in the broad sense of the word)

3)Practical activities.

Aspects of modeling can be the appearance, structure, behavior of the modeling object, as well as all their possible combinations. The structure of an object is called the totality of its elements, as well as the links existing between them. The behavior of an object is the change in its appearance and structure over time as a result of interaction with other objects.

Appearance modeling is used to:

1) Identification (recognition) of the object;

2) Long-term storage of the image.

Object structure modeling is used to:

1) Its visual presentation;

2) Studying the properties of the object;

3) Identifying significant connections;

4) Studying the stability of the object.

Behavior modeling is applied when:

1) Planning, forecasting;

2) Establishing links with other objects;

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3) Identifying causal relationships;
4) Management;
5) Designing technical devices and so on.

In the process of modeling, each aspect of modeling is revealed through a set of properties.

Models reflect not all properties, but only those that are significant from the point of view of the modeling goals.

Each aspect of modeling is characterized by its own set of properties:

1) Appearance - a set of features;
2) Structure - a list of elements and an indication of the relationship between them;
3) Behavior - changes in appearance and structure over time.

Some properties of the modeling object can be expressed in quantities that take numerical values. Such values are called model parameters [2].

An information model can be viewed as some new information object, which, in turn, can also be an object of modeling.

Definition of the concept "model".

The model is:

1) Some simplified semblance of a real object;
2) Reproduction of an object in a reduced or enlarged form (layout);
3) diagram, image or description of any phenomenon or process in nature and society;
4) A physical or informational analogue of an object, the functioning of which according to certain parameters is similar to the functioning of a real object;
5) A certain object - a substitute, which under certain conditions can replace the object - the original, reproducing its properties and characteristics that are of interest to us, and has significant advantages and convenience (clarity, visibility, accessibility of tests, ease of operation with it, and so on);
6) A new object that reflects some aspects of the studied object or phenomenon that are significant from the point of view of the goals of modeling;
7) A new object (real, informational or imaginary), different from the original one, which has properties essential for modeling purposes and, within the framework of these goals, completely replaces the original object.

The model is the way knowledge exists.

Modeling goals

The solution to any practical problem is always associated with research, transformation of some object (material or informational) or management of it.

The goal of modeling arises when the subject of modeling solves the task assigned to him, and depends both on the problem being solved and on the subject of modeling. That is, the goal of modeling has a dual nature: on the one hand, it is objective, since it follows from the research task, on the other hand, it is subjective, since the researcher always corrects it depending on experience, interests, motives of activity.

For one object, one subject can build several models if he solves different problems leading to different modeling goals.

For one object, different subjects can build different models, even if they have the same modeling task. The choice of the type of model and its construction depend on the knowledge, experience, preferences, personal interests of the subject.

Different objects can have the same type of model, even if they were built by different subjects, based on different modeling goals.

The main stages of building models

- Simulation steps:
- Modeling goal setting
- Analysis of object modeling and selection of all its known properties
- Analysis of its selected properties from the point of view of the purpose of modeling and determination of which of them should be considered essential
- Choosing the model presentation form
- Formalization
- Analysis of the resulting model for consistency
- Analysis of the adequacy of the resulting model objects and modeling goals

There are no universal rules for determining which of the known properties of an object are essential for a particular case.

If the modeling conditions allow, it is recommended to build several models with different sets of "essential" properties and then evaluate them for their adequacy to the object and the purpose of modeling.

Types of models:

.By the characteristics of the object of modeling:

.1 Appearance Model.
.2 Model of structure.
.3 Behavior

.By areas of activity of the subject of modeling:

.1 Cognitive.
.2. Communicative.
.3. Models arising in the field of practice.

.In essence:

.1. Substance-energy (natural).
.2. Ideal (imaginary).
.3. Informational.

.By the role of object management:

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.1 Registrants.
.2. Reference.
.3. Prognostic.
.4. Imitation.
.5. Optimization.
.By the degree of formalization:
.1 Unformalized.
.2 Partially formalized.
.3. Formalized.
.According to the time factor:
.1 Static.
.2.Dynamic.
.2.1 Deterministic
.2.2 Stochastic (probabilistic).
Types of information models:
.Discriptive (expressed in the language of description):
.1 In natural language.
.1.1 Verbal Description
.2. In a special language.
.2.1.Scientific:
.2.1.1 mathematical formulas;
.2.1.2 algorithms.
.2.2.Technical:
.2.2.1 technical plans;
.2.2.2 programs.
.Mixed.
.1 Tables.
.2. Graphs.
.2.1 Trees
.2.2 Networks
.2.3 Block diagrams.
.3. Schemes.
.4. Maps.
.5. Videos.
. Visual (expressed in the language of presentation).
.1 Figures.
.2. Drawings.
.3. Graphics.
.4. Photos.

Formalization. In the process of cognition and communication, we are faced with formalization at almost every step: we formulate thoughts, draw up reports, fill out all kinds of forms, transform formulas.

In general, formalization is understood as the reduction of some content (content of a text, the meaning of a scientific theory, perceived signals, and so on) to a chosen form.

Example:

The table of contents of the book is the formalization of its content parts, and the text of the book itself can be considered as formalization by means of linguistic constructions of thoughts, ideas, and reflections of the author. The result of the formalization of a scientific theory is, as a rule, a set of formulas, graphs, diagrams, tables, and so on. As a result of formalization, the action plan is translated into an algorithm.

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