

## **METHOD OF DEVELOPMENT OF EMERGENCY DESCRIPTIONS OF STUDENTS IN TRAINING SCIENTIFIC GEOMETRY**

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### **ABSTRACT**

The article provides tools, methods and techniques for developing students' spatial representation in teaching geometry and engineering graphics using multimedia computer technology.

**Keywords:** Graphical Geometry and Engineering Graphics, Space Imagery, Multimedia Electronic Textbook, Multimedia Electronic Book, Intelligent Computer Games, Virtual Detail Models, Video Models, Tasks, Level Tests.

### **INTRODUCTION, LITERATURE REVIEW AND DISCUSSION**

We need to further strengthen our efforts to create equal opportunities for higher education. Therefore, it is important for us to reach 20% higher education and college graduates enrollment in 2019 and to increase them in the coming years. The emphasis on higher education today is on the level of public policy and the changes in the system of higher education in the context of modern requirements.

Opportunities for higher education were significantly expanded through the opening of new courses and increasing the admission quota. As is well known, drawing in geometry and engineering graphics in the General Engineering block is a science that requires logical, creative thinking and spatial imagination. Therefore, teaching of this subject requires the use of visual aids, details models, handouts and more. The fact that many of the present-day materials and parts models have become physically obsolete is causing a number of problems in graphic education. In addition, the organization of training in universities using modern computer technologies is one of the modern requirements. Engineers and technologists, trained for all sectors of the economy, need to be well-versed in all aspects of the moral, ethical and professional training. Organization of classes using modern computer technologies and multimedia electronic textbooks is one of the most pressing problems of today. The main purpose of the use of computer technology in the learning process is to ensure that students and users are able to acquire, consolidate, replicate and test the knowledge gained during the lessons.

Higher technical schools cannot be imagined without the knowledge of geometry and engineering graphics. This is because an engineer, a technology or an engineer-educator cannot become a scientist in their field without having to learn this subject. Therefore, in teaching this subject, first of all, it is necessary to develop students' spatial perceptions on the basis of the students' requirements. The use of multimedia electronic textbooks in modern computer technology to develop students' spatial imagination and creative thinking skills in the field of computer geometry and engineering graphics today is an urgent task today.

Spatial perception of first-year students visiting higher education institutions in the subject of drawing. Because in high schools and colleges (social humanitarian, medical and economic

communities), drawing is not taught. As it turns out, the potential, the conception, and the imagination of students entering the university are very different.

Imagination is the process of remembering things and events, situations, images of reality, as well as creative imagination. Enriching your mind with new images plays an important role in your thinking tasks. Imagination is important in acquiring knowledge and acquiring professional skills.

The imagination is the creation of something new in the form of imagination or idea, the activity of the mind, that is, the activity of the brain in creating images of previously unrecognizable images.

What is important to a human being is that by using this imagination, a person can foresee a future subject. For example, an engineer imagines a machine he wants to create from his scheme. The architect imagines a sketch of the building he wants to build.

According to Sh. Because not just what the graphic represents as an object, but the image of a graphic artist. Spatial Imagination is a complete understanding of the shape, size, appearance, condition, and behavior of the object, drawing, object, detail, etc. It is understood that drawing, detailing, and drawing of others can visualize a person's imagination and put it on paper.

Lack of time is one of the major problems (drawing, re-drawing and explaining the desk), as students are often underdeveloped in the teaching of geometry and engineering graphics in higher education. The solution of these problems requires the use of multimedia computer technologies in the educational process. In particular, there was a need for students to use computer technology, multimedia electronic textbooks to develop spatial imagination, to develop the skills of creative and independent work.

In particular, the content of graphic education in the Republic is presented by R.Kharunov, Y.Kirgizbaev, I.Rahmanov, R.Ismatillaev, Sh. Abdurahmanov, K. Zoirov, A. Hamrakulov, J. Yodgorov, and others have been researching improvements, but the problems of improving the quality and effectiveness of multimedia computer technology in teaching science have not been adequately studied.

