

# SCIENTIFIC AND METHODOLOGICAL BASES OF DEVELOPMENT OF CREATIVE ACTIVITY OF STUDENTS IN DRAWING ON THE BASIS OF COMPUTER ANIMATION MODELS

<sup>1</sup>Mamurova Dilfuza Islomovna,<sup>2</sup> Shukurov Avaz Ruziboevich

**ABSTRACT--** *One of the pressing issues is how to teach a drawing lesson based on information technology. Despite the wide range of scientific and methodological researches, the theoretical and methodological bases of teaching engineering graphics disciplines on the basis of information technologies are not studied. There are many types of computer graphics programs. When choosing a graphic program in drawing lessons, it is important to consider its capabilities. However, graphic software becomes more complex. One of the main tasks of developing graphic programs in drawing science is to develop methodological guidelines for conveying the essence and meaning of the topic to students. This article discusses the benefits of developing computer animation models in the introduction of new information technologies in school drawing. Successful solution of these tasks will require development of theoretical foundations for teaching engineering graphics courses in higher education on the basis of information technologies.*

**Keywords**—creativity, students, computer animation models.

## I. INTRODUCTION

It is not an exaggeration to say that radical reforming of the education system will be the most important factor and strong basis for changing the thinking and outlook of our youth, increasing their political activity and confidence in their future. Our new generation, young people freed from any defects of the past, today is the decisive force of democratization and liberalization of the country, its renewal and its reliable development.

Uzbekistan's national training program, designed to meet modern requirements, promotes the social role of education and training, rather than formal and numerical changes in teaching. Requires changes.

It is well-known that the full implementation of labor and polytechnic education in general education and vocational education will enhance the students' knowledge of graphics and therefore, in the context of scientific and technical progress, it is essential requirements for the ability to work with graphical models of varying degrees of abstraction based on the real properties of the objects are increasing day by day. That is why there is a growing interest in the visual and thinking process of psychologists in the system of "man and technique", and the methods and methods of using graphic tools in the education of teachers and methodologists.

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<sup>1</sup> teacher, Bukhara State University, dilf76@mail.ru

<sup>2</sup> teacher, Bukhara State University, avaz\_shukurov@mail.ru

In recent years, the methodology of drawing has been improving. In addition, it is important to follow the theoretical guidelines and methodological guidelines that have been tested in the field of education for many years. The most important of these is the parallel study of axonometric projection with the right angular projection, the correct understanding of the integrity of geometric, projection and technical drawing.

There is still a need to improve the work done so far in the field of student thinking development. This means that children should not only be equipped with a system of knowledge, but also formulate ways for them to think about how to solve various graphic problems.

In methodology and pedagogical psychology, great attention is paid to choosing the best teaching methods. One of the main objectives of the methodology, in particular, is to include issues that enhance students' cognitive functioning in the learning process.

It is important to graphically summarize the knowledge and skills gained by students during the I-VII study of a variety of learning subjects, and this should be done by the teacher of the drawing, relying on practical experience.

In developing students' creative abilities and preparing them for work, special attention should be paid to the selection of the necessary and sufficient number of images in the drawing of subjects.

Teachers should pay more attention to the basics of drawing, to define the basic concepts of the course, and to shape them in children.

In the teaching of drawing, students, as in the past, must continue to have a deep knowledge of projection. Successful performance of educational tasks depends on the regularity of interdisciplinary communication. It is well known that any novelty, technical invention, first arises in the human mind and imagination and is then reflected in the drawings. Therefore, the design that represents the basis of creation and the invention is one of the tools that bring about modern technology and technology.

Therefore, improving the quality and effectiveness of drawing education in the schools of the Republic and meeting the needs of the younger generation in technical knowledge is one of the most important tasks. .

It is envisaged to carry out optional courses to enhance the knowledge and skills of students. The success of the learning process depends on the activity of the teacher and the student, but often only the teacher becomes active. In this way, getting students' knowledge readily available will not help them to develop sound thinking.

***Learning Outcomes (Studiedness of the research):*** Problem-based learning to teach students how to handle difficult situations. However, these studies are different from scientific research, which is conducted only by students. The problem is that teaching does not prevent teachers from explaining or performing exercises. Occasionally, teachers think that problem-solving is a problem in solving a new topic or doing graphic work. They ask students a difficult question and are only interested in the final result. In this case, the way to get this result is ignored.

