PSYCHOLOGICAL AND PEDAGOGICAL PROBLEMS OF SPATIAL THINKING DEVELOPMENT IN DRAWING LESSONS

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ABSTRACT

In the article, the author has widely disclosed the psychological and pedagogical problems of developing spatial thinking in drawing lessons.

Keywords: Spatial thinking, ontogenesis, pedagogical skills, geometric bodies, abstraction techniques, psychology, synthesis, communication, motivation, curiosity, need, independence, intelligence, activity, image, technique, drawing.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

The development of spatial thinking occurs in the process of mastering the knowledge accumulated by the child and is one of the essential characteristics of the ontogenesis of the child's psyche. A high level of spatial thinking development is a necessary condition for the successful assimilation of various General education and special technical disciplines at all stages of training, thereby emphasizing the relevance of this research topic.

The experience of teachers of secondary and higher educational institutions, as well as psychologists and teachers-researchers shows that students often do not cope with tasks of both theoretical and practical nature that require the formation of a specific type of mental activity for their solution, which provides an analysis of spatial properties.

Shortcomings in this area of education affect the performance of students in various school subjects, such as drawing.

We can say that the process of formation of spatial thinking is not fully understood at the present time. The conditions for its full-fledged formation at school age are not fully known.

Spatial thinking is formed at all stages of ontogenesis under the influence of various training influences [2], has a pronounced individual specificity, especially its manifestation in various types of activity (gaming, educational, professional).

The problem of forming spatial thinking and spatial imagination in students is spatial representations, without which it is simply impossible to master this subject. The development of imagination is the most important condition for mastering the ability to build and read a drawing and graphic activity in General. At the same time, the process of learning to draw serves as one of the most important means of developing the imagination [5].

The most important condition that ensures the formation of ideas about technical details is to teach students how to review and remember details, as well as how to reproduce them from memory. During the lessons, students learn techniques for analyzing a part: mentally dividing it into the geometric bodies that make up it, and selecting all its elements (protrusions, recesses, holes, etc.). This, in turn, requires a mental drawing of the boundaries of each geometric body (where the details of these bodies are not delimited).

In addition, the determination of geometrical bodies impose requirements on the techniques of abstraction: students must mentally define each geometric body of its essential features. So. for example, students under the guidance of a teacher consider a rectangular bar with a groove. They state that this bar is a combination of several straight quadrilateral prisms, and show their essential features (the two bases are equal and parallel, the side faces are rectangles); similarly, they consider the shape of the groove and the overall shape of the bar.

The most important principle aimed at learning is the following: at the beginning of learning new material in the course of drawing, students are taught basic techniques that are characterized by additional support for visual material, and then the technique must ensure the restructuring of techniques so that the student creates images without additional support, i.e. mentally, by the activity of the imagination. The transition of students from actions with additional support to mental ones when forming images of the imagination reveals a pattern consisting in the fact that the transition from actual actions, or actions with visual material, to mental actions, i.e. to actions in the mind, plays an important role in the assimilation of knowledge and skills.

This transition must be made in a timely manner. If students take too long to teach "visual" ways of learning that do not involve the activity of the imagination, this can make it difficult to develop their spatial representations [1].

In the future, students are taught techniques for creating images using the activity of imagination. The teacher does not give students cardboard three-sided corners, but offers to reproduce mentally the actions that they actually performed when learning a visual technique: imagine a three-sided angle and a technical detail standing in it, mentally draw perpendiculars from its vertices on the face of a three-sided angle, imagine projections on these faces, mentally rotate the right and lower faces.

In this case, the method of creating an image is expressed as follows: students create images of projections using additional representations (three-sided angle, spokes). The ego is achieved by the activity of the imagination. At the same time, students make the transition from actual actions with visual material (in pre-training) to mental actions based on additional representations. After that, students are taught a more difficult technique for them. The teacher sets them the following task: to learn how to represent the projections of a given detail without relying on additional images, i.e. not representing a three-sided angle. This method of creating an image is as follows: having considered the shape of the part, we consistently mentally "see" its three planar images. In other words, we consistently imagine three projections at the appropriate places on a piece of paper and then draw them. The transition to this method is characterized by the fact that the reliance on additional representations disappears, which is associated with the complication of the activity of the imagination. When mastering this method, many students experience serious difficulties. They can't "see" an object in a "flat view", i.e. they can't "see" it. they can't get away from the third dimension. If students still manage to visualize a particular projection of the subject, this image easily disappears or is

distorted. In order to overcome difficulties, students go back to the previous method: they create an image using additional representations.

techniques that students need to create images when reading a drawing. The teacher explains to students that reading the drawing includes:

- review of the drawing (including all its details and symbols) n correlation of its elements in three projections;

- creating an image of an item based on this drawing. This last process is complex and has two inextricably linked sides.

First, the student mentally combines three projections, i.e. synthesizes them, and, secondly, he mentally fills the projections with the third dimension.

Adolescence is a very complex, fraught with the danger of crisis phenomena, a period in the life of a child. During this period, the child's body undergoes a dramatic transformation that unfolds in the process of puberty. A teenager has a sense of his own adulthood. He has an idea of himself no longer as a child, he seeks to be and be considered an adult. From here, the child has a new life position in relation to himself, to the people around him, to the world. It becomes socially active, receptive to the assimilation of norms, values and behaviors that exist among adults,

Therefore, the period of adolescence is characterized by the fact that here begins the formation of moral and social attitudes of the student's personality, the General direction of this personality is outlined.

