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DEVELOPING STUDENT SPACE IMAGINATION IN DRAWING CLASSES AND ITS PSYCHOLOGICAL FUNDAMENTALS

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The earliest sources on students' cognitive activity and its nature date back to ancient times. It has been known since ancient times that cognitive activity helps students to get deeper into the essence of things, processes and events, to strengthen memory. In the works of medieval thinkers who lived and worked in the Near and Middle East, serious attention was paid to the fact that the types, principles, structure, criteria of scientific knowledge are related to human mental development and perfection.

Al-Khwarizmi clearly distinguished cognition through emotion from knowing through "logical reasoning": emotion is a "minor" property, while "logic" studies the essence and believes that they interact.

In Beruni's scientific heritage, a great place is given to the scientific method of studying and knowing nature. Characteristic features of Beruni's scientific method are objectivity and rational approach, observation, experiments, study of oral and written monuments, critical approach to evidence, logical generalization in the form of mental conclusions and comparison to determine the truth.

In particular, Beruni describes the body in Kitab at-tafhim as follows: The boundary of an object is a surface, the edges of a surface are lines, the end of a line is a point.

Apparently, while Beruni first described the body, Euclid first described the point and finally the body.

Speaking of measuring space, Beruni identifies six aspects - the directions of measurement. Then plane, straight line, angles, their types, circle and lines in it, sine and cosine, triangle, its types and lines in it, types of rectangles, parallel straight lines, angles formed when they intersect a straight line, experiment, internal and external drawing the shapes are described, as well as the rules for determining the surfaces of straight-line shapes, the length of a circle, and the rules for calculating the surface of a circle.

In the section on stereometry of the work are given the rules for determining the cube, prism, cylinder, cone, sphere, ball pieces, spherical shapes, their surfaces and volumes. This chapter also contains information on the formation of second-order curves consisting of conical sections, i.e., the formation of a circle, ellipse, hyperbola, parabola, and straight line in a section when the cone is intersected by planes of different positions.

Beruni gives five different descriptions of these polygons, stating that it is possible to make five different regular polygons in a sphere:

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- a polyhedral body with six squares
(cube) is called "worth", ie erniki,
- a body consisting of twenty equilateral triangles
(icosahedron) is called "oil", ie water,
- a body consisting of 8 equilateral triangles
(octahedron) is called "airy"
- a body consisting of four equilateral triangles
(tetrahedron) is called "noriy", meaning fire.
- a body consisting of 12 equilateral pentagons with sides
(dodecahedron) is called "celestial", i.e. celestial.

Abu Rayhan Beruni stressed that education should be consistent, demonstrative, goal-oriented and conducted according to a specific system. In his opinion, exhibitionism makes education more comfortable, clear and interesting, develops observation and thinking.

Ibn Sina (X-X1 centuries) describes the various modes of cognitive activity as "different forces of the soul" and interprets many of these forces separately from the influence of the divine primordial judgment. According to ancient (ancient) traditions, he divides the soul into three types: plants, animals, and minds. The first is divided into the mover and the receiver. The receiver, in turn, is divided into external and internal receivers.

Ibn Sina’s scientific legacy spanned all fields of natural and social knowledge. He developed the didactic principle that “education should go from easy to complex”. Principles such as “taking into account the inclinations and abilities of children”, “exercise should be at the level of the child’s ability” and “education should be carried out in conjunction with exercise” play an important role in Ibn Sina’s didactic views.

For example, the geometry section of Ibn Sina's Encyclopaedia explains the order in which tasks are performed, including the use of a compass (pargar) and a ruler. In the chapters devoted to mechanics, the structure of simple machines such as pulleys, blocks, levers, screws, pins is described, and they are clearly shown in drawings and graphics. It is noteworthy that a clear image of the bell, screw, pona, etc. is shown in the projection, which is very close to the axonometric, ie frontal-dimmetric projection.

Block columns, etc., are depicted in perspective in combination with axonometric projection. In this play, Ibn Sina, in addition to a clear description of the mechanisms, also describes their drawing in the scheme. For example, while depicting the screws with the wheel, as well as the connection of the wheel, screws and blocks, at the same time shows them in the drawings. These are prefabricated drawings, reminiscent of modern kinematic schemes.

One of Ibn Sina's important pedagogical principles is that the human mind affects life and destiny, and that man differs from animals in that he has an exact mind, that is, the ability to understand what he is doing. Ibn Sina's views on the leading role of the environment in a child's cognition are important in his pedagogical views.

