

PSYCHOLOGICAL AND PEDAGOGICAL ASPECTS OF STUDENTS' LEARNING OF
DRAWING

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Abstract: The article deals with the problems of formation of spatial thinking and spatial imagination in pupils of VIII-X classes. Psychological and pedagogical aspects of studying drawing by pupils are substantiated. Types and classifications of thinking are given.

Keywords: spatial thinking, spatial imagination, thinking, spatial image, imagination.

An important type of thinking that has a direct impact on quality graphic training is the operation of spatial images. The deeper and more logical the thought, the more clearly and concisely it will be reflected in the drawing or expressed in words. By expressing their thoughts aloud, pupils learn to emphasise the main points, which is of great importance in solving this or that task, in understanding it more deeply.

Studies of domestic and foreign teachers and psychologists confirm that spatial representations in pupils of VIII-X classes (adolescence) are not sufficiently developed. This is manifested in the numerous, not easily overcome difficulties that many schoolchildren experience in creating and operating spatial images. At classes in many subjects for better learning of knowledge along with visual images of certain objects conditional images in the form of graphs, schemes, diagrams, tables are used, which helps to reproduce any subject relations (functional, structural, etc.) without the use of modern computer technologies that directly affect the formation of spatial representation.

Some authors use the term "spatial thinking", which in the psychological and pedagogical literature is interpreted in a broad sense as thinking with spatial images. A spatial image is a secondary image of an object that arises in the human mind on the basis of perception. Spatial thinking is understood as a complex and multifaceted representational process that results in the creation and operation of a spatial image. Creation of a spatial image can be carried out both with the use of means of visual learning and with maximum distraction from it. The main content of spatial thinking is the operation of spatial images.

Important indicators of the development of spatial thinking are the breadth of operation and completeness of the image. The breadth of operation is understood as the degree of freedom to manipulate spatial images using different graphic material. The completeness of the image is its correspondence to the real object. It characterises the set of image elements, their connection and dynamism. The breadth of operation and completeness of the image allow us to monitor the dynamics of spatial thinking development in the process of reading a drawing, etc.

The problem of formation of spatial thinking, spatial imagination in students, the result of the above processes are spatial representations, without which it is simply impossible to master the subject "Drawing". The development of imagination is the most important condition for mastering the ability to build and read a drawing and graphic activity in general. However, the process of learning to draw serves as one of the most important means of developing the imagination.

The spatial image has a number of specific features. Created predominantly on a graphic basis, it is complex in nature. It represents both the singular and the universal, the concrete and the abstract, the empirical and the theoretical. It reflects spatial properties and relations of objects, characterising to a greater extent not the object, but its position in the system of objects. It is the spatial image that is the operational unit that makes it possible to distinguish spatial thinking into a separate type of thinking.

Spatial thinking is a type of visual thinking. When operating with images, they are recreated, reconstructed, modified in the required direction. Images here are both the source material, the basic operational unit, and the result of the thought process. This does not mean that verbal knowledge is not used. But unlike verbal-logical thinking, the word is used as a means of interpreting changes in images that have already been made.

Spatial thinking in its most developed forms forms visual images on a graphic basis. The formation of scientific ideas and concepts of space in schoolchildren is one of the most important tasks of intellectual development and graphic culture. The ability to identify the shape and size of depicted objects is mediated by a system of knowledge, methods and ways of action, mastery of specially developed standards of geometric shapes. There is much less reliance on knowledge when delineating spatial relations.

As already mentioned, spatial thinking is a multi-level formation. Therefore, the indicators of its development should be sought in the specificity of the activity of spatial representation, which ensures the creation and operation of images. Although these are closely related processes, different activities underlie each. When creating an image, the visual base, on the basis of which the image arises, is subjected to mental transformation. When operating with an image, an image already created on this basis is mentally modified, sometimes in conditions of complete abstraction from this basis. In both cases there is a change of primary images, but the conditions of this transformation are different. In the first case, it relies on perception, recognition, identification of objects given graphically, in the second case it is based on the ability to carry out the required spatial transformations mentally, without reliance on perception, i.e. by representation.

By singling out the operation with images as a special kind of activity, which does not coincide neither in its content, nor in the conditions of implementation, nor in the results with the process of image creation, I.S. Yakimanskaya reveals the levels of spatial thinking development.

The separation of two types of activities, such as creating images and operating them, shows that several levels of spatial thinking development should be distinguished. The spatial representation is formed in multidimensional activity, which is conditioned, firstly, by special conditions of image creation (abstraction from the visual basis of different kinds), and secondly, by the content of the representation, as the pre-formations carried out in the mind are a whole system.

Thinking is the most generalised and mediated form of mental reflection that establishes connections and relations between cognizable objects.

Thinking is of different kinds and is classified using different bases. Thus, by form, thinking is differentiated:

- *concrete-action* (based on direct perception of objects in the process of actions with them);
- *visual-imaginative* (characterised by reliance on representations and images);

- *figurative or visual* (the product of which are new images that can be objects of visual manipulation and transformation);

- *verbal-logical* (carried out by means of logical operations with concepts).

Thinking operations used in the study of drawing (technical graphics):

Synthesis is a thought operation that allows one to move from parts to the whole in a single analytical-synthetic thought process.

Comparison is a thinking operation based on establishing similarities and differences between objects.

Analysis is a thought operation of dissecting a complex object into its constituent parts or characteristics (properties).

Generalisation is the association of objects into one group by their common, essential features revealed by comparison: the presence of edges, faces and vertices.

Classification is the distribution of objects, phenomena and concepts into classes, departments, divisions in accordance with their common features.

Imagination representations are new images and are subdivided, depending on the way of their creation, into two groups: images of recreative imagination and images of creative imagination.

An *image of recreative imagination* is a new image that is created on the basis of given material, recycling memory images by mentally processing it. They are created in practice when solving the following tasks: construction of a third image of an object based on two given ones, construction of a drawing of an object based on a verbal description, making a part cut. The images of recreative imagination are also the images created on the basis of reading epurés, working and assembly drawings, kinematic, electrical schemes.

The *image of creative imagination* is a new image. Its creation is not directly directed, not dictated by a given material - a conventional image, or a text - as in the creation of an image of the recreative imagination. In this sense, images of the creative imagination are more "free" than images of the recreative imagination. In this way the designer mentally creates a new technical object that has no analogy, although familiar images are used in some of its features.

Psychologists have proved that the activity of representation is determined and conditioned, on the one hand, by the content, conditions and form of presentation of visual material, the requirements of the task, and on the other hand, by subjective selectivity, depending on personal interests, a person's inclination to work, his emotional attitude to the material.

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THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-4, ISSUE-5

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