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DIDACTIC FOUNDATIONS FOR DEVELOPING STUDENTS' COGNITIVE ACTIVITY IN DRAWING EDUCATION

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Abstract
The article analyzes didactic approaches aimed at developing students' cognitive activity in drawing education. The study highlights the role of interactive methods, practical modeling, and modern digital technologies in the formation of intellectual processes such as graphic literacy, spatial imagination, and analysis-synthesis skills. Additionally, it substantiates pedagogical factors that promote students' motivation, independent inquiry, and creative thinking.

Keywords: Drawing education, cognitive activity, spatial imagination, graphic literacy, analysis and synthesis, modeling, didactic approach, innovative methods, interactive technologies, independent learning activity, creative thinking, projection, graphic competence.

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Introduction

Nowadays, enhancing the spiritual and moral development of youth, actively engaging them in culture, arts, physical education, and sports, fostering skills for the proper use of information technologies, promoting a culture of reading, and ensuring the employment of women are among the priority directions of state policy. The five key initiatives proposed by President Shavkat Mirziyoyev have laid the foundation for large-scale work in these areas [1]. The creation of modern conditions for youth to receive education and acquire vocational skills, particularly through the integration of advanced pedagogical technologies, development of contemporary educational resources, and comprehensive didactic support of the learning process, constitutes a crucial task of the current education system. Therefore, designing lessons based on modern methods and implementing them in practice requires teachers to possess high professional competence and an innovative approach.

One of the important directions of pedagogical activity in general secondary schools is the organization of visual arts and drawing clubs, which play a significant role in shaping students' moral and ethical upbringing, artistic taste, work discipline, intellectual culture, and sense of responsibility. Such activities foster qualities including imaginative thinking, self-control, goal orientation, and a creative approach in students.

Analyzing the developmental stages of teaching drawing in the past century, it is noted that textbooks published between 1953 and 1968 contained nearly 300 practical and graphic exercises, most of which were of a reproductive nature. This was because the primary focus at

that time was on students mastering drawing techniques. In later years, textbooks included a noticeable increase in tasks aimed at analyzing images, making substitutions, and understanding spatial situations [10], [11], [12]. In particular, the number of exercises related to image substitution sharply increased, eventually accounting for about one-third of all assignments. This qualitative change was largely driven by the research conducted under the leadership of A.D. Botvinnikov and his team of authors.

A textbook analysis reveals that their content was enriched with a variety of exercises and tasks: comparisons, completing missing lines in drawings, interpreting groups of geometric shapes, modeling, and tasks designed to determine spatial situations, among others. However, some manuals paid insufficient attention to fostering students' active independent learning, with reproductive exercises remaining dominant.

Research from the 1970s, particularly K.S.Satimov's work "Didactic Foundations of Teaching Drawing in General Secondary Schools" [2], proposed alternative ways of organizing drawing lessons. Nevertheless, in practice, student engagement remained low in many classes, often limited to copying drawings performed by the teacher on the board. Such an approach restricts the development of students' creative thinking, independent decision-making, and spatial imagination.

Moreover, some studies indicate that the content of practical work outlined in curricula was not fully realized, and certain exercises were substituted for others. For instance, instead of creating models from clay or cardboard, students were sometimes tasked only with drawing their diagrams. This substitution hinders the formation of students' hands-on skills and modeling abilities.

Addressing these challenges requires the use of modern educational technologies. The study of students' cognitive activity has a long-standing tradition. Eastern scholars such as Al-Khwarizmi, Al-Biruni, and Ibn Sina developed scientific methods for learning, observation, experimentation, and logical reasoning [2], [4], [23]. Al-Biruni demonstrated the application of scientific methodology in approaching problems such as measuring space, determining the shape and volume of objects, and forming conic sections. Ibn Sina, on the other hand, explained the learning process in terms of "mental faculties," emphasizing that education should progress from simple to complex tasks and be adapted to students' inclinations and abilities [2]. In contemporary pedagogical research, the development of students' independent activity remains a central issue. Observations by P.D. Zubenko indicate that a student's intellectual activity largely depends on the correct selection of teaching tools and methods [7]. While traditional approaches positioned students as passive performers, modern methods: such as problem-based learning, independent task completion, peer assessment, game-based techniques, and the use of visual aids significantly activate students' cognitive activity.

The external aspect of cognitive development is associated with attention, perception, emotional visualization, and support of creative feelings, whereas the internal aspect is characterized by the activity of thinking, spatial imagination, analysis-synthesis, comparison, and generalization operations. These operations form the foundation of drawing education. Analysis involves mentally breaking an object into parts, while synthesis entails integrating these parts into a coherent whole. Comparison identifies similarities and differences, and

generalization is achieved by distinguishing the most essential features of the learning material. Abstraction and specification represent higher-order thinking skills and play a crucial role in developing graphic thinking.

Thus, fostering cognitive activity in drawing lessons promotes the development of spatial imagination, creative thinking, independent decision-making, and the ability to communicate freely in graphic language. This process is intrinsically linked to students' personal qualities, such as alertness, initiative, independence, creativity, and curiosity [5], [8]. A review of the literature shows that no unified approach exists for the didactic foundations of cognitive activity in upper secondary school students. The issue of developing cognitive activity in drawing education remains insufficiently studied, with existing research addressing only certain aspects. Therefore, creating a specialized methodological system for enhancing cognitive activity in drawing lessons is an urgent task.