Even today, the development of cognitive activity is one of the pedagogical problems, the optimal solution of which is aimed at increasing the effectiveness of teaching students. An analysis of the current

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situation shows that in the practice of drawing education, students do not pay enough attention to the content of this important activity.

Until recently, equipping students with ready-made knowledge was a priority in education, but today the need to pay more attention to the process of managing cognitive activities under the "National Training Program" has become a priority.

For the learning process to be productive and efficient, students must have a certain level of cognitive and imaginative activity. Education should be both a goal and a tool to develop students 'cognitive and imaginative activities. Therefore, the school is tasked with educating an active, creatively inquisitive person.

Therefore, the development of cognitive and imaginative activities is necessary not only for the successful completion of educational tasks, but also for the performance of educational tasks, which should develop students' mental abilities, respect and enthusiasm for work.

The problem of developing cognitive and imaginative activities is related to the development and application of specific methods and techniques.

Current curricula from drawing focus on the development of students' knowledge and spatial imagination. Spatial geometric images play an important role in realizing this problem. So what is spatial imagination?

The mental reconstruction of the shape, size, parts of a given object and its position in space is called spatial imagination. Spatial perceptions are restored in the mind of the thought person through the image or imaginary images of the body formed in memory. According to this feature, psychologists divide spatial imagination into two: memory images and imaginary images.

To imagine an object in an approximate way without processing the thought through the concepts present in memory is called a memory image.

Imaginary images are different from memory images. In this case, the images of the body in memory are processed and the body is enriched with new assumptions. In turn, depending on the formation of imaginary images are divided into two: a) imaginary images formed as a result of the processing of thought; b) images of creative imagination.

Imaginative images are new images created as a result of mental processing of given materials (drawing, description, vivid image). In drawing lessons, the idea of imagining the shape of an object on the basis of its drawing, imagining the detail according to the two given projections, and making the third projection is based on imaginary imaginary images created as a result of thought processing.

We will now try to illuminate this group using spatial geometric images that develop the spatial imagination.

1. In drawing a clear picture and sufficient views according to the written description of the detail, students imagine the elements of the detail based on the information given in the text and draw a picture of it, imagining the image of the detail. In the process of completing such a task, the written description is replaced by a vivid image, and then the vivid image is replaced by another new image, i.e., a sketch of the detail.

2. When changing the images by changing the method of projections, a clear image of the detail is given, and then a drawing of the detail is created. In this case, the clear image is replaced by a flat drawing.

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3. Change the imaging method. If the shape and dimensions of a part of the surface of an object cannot be clearly shown in any of the six basic views, then the view of that part of the object is formed in the newly selected additional plane and is called an additional view. If additional or local views are used in addition to the main views to get a complete picture of the item, the image is exchanged relative to the main views.

5. Replace the image using a clipper. When the cut is made, the part of the detail between the observer and the cutting planes is imaginary removed, the rest is depicted in the plane of projections. The resulting image is exchanged for a new image after the clipping is performed.

7. Replace the image by applying a cut. When an imaginary piece is cut with a plane, the flat shape formed in the cutting plane becomes a cut. The resulting image is replaced by a new image.

Replacing explicit and conditional images with a schematic image. In the schematic representation, the components of the product, their location and interconnection are represented by simplified symbols. Every detail of the device is given a symbol. As a result, the vivid image and conditional images of the object are replaced by a schematic image.

10. When changing the position of an object in space, the detail given with a clear image is imaginatively changed in space, and its hatched side is brought parallel to the horizontal plane. Adequate views of the resulting clear image are then drawn. The resulting views will be views after the barred side of the detail is parallel to the horizontal plane. In this case, the previous image is replaced by a new one.

12. When changing the relative position of the parts, the part marked in the clear image of the part is cut out imaginary. After imaginary removal of the marked parts, a clear image of the resulting detail is drawn. Then, on the basis of a clear image of the detail formed, its sufficient views are drawn. This state of image exchange plays an important role in developing students ’spatial imagination.

Each method of replacing the images discussed above is a product of spatial imagery and plays an important role in developing students ’spatial imagination.

Therefore, the perfect teaching of the subject of image exchange in the course of drawing in schools and professional colleges is an effective tool in developing students' spatial imagination, developing their creative activities, and then in-depth study of drawing and graphic geometry in higher education.

