



## IMPROVEMENT OF GRAPHIC EDUCATION SYSTEM THROUGH MODERN GRAPHIC PROGRAMS

*Jahangir Avlokulovich Kasimov*

*Is An Independent Researcher National Research University "Tashkent Institute Of Irrigation And Agricultural Mechanization Engineers*

**Abstract:** *In the article, the role of graphic programs in the engineering sciences in the educational system, especially in technical higher education institutions, through them, we can see that the issues related to Build Art technologies, which are the demand of today, can be easily and conveniently solved. The ability to analyze the spatial properties and tasks of subjects is an important component of the graphic preparation of students. In the field of graphic education, development of students' spatial imagination, imaginative analysis of spatial images, activation of mental and cognitive activities of students, development of spatial thinking and imagination, imaginative observation and acceptance of spatial phenomena, shapes, and acquisition of all graphic knowledge and skills, keeping in memory creative qualities such as staying have been adding a significant share to the creation of content.*

**Key words:** *Graphics programs, education, analysis and results, water transfer and water storage facilities, 3D model, engineering computer graphics.*

### **Enter.**

The ability to analyze the spatial properties and functions of subjects is an important component of the graphic preparation of students. In the field of graphic education, a number of psychological scientists on topics such as the development of children's spatial imagination, imaginative analysis of spatial images, division into parts, assimilation of surfaces and shapes into their minds: B.F.Lomov, B.G.Ananev, M.D. Aleksandrova, Y.N. Kobanova-Meller, K.I.Veresoskaya, V.A.Klimenko, N.N.Anisimov, etc. work experiences to activate students' intellectual and cognitive activities, develop spatial thinking, imagination, imaginative observation and perception of spatial phenomena, forms, and acquisition of all graphic knowledge and skills, has been adding a significant share to the composition of creative qualities such as memory retention.

**The current state** of the problem under consideration. After our republic gained independence, the Law "On Education" [3], "National Personnel Training Program" [1] was adopted and put into practice in order to update and fundamentally reform the content of education. began to do. In response to this, exemplary work is being done in the field of graphic education, along with other subjects. In particular,



drawing programs and textbooks of general education schools are being re-analysed and a new generation of them is being created.

However, despite this, there are still a number of problems in the field of graphic education, for the purpose of their elimination, scientific research and research are still insufficient. For example, one of the most important of these is the problem of increasing the level of theoretical knowledge in teaching students graphic literacy, and during the next quarter of a century, no research work was conducted on this topic. If we analyze the research conducted thirty years ago, L.M. Gosudarskiy paid special attention to increasing the level of students' theoretical knowledge in graphic education. He conducted scientific research on this topic. He stated that "in order for students to fully master graphic knowledge, first of all, they need to thoroughly master projection drawing, which is the theoretical basis of drawing [8]. In the field of production, the system of rectangular projections drawings are used more. That is why it is extremely necessary to teach students to read and make such drawings in depth. The rules of constructing axonometric projections and their methods of execution should be considered as methods that help to read complex drawings. "Students will systematically use the knowledge gained from projection drawing throughout the course of drawing." In fact, L.M. Gosudarsky correctly indicated the section of projection drawing as the basis of graphic literacy. Because this section forms the theoretical basis of the drawing course. However, based on the demand of that time, he was able to recommend the use of some elements of drawing theometry. It certainly cannot meet today's requirements and goals. Because today, graphic education requires teachers to develop students' spatial thinking, inventiveness, and creative activity through projection drawing topics [11]. During the former Soviet system, it is difficult to show a researcher who did more positive work than Professor A.D. Botvinnikov in the development of the field of graphic education in general education schools.

In his scientific research, A.D. Botvinnikov gave a wide place to the content of teaching based on projection, and he also came to the conclusion that projection drawing is the basis of developing graphic literacy in students. He deeply analyzes the subjects of projection drawing and negatively assesses that the theoretical and practical knowledge contained in them are separated from each other. It proves the need for theoretical and practical knowledge to complement each other in the in-depth teaching of graphic literacy to students [15]. In this regard, he S.M. Kolotov, K.A. Yankovsky, A.I. Ostrovsky, P.Y. Galperin, B.F. Lomov, Ye. It relies on the work experiences and opinions of a number of Methodist scientists such as N. Kabonova-Meller. At the same time, developed foreign countries give examples from the work experience of America, Germany, and Romania, and show that the subjects of projection drawing in the textbooks created by them are composed of the integration of theoretical and practical knowledge. Stating that projection drawing is important in improving the effectiveness of graphic education in general education schools, he emphasizes that by studying the topics of this section, it is possible to form a number of positive qualities of students, such as activating mental activity and developing spatial thinking [4 ].