Neda Bokan, Marco Ljucović, Srdjan Vukmirovich, Charles A. Rankowski, Minaruth Galey, Ramon Rubio García, Javier Suarez Quiro's, Ramón Gallego Santos, Santiago Martín González, Samuel Moran, Fernanz V. Dovgan, MA Surkhayev, IV Robert, ES Polat, IG Eijik, TN Suvorova, MI Belyaev, OK Tikhomirov, VV Kondratova and many others.

PIstomina, OVRazumova, LVZanfirova, LPRusnova, AVPiliper, Yu.Alkova, EPBensenson, N.S. Podkhodova, AI Khubiev, LN Anisimov, HA Arustamovym, AD Botvinnikov, EF Bykovoy, GA Vladimirska, NA Dobrovolsk, AV Ivanov, IYKaplunovich, Yu.F.Katkhanov, EI Korzinov, II Kotov, MN Makarov, AA Pavlov, VSStoletnev, VIYakunin, Yu. A. Volkova, PA Ostrozhkov, I.P. Kaloshin and others conducted research.

Development of self-study by students of LNAnisimov's research through deep study of concepts and images, which will be studied in the 1st course on 2 main directions in teaching students of graphic arts in graphic geometry; 2 noted that it is possible to develop creative activity through study and generalization through creative activities.

I.P. Kaloshin, N.A. In his research, Dobrovolsk emphasized the need to create a classification of creative tasks from drawing geometry.

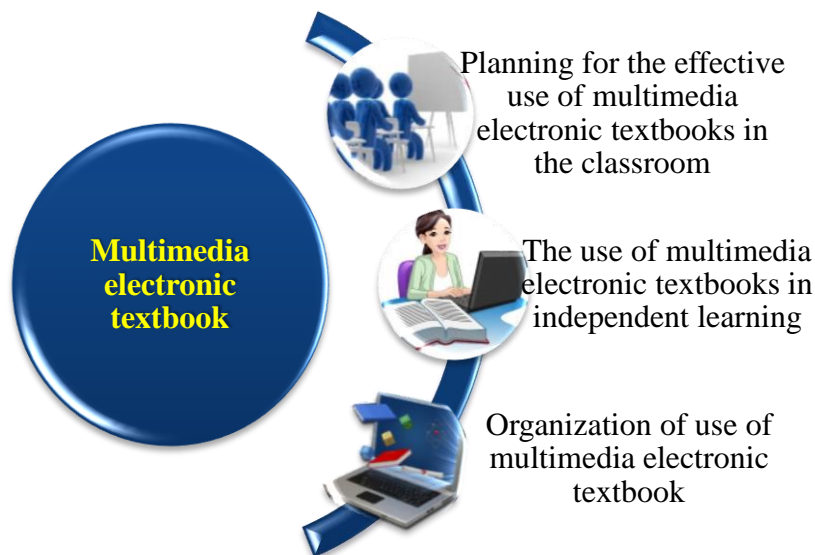
Today, there is a problem with the transfer of knowledge in science to students who have not developed spatial imagination in teaching geometry and engineering graphics. This problem can be solved effectively by using modern multimedia computer technologies. To master the science of drawing geometry and engineering graphics, students must have developed a spatial vision to understand and consolidate their knowledge. Based on the above considerations, it is possible to improve the quality of learning and mastering the students' space vision in a short period of time by developing multimedia computer technologies.

In teaching the subject of drawing geometry and engineering graphics, the practical work on the development of students' spatial representation on the basis of multimedia computer technologies was carried out. For this purpose, a multimedia electronic textbook (multimedia e-book, a set of stratified tasks), intellectual computer games, video games, multi-level test, glossary models, and glossary were created for graphic geometry and engineering graphics.