A critical condition for developing cognitive activity in drawing education is the mastery of graphic language, the ability to visualize geometric forms and spatial objects, and the skill to represent them through conventional and symbolic signs. Understanding the interrelationship between graphic images, models, geometric constructions, and projections integrates the logical and spatial components of students' thinking. The development of graphic literacy not only increases the effectiveness of drawing education but also supports deeper learning in mathematics, physics, technology, and computer science.

Modern pedagogical approaches recognize interactive methods, problem-based situations, design-oriented techniques, differentiated instruction, the use of ICT tools, practical modeling, and collaborative creative tasks as key instruments for activating students' cognitive activity [3], [6]. In particular, working with graphic software, 3D modeling, and digital drawing modules significantly enhances students' spatial imagination. These tools allow complex objects' shapes, projections, sections, and surface developments to be visualized clearly and demonstratively.

From a didactic perspective, the development of students' cognitive activity proceeds through several stages:

- Direct observation – the student perceives the essential features of an object through direct viewing and observation;
- Formation of mental images – graphic representations are developed based on visual material;
- Abstraction – essential features defining the object's essence are identified;
- Analysis and synthesis – the image is broken into parts and then reintegrated into a whole;
- Generalization and systematization – the student organizes learned knowledge into a coherent system;
- Practical application – the student develops the ability to independently apply knowledge in new situations. Each of these stages is particularly important in teaching graphics. For example, when studying sections and cutaways, natural models of objects are first presented (direct observation), followed by the analysis of their projections (analysis-synthesis), and finally, students independently draw the object (practical application).

The increasing complexity of cognitive activity requires deeper mental processes from the student. Thinking progresses from a visual-practical stage to an abstract-theoretical stage, with

spatial imagination playing a central role. Spatial imagination involves integrating different projections, mentally rotating objects, visualizing internal structures, and combining details complex mental operations essential for creative thinking, constructive reasoning, and design competencies [8], [14], [16]. In addition, game-based technologies, team competitions, and creative assignments play a significant role in developing students' graphic creativity. For instance, activities such as "Find the Object," "Match the Projection," "Reconstruct the Section," "Create the Model," and "3D-2D Analysis" enhance students' thinking speed, graphic analysis skills, and intellectual activity. These approaches make the learning process engaging, dynamic, and effective.

Independent work in drawing education also serves as a powerful didactic tool for fostering cognitive activity. Assignments such as constructing physical models, projecting objects, unfolding surfaces, solving inverse problems, completing design tasks, and conducting graphic dictations strengthen students' analytical thinking. During such activities, students develop self-monitoring, error detection, analysis, and correction skills.

Psychological components, such as needs, motivation, goal-setting, and self-assessment, play a critical role in the internal mechanisms of cognitive activity. Without the development of student interest, the activation of cognitive processes remains low. Therefore, teachers should consider the student's "zone of proximal development" and cultivate intrinsic motivation within it. As noted by the prominent educator M.N.Skatkin, the primary goal of education is to nurture individuals who think creatively, make independent decisions, and continuously improve their knowledge and skills. Drawing education is particularly well-suited to cultivating these qualities.

From this perspective, promoting cognitive activity in drawing lessons is not only a didactic requirement but also a societal necessity. In today's rapidly advancing technological world, graphic literacy is applied across almost all sectors of socio-economic life. Engineering, architecture, design, computer science, construction, and manufacturing all rely heavily on graphic thinking as a core competency. Therefore, fostering graphic culture in general secondary schools directly impacts students' future professional development [12], [13], [17]. Scientific analyses indicate that one of the key challenges in drawing education is that traditional reproductive approaches do not fully develop students' graphic skills. Students often become adept at copying rather than independent thinking, limiting the development of spatial imagination, creative analysis, design decision-making, and problem-solving skills. Consequently, it is essential to prioritize interactive methods, modeling, practical creative assignments, the use of digital technologies, 3D modeling, and problem-based situations in lesson organization.

The development of cognitive activity is directly linked to students' motivation, interest, independent inquiry, and creative engagement. To effectively facilitate this process, teachers must identify the student's zone of proximal development and select content and methods tailored to the individual. Systematic, stepwise, and didactically organized graphic tasks help cultivate higher-order thinking skills, including analysis, synthesis, comparison, generalization, and modeling. In summary, an effective model for developing cognitive activity in drawing education includes interconnected components: goal orientation, content foundation, modern

methodological approaches, organization of practical activities, and assessment of outcomes. The harmonious integration of these elements fosters advanced graphic literacy, spatial thinking, constructive creativity, and independent thinking competencies in students.

Overall, promoting cognitive activity in drawing lessons is a key condition for enhancing the quality of the learning process, comprehensively developing the student's personality, and preparing them as a competent individual with technical and innovative thinking skills. Implementing this process on a scientific basis enhances the effectiveness of education and ensures students' future professional and cultural readiness.

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