In fact, one can hear from many expert teachers that the section of projection drawing is the core of the drawing course. That is why the content of Olympiad assignments in drawing is mostly taken from the section of projection drawing.

It is known that in-depth study of some complex sections and topics included in the program in all subjects is carried out at the expense of optional training. Before analyzing the work carried out in the optional classes from drawing, let's dwell on the opinions and work experiences about the role of optional classes in the educational process. Scientists who have conducted scientific research in this field express the following points.



**Statement of issue.** Therefore, without experimenting with the help of computer modeling, first creating and testing the most suitable model for certain systems significantly reduces the costs of the experiment. Saving costs for experiments with the help of models, in turn, leads to great economic efficiency [1].

What is 3D modeling? 3D modeling is the creation of a 3D project based on a sketch or drawing. To create a 3D model of objects, special programs are used on devices [9], for example, tablets, computers. Rendering is one of the important stages in the modeling process. Modern 3-dimensional engineering computer graphics allows the creation of a 3D model that is difficult to distinguish from a real person or object to make a model of an object or a person look as realistic as possible. A professionally modeled product can be easily presented to clients, investors or partners. 3D modeling software produces three-dimensional digital effects [9]. You've seen the results of 3D modeling in movies, animations, and video games, filled with creatures and structures in this world.

3D modeling is the process of creating a 3D representation of any surface or object by manipulating polygons, edges, and vertices in a simulated 3D space. 3D modeling can be achieved manually with specialized 3D rendering software, which allows the artist to create and deform polygonal surfaces or scan a real object into a set of data that can be used to digitally represent objects. allows.

3D modeling software. 3D modeling software allows you to create basic 3D models of characters or objects. Fully customizable programs give you the tools you need to fill your designers with precise details [9]. There are many 3D modeling software on the market. Here are some of the top rated ones:

AutoCAD has been doing 3D since before it was popular. This professional trading software has been around since 1982 and is considered the gold standard by many designers. Available on Windows and Mac operating systems.

ZBrush from Pixologic brings the technique of clay manipulation into a professional-level application. The process takes a lot of time to master, so it is not recommended for beginners in 3D design. The same developers make Sculpttris, a similar but simpler free 3D modeling program that 3D designers can try first.

3DS Max from Autodesk is a video game developer and visual. Popular with effects artists. While the program can handle animation and engineering, those features require extensive training to master. 3DS Max works with Windows.

SketchUp is a 3D program for designers with experience in 3D modeling. SketchUp specializes in architectural structures and is often used to visualize architecture, interior design, urban planning, engineering, and construction. Available on Windows and MacOS operating systems.

Blender animated movies, visuals. is an open source 3D modeling software suitable for creating effects, art, interactive applications and video games. Works on Windows, Mac and Linux operating systems. Here are some examples of where 3D modeling is used:

3D modeling is used in many fields, including engineering, architecture, entertainment, film, special effects, game development, and commercial advertising. A popular example of 3D technology is its use in mainstream movies. Just think of James Cameron's 2009 film Avatar. The film helped transform 3D modeling into the 3D industry when it used many of its 3D modeling concepts to create the movie planet Pandora.

**Results and analyses.** There are many different ways to represent a topographic surface, such as the earth's surface, and each has its own merits and demerits. Before moving on to the next chapter, we will give a little information about these methods.



Relief is the most complex element depicted on general geographic maps. If simple shapes are depicted by reducing the width and height based on the scale, it is necessary to depict a third indicator - height for the relief.

Relief in the following ways: 1) perspective (showing the shape), 2) cross-hatching, 3) method of horizontals, 4) painting the interval of horizontals (hypsometric method), 5) conventional signs, 6) shooting, as well as 7) with numbers and 8) is described using a model.

In the perspective method, the relief is depicted in the form of a picture, and it is easy to read the hills, hilly heights, mountains, but it is difficult to determine the value. Currently, this method is almost not used. Its improved view is called the physiographic method.



Fizografik

Depicting with dashed lines was proposed by Johann Georg Lehmann, a German soldier. Disadvantage: it is very difficult to show the flat part of the earth's surface.