Programmed learning (PL) has some advantages. In this case, it is possible to organize active independent work of students. The PL has the following characteristics: the presence of special educational programs, the provision of educational materials with elements of special techniques, etc. The PL was created in America in the early 50's by Prof.F.Skinnert. The computer can be used widely. Formation of a harmonious person in the laws of the Republic of Uzbekistan "On Education" and "On the National Program for Personnel Training", as well as in the normative and

legal documents related to general secondary education and the most important criteria for defining these qualities are the acquisition by students of the necessary knowledge, skills and abilities, as well as the quality of their knowledge.

Indeed, one of the main objectives of the secondary school is to develop the ability to think independently and creatively, to work independently, which are important qualities of a fully developed personality. In this regard, the development of cognitive activity of students, the effective organization of lessons are of particular importance. In particular, the process of drawing out secondary school plays an important role in preparing students for life, careers, and their innovative and inventive activities.

However, this does not mean that all opportunities for further development of the education system are fully used. In particular, a wide range of issues, such as the introduction of advanced pedagogical technologies into the educational process and the improvement of teaching in accordance with the requirements of modern science and technology, are still pending. The problem of developing students' cognitive activity and spatial perception in the process of drawing, as well as the acquisition of skills and abilities to change the image of space objects, is still insufficient.

In particular, there is a great demand for modern lessons. One of these requirements is the effective and rational use of information technology and e-books in the classroom. However, the practical and theoretical basis for the use of information technology and e-books in secondary school education has not yet been fully explored. This again confirms the relevance of the chosen topic.

The basic foundations of the science of drawing Kolotov, M.Ya.Gromov, V.E.Mihaylenko, R.Khhorunov, Y.Kirgizbaev, E.Sobitov, A. Akbarov, Sh.K.Murodov, J. Yodgorov, R.Ismatullaev, D.Kuchkarova, I.Rahmonov; Scientists such as A.D.Botvinnikov, V.N.Gerver, A.Umronhodjaev, J.Yodgorov, E.Ruziev, P.Odilov made a significant contribution to the methodology of teaching drawing. Specifically, scientists replaced the semiconductor with a full conditional image, a natural object to be cut (L.M.Gosudarsky), a cross-image (I.S.Yakimanskaya), a schematic and symbolic image exchange (A.D.Botvinnikov, A.Umronhodzhaev), object swapping (V.N.Gerver), image-based image processing (A.M.Krupennikova), image exchange methods (G.R.Kim), computer-based image sharing (J.Yodgorov), use of AutoCAD graphics package. (T.Rixsiboev) and the development of space imagery (E.N.Vlasov, V.Yuerbakova).

The theoretical foundations and directions of the problem of formation and development of cognitive activity of students are reflected in the research of the following scientists. There are three perspectives on this problem. A number of scientists (N.S.Litvinenko, O.Rozikov, A.Eshmuradov, A.P.Tryapihina, S.Kariev, V.A.Gerver, A.G.Gaitov, F.M.Kosimov) perform creative exercises, tasks and tasks in solving the educational process. to some degree of acceleration. The second group of researchers (M.I.Mahmutov, B.R.Adizov, M.N.Skatkin, G.I.Shukina, Z.T.Nishonova, P.I.Pidkasisti, A.Khatamov, Sh.G.Sharipov, E.Goziev, V.A.Gerver, R.M.Minachayeva) formation of knowledge in their research and, in this regard, the characteristic of personality traits have included the development of such qualities as independence, initiative, creative activity and strong acquisition of knowledge. The third group of authors (T.V.Bologova, V.Y.Herbakova, E.G.Mingazov) devoted the problem of creating the necessary conditions for the development of cognitive activity. According to P.D.Zubenko, who observed the work of students in a special experimental trial, the development of students' mental activity depends on many teaching tools. However, the organization of cognitive activity alone does not

provide a complete solution to the problem. In recent years, it has been proved wrong to divide teaching into active and passive methods. In traditional education, the teacher explains the learning material, sets the problem, finds solutions, and the teacher repeats what the teacher did. In such teaching methods, the teacher is active, and the students are restricted to performing poorly performing tasks. A number of studies have been conducted aimed at improving traditional approaches. A.J.Attokurova, S.Yu.Klimlimuradova, M.I.Enekeev, S.Kariev agreed in their research that cognitive activity of students can be developed through independent work.

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

The relevance of the problem of cognitive development of students is, first, because there is no consensus among teachers about this topic, and secondly, the ways in which the development is interpreted in scientific and methodological literature.

The urgency of the problem is exacerbated by the fact that for many years, the didactic and textbooks published on the subject of drawing do not pay sufficient attention to the ways and methods that stimulate students' cognitive activity and develop their thinking.