In the practice of drawing teaching, students' independent work is formally considered, and opportunities for the formation and development of their independent work are not taken into account. In pedagogical practice, students 'independent work is not adapted to the didactic tasks at different stages of the lesson, but instead focuses on students' reproductive movements - drawing, geometric drawing, instead of developing thinking activities.

The urgency of the problem of developing students' spatial imagination is due, firstly, to the lack of consensus among pedagogical scholars on the definition of this topic, and secondly, the methods of development are also interpreted differently in the scientific and methodological literature.

According to the analysis of the presented scientific research, it can be seen that there are three main directions on the problem:

The first direction is to accelerate education to a certain extent by performing exercises and practices that determine the knowledge of more students.

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The second direction in the concept of developing students 'spatial imagination is related to the formation and development of cognitive activity, which focuses on qualities such as activity, independence, initiative, creative activity and independent knowledge acquisition.

The third direction is to create the necessary conditions for the development of cognitive activity and spatial imagination.

In our view, these directions in the concept of cognitive activity and the development of spatial imagination do not negate each other, but are inextricably linked with each other. However, because all three areas of the problem are so broad and multifaceted, researching it should be a top priority, identifying the main areas that develop students 'cognitive performance.

Thus, the development of spatial imagination in drawing education means, first of all, the active work of thinking in the process of making different levels of image exchanges.

Indeed, the development of thinking plays a leading role in a learner's cognitive activity.

Since the most important factor in developing students 'spatial imagination is figurative and logical thinking, its development can be prioritized.

This work should be combined with important qualities of the student's personality - intelligence, activity, independence, initiative, creative approach to work, curiosity, independent learning, which can meet the tasks of shaping the personality of students.

At the same time, the most important didactic tool for activating the educational process should be considered the alternation of learning activities of students in the educational process.

"For the student," wrote G.I. Shukina, "the educational purpose of children becomes the motives of educational activity." Consequently, the analysis of learning objectives should be conducted in parallel with the analysis of learning objectives or the analysis of learning objectives in parallel with the analysis of learning objectives.

The goals of cognitive activity are objective. It is not invented by people. On the contrary, the purpose of cognitive activity depends on the development of society, the development of science and technology, art and literature, and therefore it is determined by the requirements and needs of the acquisition of social experience. If the goals of educational activities are formed on the basis of the need to acquire knowledge, skills, abilities, the goals of cognitive activities through spatial images are based on broader, more meaningful events. Such phenomena include the student's desire to understand his place in society, the desire to think with classmates and peers, the desire to develop good qualities, habits, desire for one of the subjects in relation to others, interest in it.

The purpose of self-education, activation is to analyze the achievements and shortcomings in their activities, to strive to eliminate shortcomings, to increase the achievements in the activity, to overcome difficulties. The child achieves this goal by analyzing how and in what ways he or she has accomplished this or that task, by reviewing an essay or a written story.

Learning objectives are characterized by the direct study of learning materials. The realization of the goals of social communication, the realization of the goals of moral, self-activation, leads to the conscious realization of the goals of knowledge. Applying the learned knowledge to new situations, striving to perform the problem, example, exercises in new ways, searching for new facts on the topic, etc., leads to the realization of learning goals.

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- social motives;
- communication motives;
- thinking motives;
- moral motives;
- Motives of self-government.

If the learning goals and motives apply in the lesson system, the learning goals and motives are related to society, ethics, communication, self-education, and they are related to extracurricular activities.

But on the basis of theoretical analysis without dividing the process of cognitive activity into its components, its essence cannot be understood.

The process of students 'cognitive activity and spatial imagination is a complex process. To analyze this process, its contents can be broken down into parts. We try to define the question of the structure of cognitive activity and its optimal structure by dividing it into elements, separate operations, types of activities, means, and so on.

Another component of cognitive activity through spatial images is the means of cognition. Cognitive tools are material and materialized things that the learner puts between himself and the subject of knowledge in the process of learning. The problem is that learning tasks, various diagrams and tables are material things, and educational work and methods of mental activity are materialized things. When material resources are brought into education from outside, materialized things (e.g., methods of educational labor) are in the children themselves.

In order to make our next statements meaningful, we will first focus on the description of concepts that are interconnected with each other.

The first of these is activity. It consists mainly of play, study, and labor.

In psychology, activity is understood as a factor in the realization of human life, its attitude to reality.

Any activity consists of a set of actions that are consciously performed, directed in accordance with a specific goal, which in turn consists of separate operations.