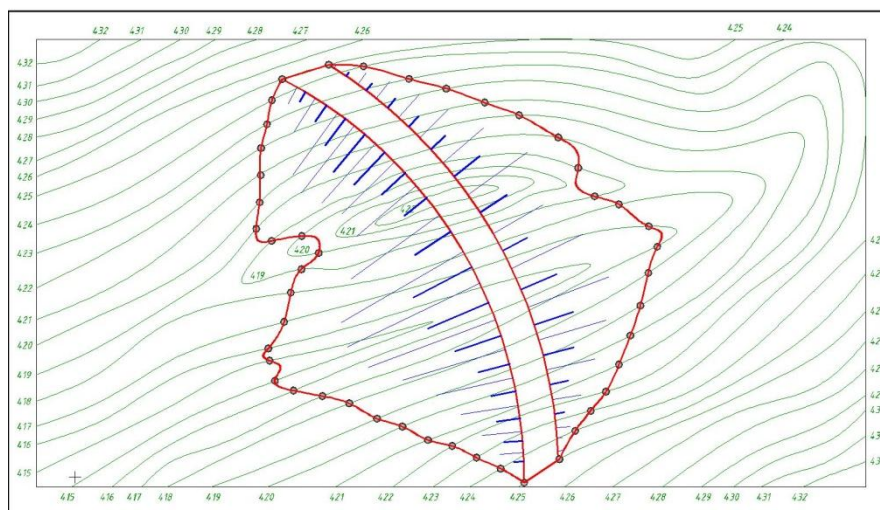


Shtirixlash

The Otmivka method works well for imaging large relief areas. The shaded parts of the terrain are depicted in gray or brown. This method is also referred to as "slanted beam illumination method". The part of the relief up to 200 m high is shown in green color, the higher areas are shown in brown color, and the lower areas are shown in green color.



Otmivka

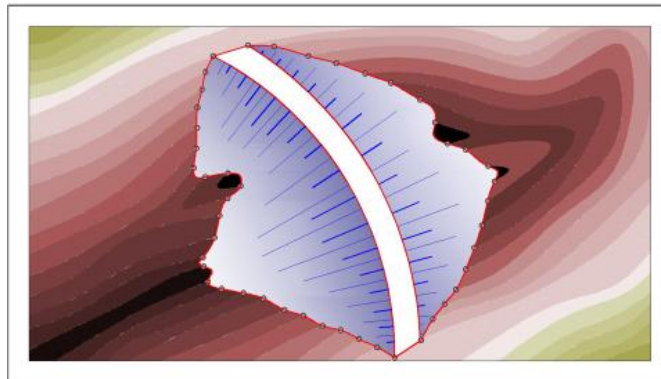


**Figure 1** Although the method of horizontals shows the difference in heights, reading it requires certain knowledge.

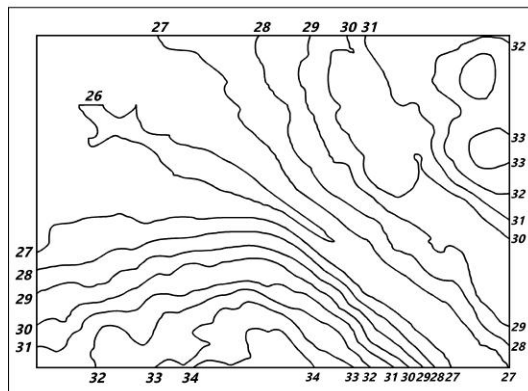




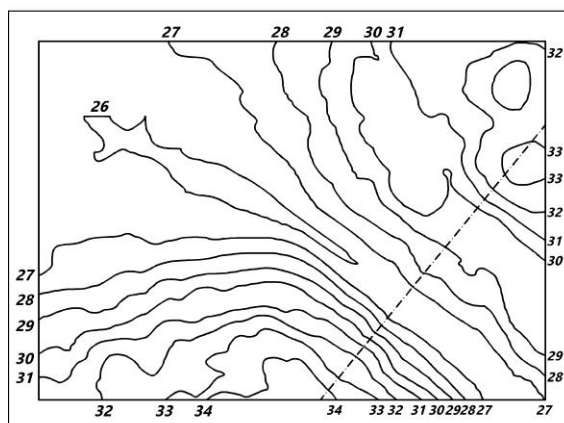
The hypsometric method is used to paint the range of horizontal lines in different colors. Hypsometric relief can be given in 10-16 steps. This method is also used to describe the underwater relief, this method is called bathymetric method.