This puts high demands on the formation of students' cognitive activity. A.D.Bototniknikov, V.P.Bespalko, M.I.Mahmutov, B.L.Farberman, I.A.Lerner, A.K.Gulyamov, N.K.Kobzeev, I.S. Scientists such as Litvinenko, E.G.Mingazov, N.D.Noskov, Sh.Rayhanov, A.Umronhodjaev, G.I.Shukina, A.Eshmuradov, J.Bruner, N.F.Talizina, and R.Ibragimov.

A.Khaitov's research is devoted to the problems of computerization of the educational process, and the pedagogical-methodological basis of the organization of basic computer science and computing techniques in secondary schools based on PDV (the tool of pedagogical programs). Besides, scientists such as A.Abdukadirov, M.Lutfullaev, N.Muslimov, K.Olimov have been working on the problems of technology of creating electronic textbooks and manuals.

Development of cognitive activity and spatial perception of students in drawing teaching, acquiring skills and skills of them in the teaching of drawing, and exploring the possibility of using the computer in the teaching of drawing, despite the scale of scientific and methodological research. Their problems have not been solved enough.

**Problem analysis:** It should be noted that our country has made significant progress towards the gradual implementation of the National Program for Personnel Training to bring the education system to the international standards. The introduction of modern innovative technologies into the education system, including the introduction of information and communication technologies, is a requirement of the time.

Due to the wide introduction of information technology into the learning process, there is a growing interest in the theory of educational optimization, and the issue of targeted orientation for high quality education has also become a pressing problem.

The rapid development of science and the introduction of modern information and communication technologies in all areas, including the educational process, require further improvement of computerization and the introduction of information technology.

In particular, the effective use of information technology in the teaching of general education schools, continuous improvement of its content, structure, teaching methods, creation of electronic educational resources is one of the main directions of reforming engineering graphics disciplines.

The use of information technology in drawing science is based on the concept of effective management and technologically effective management of the objective operation of complex space processes in a changing environment.

One of the pressing issues is how to teach a drawing lesson based on information technology. A lot of work is currently being done in this area. However, despite the wide range of scientific and methodological researches, the theoretical and methodological foundations of teaching engineering graphics disciplines on the basis of information technologies are not studied.

There are many computer graphics software solutions available today. However, they differ in their application. Experts from each industry choose the most convenient graphic software for their work. Therefore, when choosing a graphic program, it is important to consider its capabilities. In most cases, you will need to master a number of other programs or disciplines before applying graphics software. However, graphic software becomes more complex.

Software developed by Autodesk (AutoCAD, ArchiCAD, AutoCAD Electrical, 3ds Max, Design Review...) is graphic software. With a number of Autodesk software products available, AutoCAD and 3dsMax are among the most popular applications worldwide. Among the firm's software products, 3dsMax is a very popular three-dimensional design and animation framework.

If you have an AutoCAD graphics program for drawing drawing in engineering graphics, there are plenty of opportunities to create in 3dsMax for animation staffing.

The organization of the structure of the educational process by the program enhances the teaching of didactic lessons, including the use of new techniques, the creation of animated models of spatial processes in drawing, as well as the sense of teaching students. To date, the organization of the educational process based on information and communication programs and the teaching of teaching materials based on computer animation models has not yet developed a new method of teaching the subject of drawing.

Using computer graphics software in drawing is one of the main objectives of developing methodological guidelines for conveying the essence and meaning of the topic to students. The development of animated models in the introduction of new information technologies in school drawing is still an urgent problem. Successful solution of these tasks requires development of theoretical foundations for teaching engineering graphics courses in higher education on the basis of information technology.

Now let's list the advantages of drawing science on computer animation models.

1. First, it saves time. Because a 45-minute lesson on drawing a graphic board is also 15 minutes devoted to a new theme statement, it provides only theoretical information, and attempts to fully convey the subject matter through one or two graphic images.

2. Illustration of the process of vital connection of spatial processes. If the content of the topic contains examples of real life experiences, it will be possible for readers to present it as an illustration rather than simply verbally.

3. The quality of the drawings increases. Drawings in computer graphics programs are of a high quality. This is because the computer will execute all the commands on the standard. 4. The students' attention grows. When is a student focused on a lesson? If the computer does not duplicate the resources displayed in the image window, do not bother them, and of course it will cover the entire time of the lesson.

5. Information will be provided as soon as possible. If a teacher creates a traditional lesson, they are bound to a whiteboard. But unless the graphic concepts are explained, the subject matter becomes a very informative subject for students. If the computer is using animated models, it should be noted that the graphics concepts are in the ready model and can display all kinds of databases within the course content.

