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FORMATION OF MODELING AS A LEARNING ACTION IN JUNIOR SCHOOLCHILDREN

***Summary.** The report identifies the problem urgency; the essence of the concept of "modeling action" has been revealed; the learning modeling actions and transforming character which need to be formed in junior schoolchildren have been defined; the stages of modeling action formation have been characterized.*

***Key words:** junior schoolchildren, educational activity, modeling, modeling action, learning modeling actions and transforming character.*

At the present stage of education development one of the most important tasks is the upbringing of independent personality, able to effectively study and work throughout life. Junior schoolchildren have almost inexhaustible cognitive abilities and a willingness to learn something new. A typical educational program, which is based on a competency-based approach, does not require pupils to memorize definitions of terms and concepts, but involves the active construction of knowledge and the formation of skills and ideas through practical experience [5].

Therefore, over the years of teaching pupils at school, the teacher must help them not only to master a certain amount of knowledge, but also to learn to acquire them independently, to form their educational activities. In primary school, learning activities become the object of special formation for the first time. The components of

educational activities are: goal setting, work planning, performance, results verification, summarizing, work evaluation.

Scientist V. Davydov, the author of the educational activity theory, singles out as a special educational action – the modeling action [3].

Modeling action is “a research of any objects, systems, phenomena, processes by building and studying their models” [2, p. 246].

For successful learning in primary school, pupils need to form such learning modeling actions and transforming character:

- coding / substitution (use of signs and symbols as conditional substitutes for real objects). It involves the use of various symbolic means (numbers, letters, diagrams, etc.), which are usually not a special object of assimilation in terms of their characteristics as sign systems. The use of different symbolic means to express the same content is a way of separating content from a form;

- decoding / reading information;

- ability to use visual models (diagrams, drawings, plans) that reflect the spatial objects arrangement or the relationship between objects or their parts to solve problems;

- ability to build schemes, models, etc. [1].

The formation of the modeling action takes place in three stages:

I stage – substitution – is fundamental, because the child needs to master the mechanism of substituting the original for the model with the help of symbolic means. In the end, pupils will receive a substitute image of a real object or phenomenon;

II stage – coding – translation of textual, verbal information into sign language. The result of children’s actions at this stage will be the creation of an image-model of the original through symbolic actions.

For successful mastering of coding action, it is expedient to use various operations in pedagogical activity:

- 1) model transformation (model completion; removal of model’s unnecessary elements);

- 2) model decoding;

- 3) model modification;
- 4) model complication.

III stage – decoding – model approximation to the original. At this stage, the following techniques are used: model application in practice; consideration of the model use to describe various objects and phenomena in real life (the original); correlation of the results obtained in the modeling process with reality; comparison of the original and the model as its substitute – the representative [4].

The use of modeling actions in the learning process allows to develop the ability of younger students to generalize, transferring the process of their thinking to a higher level. Teaching the child how to build a model of natural laws, the teacher forms in his mind the appropriate abstractions, and leads to generalization. Therefore, the need to master modeling in the form of learning action is dictated by its importance as a means of cognition.

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