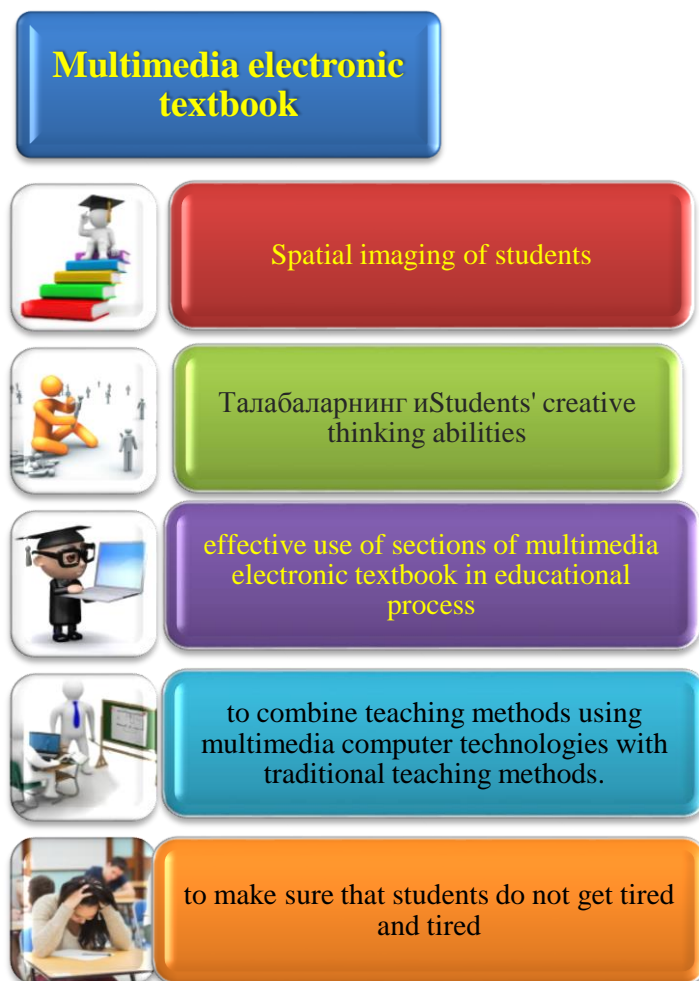
To solve the problem of developing students' spatial representation in teaching graphic geometry and engineering graphics using multimedia electronic textbooks, the following were identified (Figure 1).

When using multimedia electronic textbooks to develop students' spatial representation in teaching geometry and engineering graphics, the following should be considered:

The use of multimedia e-textbooks in the classroom is directly related to the type of lesson (Lecture and Practice), so that a teacher can use modern teaching technologies in conjunction with traditional methods (Figure 2).



Depending on the type of lessons, the teacher of science will determine the use of modern pedagogical technologies and the use of multimedia electronic textbooks. Using multimedia e-textbooks does not require a teacher to have extra knowledge.



Therefore, the teacher was able to properly allocate class time. On this basis, it is advisable to use the multimedia electronic textbook to understand the information provided to students on the subject and to visualize the drawings, details, and tasks. In this case, the information provided, animation, video clips, etc., is important for the students' visualization of the space they are receiving. The student acquires the knowledge he receives only when he can visualize the drawings, appearance, condition, shape and size. The lecture effectively facilitates the quality of the lessons and students' learning as a result of the scheduling of lessons.

According to A. Khamrakulov, "The presentation of spatial solutions before solving problems will encourage students to think independently and to think creatively about the problem and will be able to present it to the students until they retreat. Also, if students have interactive models of

this kind, students will complete their tasks in interactive models. As you enter the task parameters into the interactive model, the task solution will appear on the screen." In the AutoCAD program, students can also create a student's space vision through standard details. These details can be created in different ways using the right dimensions to create them. This opportunity can be compared to a virtual experience booth. In addition, it is possible to perform the necessary corrections on its parameters and details.

The following is a brief algorithm for the use of multimedia electronic textbooks in lectures:

- Use of multimedia e-book for repetition, question-and-answer, and announcement of new topic (10 minutes);
- A brief overview of the topic (description, rules, concepts) of the teacher's topic using animated, spatial and ephemeral illustrations using a multimedia e-book, plus a video presentation (25 minutes);
- Virtual Shows virtual virtual models of thematic drawings. (5 minutes);
- Another thematic drawing is displayed on the blackboard (25 minutes);

Intelligent computer game (10 minutes).

Ask questions and answers (5 minutes) for reinforcement.