The teenager strives for active communication with peers, and through this communication he learns himself. He has needs that he must satisfy only himself (the need for communication with peers, friendship and love). Parents and adults in General cannot solve the problems of teenagers related to their new needs, while the satisfaction of all the basic needs of primary school children depends mainly on parents. All this often has a painful effect on the attitude of students to adults, including the teacher, and to teaching.

The overall picture of students ' work in the classroom is getting worse compared to the lower grades. Informed of the approximate and accurate students allow themselves not to perform the task. Notebooks are kept sloppily. Many students ' handwriting changes, it becomes illegible and careless. When solving mathematical problems, some teenagers do not show the necessary perseverance and diligence [6].

The propensity for active pastime is clearly found in games. The growth of mental strength is manifested in the interest in games and mental exercises. Many people like problems on intelligence, learn chess, etc.

Thus, the growth of mental and physical strength changes the nature of activity of adolescents: and much more than before, they begin to attract classes that require a certain perseverance and independence.

One of the important tools that activate the learning process is to encourage cognitive needs. Cognitive need occupies an important place in the General psychological development of the individual, and especially its motivational-need sphere. Cognitive need is a motivational and personal education, which is manifested almost throughout the school age in the curiosity of students, being reflected in the system of their educational and non-educational interests.

There are two levels of cognitive needs in students aged 13-17.

1) Curiosity (typical for students in grades 7-9).
2) Purposeful cognitive activity (most often observed in students in grades 10-11) [4].
It is much less obvious, although perhaps the student's will plays a much more important role in the success of learning.

It is necessary to begin the education of the will with the acquisition of the habit of solving problems of relatively minor difficulty. Systematically overcoming small difficulties at first, and eventually significant ones, students train and harden their will.

Mental processes and, consequently, learning success are also affected by a number of factors that do not seem to have anything to do with them. These are such aspects of a person's personality as emotions, feelings, mood at the moment, temperament, character, and others.

Only on the condition that if the task is available to the student, if the goals of its solution are clear, if he feels his movement forward, then the positive emotions created in this case facilitate further solution.

The question of the influence of suggestion and self-suggestion is extremely important in teaching problem solving. The teacher should be sensitive in their conversations with students. All sorts of comments like "you can't do it anyway" can be very demoralizing for a student, especially a teenager. Conversely, the confident belief that "the task must be solved because you are serious about it, and you are no worse than others" will play a positive role in many cases.

For some reason came to the conclusion that "he is not capable", that "nothing will work", then, of course, no matter how long he would sit on the task, he still will not solve the problem. This autosuggestion of the adolescent paralyzes his will, deprives him of concentration of thought, and he will not be able to mobilize as much energy to overcome the challenges facing him as he could show in normal conditions. In this case, it is necessary to achieve a change in the psyche of the student-teenager, instill in him confidence in his abilities, excite the will. It is possible that a student who has lost faith in himself, it is advisable to first give the simplest tasks to solve, in order to give him the opportunity to believe in his own strength [3].

The General education subject "Drawing" is constantly undergoing changes, which are determined by the social processes taking place in society. Graphic training of schoolchildren from informational and cultural positions is being improved, updated, and revised. The Informatization of the society created the prerequisites and made it necessary to revise the goals, objectives, and content of the school drawing course, which led to the development of new drawing training programs.

New goals and objectives of the course of drawing caused the need to expand the subject area of drawing by introducing material about the graphic language, which is a set of visual and symbolic systems for displaying information about three-dimensional objects created by man. "Drawing" is understood as an educational discipline that studies the graphic language of universal communication, based on a system of methods and methods for graphic display, transmission and storage of geometric, technical and other information about objects and rules of execution, and reading certain types of graphic images. Due attention is paid to highlighting the historical aspects of the appearance of the graphic language, improving its methods, and developing the systems that make up it.

Thus, familiarization with the graphic culture becomes the goal of drawing training, which is specified in the main tasks:

✓ learning the graphic language of communication, transmitting and storing information about the subject world using various methods and ways of displaying it on the plane and reading rules;

✓ mastering the rules and techniques for performing and reading drawings for various purposes;

✓ development of logical and spatial thinking, static and dynamic spatial representations;

✓ development of creative thinking and formation of elementary skills to transform the shape of objects, change their position and orientation in space.

The formation of graphic culture of schoolchildren is inseparable from the development of figurative (spatial), logical, abstract thinking by means of the subject, which is implemented when solving graphic problems. The course of drawing for students forms analytical and creative (including combinatorial) components of thinking and is the main source of development of static and dynamic spatial representations of students.

Inclusion of students in various types of creative activities related to the use of graphic knowledge and skills in the process of solving problem situations and creative tasks. The process of learning knowledge includes four stages: understanding, memorizing, applying knowledge according to the rule, and solving creative tasks. The stages are related to the activity of recognizing, reproducing, and solving typical and non-typical tasks that require the application of knowledge in new situations. Without the last stage, the learning process remains incomplete. Systematic reference to creative tasks creates prerequisites for the development of students creative potential, which is implemented at the end of training when solving problems with elements of technical design. Creative activity creates conditions for the development of creative thinking, creative personality qualities of students (the ability to long-term stress and intellectual loads, independence and patience, the ability to finish the job, the need to work at full strength, the ability to defend their point of view, etc.). The result of students ' creative work is the growth of their intellectual activity, the acquisition of positive emotional and sensory experience, which as a result ensures the development of the creative potential of the individual.

These conceptual provisions are interrelated, mutually dependent and reveal modern ideas about graphic training of schoolchildren.

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