When we talk about graphic activity in our study, we first try to analyze the activity itself.

Graphic activity is the activity of a person in creating graphic images. That is why when we say graphic activity, we mean the process of graphically depicting the material world and events around us through symbolic images.

Cognitive activity is a process that occurs as a result of a number of cognitive activities. The movement of knowledge occurs at all stages of cognition after the theoretical assimilation of concrete reality.

Cognitive behavior is a specific part of the cognitive process. Consequently, it is the result of emotional and thinking actions that result in complete cognition.

Cognitive movement is a concept in a broad sense that is different from mental operations. Because it is accompanied by the emotional experiences of knowing. Only some of the mental elements can be an element of cognition.

In most cases, mental activities acquire a reproductive nature and do not lead to new knowledge. Cognitive action, on the other hand, always implies the acquisition of a new cognitive result.

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Thus, we identified the difference between cognitive action and mental action. But in the literature, often, the term mental action is put side by side with action (operation). In this case, mental action may not be fundamentally different from cognitive action. Thus, the act of cognition is a conscious, goal-oriented result-oriented completed act of cognition.

Cognitive activity is a set of logical sequential actions that have interrelated internal connections.

The sequence and interdependence of cognitive movement requires an analysis of the composition of cognitive activity and the identification of this type of activity. However, theoretical analysis of this problem shows that among the representatives of methodological and pedagogical sciences there is no consensus on the essence of the development of students' cognitive activity in the educational process. There are three different perspectives on this problem.

Because the science of drawing is inextricably linked with spatial processes, it leads to the mastery of the subject through spatial geometric images and, in turn, the activation of the student's ability

Spatial geometric images are a holistic representation of geometric elements and objects consisting of them.to imagine space.

Thus, performing cognitive activities on the basis of spatial geometric images can be the basis for the formation of spatial imagination, which develops in students such skills as ingenuity, rationalization and creativity.

Thus, the above-mentioned authors understand the development of cognitive activity by the activity in education, the intensity and independence in the performance of the educational task.

However, pedagogical practice shows that activity cannot be replaced by independence.

For example, a student may work very actively, but if it is done under the constant guidance of a teacher, this work cannot be called independent work.

What is meant by the didactic basis of developing students 'cognitive activity through spatial geometric images? We understand this concept:

1. To substantiate the goals of students' cognitive activity through spatial geometric images.

2. Scientific substantiation of the content of cognitive activity of students through spatial geometric images. (What do you need to know? How to provide students with knowledge that meets the development requirements of science, technology and culture?

Inheritance in the study of the basics of science, how the student overcomes overload in the classroom, how the content is distributed within the scope of knowledge appropriate to the age characteristics of students to match the student's ability to master?).

3. Scientific substantiation of the formation of cognitive motives of students through spatial geometric images.

4. Development of science-based forms of cognitive activity of students through spatial geometric images.

Scientific substantiation of methods of cognition of students by means of spatial geometric images, ie scientific development of systems of methods of development of spatial imagination and methods of teaching students. (How to teach? That is, what should be the methods of teaching so that students today

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are able to acquire the necessary knowledge, teaching and skills, methods of cognitive activity? How to teach it for the harmonious development of the student and the formation of a harmonious personality?

A system of tools for developing students' cognitive activity through spatial geometric images - substantiation of textbooks, didactic materials, visual aids and technical aids (What to teach?).

Scientific substantiation of the organization and management of students' cognitive activity through spatial geometric images (In what forms of lessons and extracurricular activities? The learning process is not only a process of acquiring knowledge, but also the formation and development of the student's personality.

general and educational in the learning process to turn it into a process

how to organize educational work in order to solve problems more effectively

should be done in forms?).

What is meant by “developing students’ spatial imagination by forming spatial geometric images”?

Developing students ’cognitive activity through the formation of spatial geometric images is a more complex and time-consuming process (Table 1.1).

It is formed in collaboration with the teacher and the student. The teacher raises the question of learning, gives examples of its full operational-subject structure, each individual operation and their order, monitors the process of each action and operation, and finally, whether each student has completed the cognitive activity, if so, how considers whether the elements should be reworked.

Technology for the development of spatial imagination through the formation of spatial geometric images in the student.