The following is a short algorithm of how to use multimedia e-textbooks in practice:

- The teacher gives a brief overview of the topic and is given an animated drawing (20 minutes) of a task using a multimedia e-book;
- Virtual Specify and edit the virtual details of the topic task. (5 minutes);
- Topic drawings are displayed on a blackboard (10 minutes);

- 35 Complete practical tasks on paper using multimedia e-book (35 minutes).
- Using video tutorials develops students' spatial imagination and creative thinking skills (5 minutes)

Amaliy Practical assignments (5 minutes) for independent learning (homework).

As a result of the use of multimedia e-textbooks in independent learning, students will receive short and accurate information on the necessary information based on lectures and practical content. Can view and learn about thematic drawings in animated and video formats. In addition, the drawings will be able to control the drawing sequence automatically and automatically. Practical tasks can be viewed through options and examples of their implementation. The student may revisit the task sequence for reinforcement and assimilation of the sequence and the unexplained part. It acts as a tutor to students.

Multimedia e-textbooks can also be used for lectures, workshops, and independent learning. Multimedia electronic textbook provides full visualization of the subject. In teaching the subject of drawing geometry and engineering graphics, it is necessary to provide visualization for the development of students' space vision. That is, students' spatial vision is developed on the basis of visual materials. It also provides the basis for enriching, testing, shaping and developing knowledge.

1-жадвал

№	Parts of the Lesson	Time 80 minute	Teaching activities	Student activities
1.	The organizational part	10	Using a multimedia e-book to reinforce the theme and repeating it will announce a new topic.	The teacher will answer the question either by the teacher, or by the student who is ready
2.	The teacher briefly describes the main areas (definitions, rules, concepts) of the topic	25	With the help of multimedia e-books, the drawings will be animated and illustrated and will also be displayed in video.	Students will make notebooks and draw diagrams of the provided information
3.	Show thematic drawings	5	Virtual detail models are displayed	Students observe, analyze, and enhance their spatial appeal
4.	Draw another theme drawing	25	Displayed on the blackboard.	Draws the diagram of a sample work assignment
5.	Strengthening of subject knowledge through computer technologies	10	Uses an intelligent computer game.	Looks up the game or book for game-related information in the notebook or book and tells the teacher the key word
6.	The final part	5	Questions and answers will be asked to strengthen.	It strengthens the acquired knowledge and takes an active part

In order to determine the accuracy of the conducted research, the experimental tests on teaching the subject of drawing geometry and engineering graphics using multimedia computer technologies were conducted regularly. Two groups were selected for the study at NamSUI: control group 1 (12-13-TMJ-18), experimental group 2 (27-28-AYA-18) in the fall semester of the 2018-2019 academic year. The experiment was conducted in a cross section of weeks. The following topics were covered in Weeks section:

Topics in Week 1-2 include: dot, straight line, plane;

Topics in Week 3-4: Epyry Reconstruction Methods, Curves;

Topic topics 6 to 6 are: surfaces intersect with the plane;

Topics for Week 7-8-9: Cross-sectional and Axonometric Projections.

Over the course of the week, students were developing a spatial understanding of the subject of drawing geometry and engineering graphics (Table 2). The development of spatial imagination, of course, also influenced sleepiness (Figure 3).

2-table

Observations	Groups	Number of students	5 assessment	4-assessment	3 assessment	Not satisfied
Week 1-2	Control group	25	3	4	12	6
	Experimental group	25	6	11	8	0
Week 3-4	Control group	25	3	4	12	6
	Experimental group	25	7	11	7	0
Week 5-6	Control group	25	3	4	13	5
	Experimental group	25	7	12	6	0
Week 7-8-9	Control group	25	4	5	13	3
	Experimental group	25	8	13	4	0

## CONCLUSION

In conclusion, the development of spatial imagination of students as a result of learning modern graphic geometry and engineering graphics using multimedia computer technology has been proven in practice. When a student develops a space vision, he will be able to master the science of geometry and engineering graphics. Therefore, teaching geometry and engineering graphics requires developing a student's space vision. As mentioned above, the use of modern computer technology as the most desirable tool is a requirement today.

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