6. Student self-reliance is achieved. Human psychology knows that anyone can get information on different conditions. For example, someone can hear and master, someone learns, and it is difficult to master unless someone tries to do it again. However, the ability to reproduce computer-generated animation models is endless, and its models have a realistic visualization of imaginary processes. It allows students who have not mastered during the lesson to obtain and develop their own database. Provides individual or team-based activities for students in classroom or extracurricular activities without a teacher.

7. The database is growing. If there is a literature database within the course structure, it will not be able to convey much information to the reader in a very short time. But as teachers use information and communication technology, the school does not limit itself to literature. The reason is that the teacher only spends his time trying to figure it out, but using ready-made models can give you more time. The teacher will intensify his / her professional activity, creating the need to search and implement unused technical graphic resources. The increasing demand for education and upbringing of students in modern conditions requires that the reform of the school education system intensify the educational process. So the teacher tries to keep up to date with the information and additions.

8. Teacher's aesthetic literacy increases. It is the highest and ever-evolving education and training that every teacher working on his or her own interests can acquire. The teacher who is a master of his / her work is a highly skilled specialist; profound knowledge of science; well-versed in the relevant fields of science; able to analyze the problems of child psychology in general; is a person who has a thorough knowledge of teaching and learning techniques.

In addition to the motivation to learn as a teacher when studying individual-psychological differences in the learning process, it is also possible to take the time to consider the level of mental activity that is relevant to a particular student.

9. Students will be more interested in science. Here are some ways to activate the learning process in drawing and to increase their interest in science

- Rational organization of the lesson;
- Use of different visual aids;
- Supporting extra-curricular activities with complex, programmed, diverse tasks, interesting and historical elements;
- Development of students' interest in learning by means of graphic activity, etc.

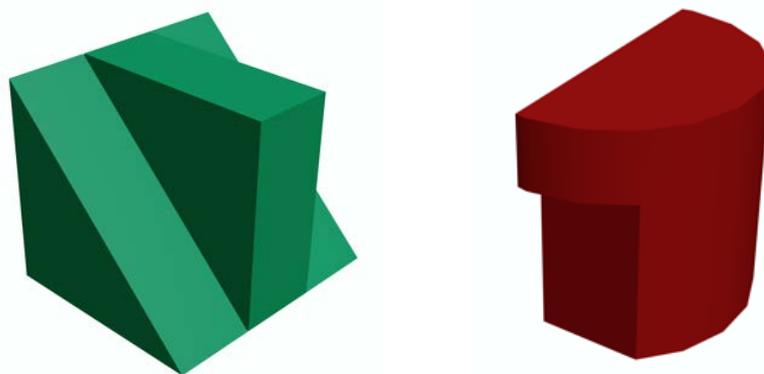
10. Students form interdisciplinary communication. . Graphics facilitate the understanding of complex phenomena and structures, as well as the decision-making process. Modeling and multiplication in science allow

research and study using visual imagery. Graphic images are a link between many types of creative activity. This is why there is a huge potential for drawing in an individual's creative abilities. Polytechnic features of science allow to use various objects, which help to reveal individual interests and abilities of students.

11. The process of spatial imagination to students is reflected in real images. In the course of the training, students will be able to link their findings from observations of life experiences, techniques, life and natural phenomena with the knowledge of the drawing course (for example, the combination of geometric shapes in a particular item, the features of the form, etc.).

12. The teacher not only acts as an informant but also controls the learning process. The teacher does not control the timing, but controls the learning behavior of the student.

For example, a detailed image of the 3dsMax program will be presented to students when they are displayed



**Figure 1:** Information and communication technologies play an important role in this.

The use of information technology to teach school drawing lessons in education will not only help students to develop graphic abilities and spatial imagination, but also to help them develop such ingenuity, inventiveness, rationalization, creative and independent thinking, and, most importantly, the education of a harmonious generation.

## II. CONCLUSION

In summary, much has been done in education since independence. A great deal of positive changes in education have been made by our young people, especially in the creative process and creativity. In recent years, there has been an increase in the Youth Creativity Center and similar institutions for youth.

In drawing lessons, we focus our attention on the youth. Organization of classes using creative questions in the educational process increases the interest of students in science.

In the modern requirements of drawing, it is necessary to develop students' interest in knowledge and to independently supplement their knowledge, skills and abilities. To do this, it is necessary to follow the didactic principles of teaching in the teaching process, and then create the necessary conditions for accomplishing these tasks. Didactic principles are the scientific basis of teaching. Consistent with the development of graphic knowledge, it also provides students with consistent development of their knowledge and ability. The principle of consistency requires the teacher to choose the blueprints to read the drawings and to choose the right pedagogical drawings.

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