Table 1.1

1.	Gradual formation and development of the student's ability to perform individual elements of spatial imagination through spatial geometric images
2.	Information on the level of knowledge acquisition control
3.	Organizing independent and individual work of students and management

Therefore, when we say "Development of spatial imagination in the student through the formation of spatial geometric images":

1. The process of gradual transfer of the individual elements of the activity to the student for independent implementation without the intervention of the teacher, ie the process of information-motivation.

2. The process of controlling the level of knowledge acquisition. The development of the cognitive process as a holistic education can be ensured only if it is mastered in a single process of solving the structural components (both content and process cognitive issues).

3. Organization and management of independent and individual work of students.

It is impossible to describe all the concrete means by which schoolchildren develop the process of cognition through the formation of spatial geometric images. However, the process of learning through the formation of spatial geometric images has elements of problem-based learning in school and other tools such as independent work of students, didactic games, excursions. These tools stimulate all aspects of

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cognitive activity. Such an understanding is particularly acceptable from the point of view of drawing education on the following considerations:

- In the cognitive activity of students through spatial geometric images, spatial imagination is important. In this process, the further course of the learning process depends on the activities of the students. Hence, it is impossible not to overestimate the need to develop the mental processes (imagination, perception, attention, attention) that are specific to this stage;

- Increasing emphasis is placed on stimulating student thinking through the implementation of evolving education. However, in essence, many things need to be memorized, and learning and skills in reproductive activities need to be acquired through exercise. Therefore, the role of memory function and reproductive activity cannot be denied;

The development of students 'spatial imagination activities is multifaceted and can take place in a variety of ways and forms, for example, externally and internally (Table 1.2).

Forms of activity of spatial geometric images

Table 1.2

The external side of spatial imagination activity through spatial geometric images	The inner side of spatial imagination through spatial geometric images
Perceptual FT: observing teacher movement, focusing on demonstration	Spatial imagery develops imagination
Oral FT: speaking the topic, reading the drawing	Encourage creativity
Symbolic FT: drawing drawing (graphic activity)	Independent work, control; mutual control, internal self-control

Through the spatial geometric images of the students, the outer side of the spatial imagination activity is realized through real objects. (e.g., measuring objects, disassembling and making new objects from them, making models, etc.). Perceptual FT: observation of the teacher's movement, learning to listen to the objects shown (model, poster, drawing), the teacher; speech FT: (students say something, read a drawing, etc.); symbolic FT: geometric detail, various drawing, writing numbers, etc. The internal activity of students consists of a variety of intellectual activities: the search and development of an action plan, the separation of significant and insignificant features of the subject in this situation; mnemonic activity: mental grouping of objects, division of the node into details, etc.

It is difficult to combine the types of activities shown in the real learning process and the methods of performing them. All this, of course, is part of the didactic basis for the development of students' cognitive activity.

By spatial geometric images, we mean the external side of spatial imagination activity, which stimulates much simpler cognitive processes (perception, attention, etc.) and stimulates the student's overall work ability. The following methods are used for this:

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- Ensuring the exchange of work of different nerve centers by alternating different methods and learning activities;

- the correctness of words and visuals and abstraction in the learning process proportionality; minutes of rest in class; support for positive emotions; the use of games and competitions as a didactic method, the inner side of zero cognitive activity is primarily to stimulate students' thinking and spatial imagination, and in 8th and 9th grades to stimulate their imagination and creativity.

The main methods used for the internal purposes of developing cognitive activity in the student through the formation of spatial geometric images are: independent work of students; elements of self and mutual control; drawing is a problematic approach to education and so on. The system of external and internal formation methods we have developed includes the stages of students' spatial imagination: the stage of live observation, perception and emergence of imagination, the stage of abstract thinking, perception and systematization of educational material, the formation of conclusions and generalizations, the stage of memory covers.

Sometimes, even when well-thought-out systems and methods of cognitive activity are used judiciously, the student does not fully accept the effects planned by the teacher. Therefore, in addition to the opportunities and tools that shape cognitive activity, it is necessary to study the internal mechanism of cognition.

The general preparation of the student will be focused, firstly, on the pursuit of the goal, and secondly, on the realization of the goal. The strength of the internal mechanism of student learning activity depends on the strength of unmet needs. The goal-oriented special activating force depends on the student's self-assessment and assessment of the difficulty of the task. Adoption of goals is guided by the student's self-assessment.

The most important quality of graphic activity in the process of teaching drawing is the formation of spatial imagination and logical thinking in students. Consequently, such qualities are formed in the process of spatial exchanges at different levels.

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