**Figure 2** In fact, 3d modeling is important in today's society. Below we will consider the stages of building a 3D model of a dam. The given horizontal lines are drawn

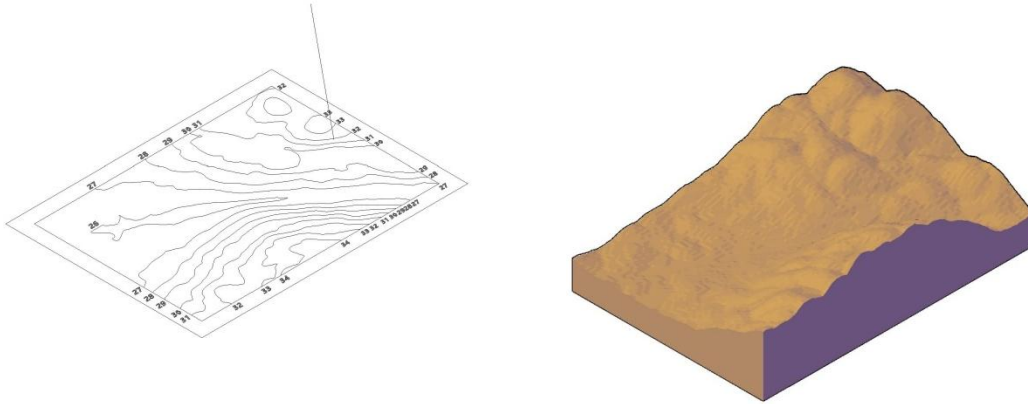


**Figure 3** The axis of the dam is selected according to the option

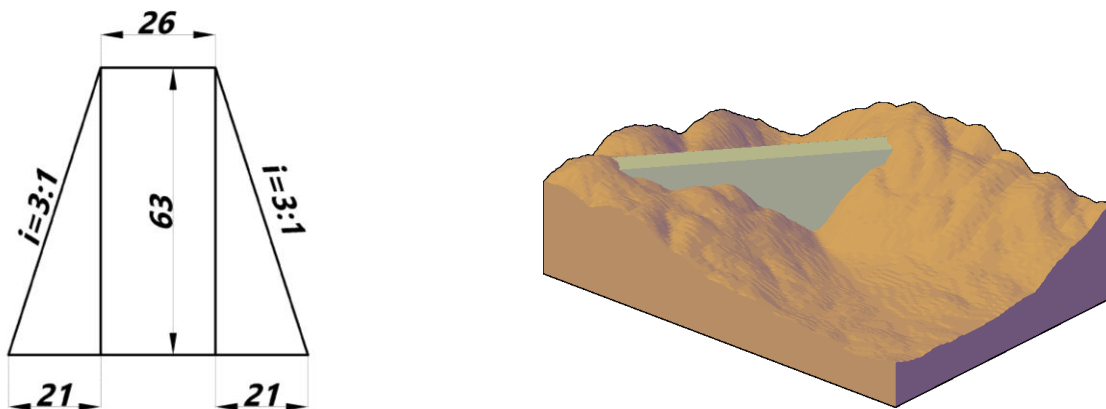


**Figure 4** Horizontals rise to your height





**Fig. 5 The surface of the earth is raised based on horizontals, we can get complete information about the surface of the earth through the 3D model**



**Figure 6 A dam is built based on the profile of the dam**

### Summary

Students' knowledge of modeling is formed in the process of mastering the reality of the environment, drawings. In higher education, students should acquire and understand the most important three-dimensional aspects and features of the real world - two-dimensional and three-dimensional, the basic criteria of drawing and graphic software, acquire a number of skills and abilities, and follow them in practice. , there are the most favorable conditions for them to acquire the necessary knowledge to express their feelings accordingly.

Increasing the teacher's responsibility in the education of students by using the means of teaching engineering computer graphics, providing them with pedagogical and psychological knowledge is one of the current socio-pedagogical problems.

They are able to use the three-dimensional modeling tool in the teaching of engineering computer graphics. Methodological developments, set of tasks, multimedia electronic guide developed on the basis



of scientific analysis of research results and tested in practice are used in all higher education institutions of our republic, in the conditions of increasing demand for teaching graphic programs, they will not only help students, but also Engineering in computer graphics and will have the knowledge, skills and abilities to use three-dimensional modeling.

№	Адабиётлар	References
1.	Pedagogik texnologiyalar va pedagogik mahorat. Omonov, Xattobov va boshq. Pdf.	Pedagogical technologies and pedagogical skills. Omonov, Khattobov et al. Pdf. (in Uzbek)
2.	J.A. Qosimov Muhandislik kompyuter grafikasi., Navro'z nashriyoti Toshkent-2022. Elektron darslik	J.A. Kosimov Muhandislik kompyuter grafikasi. [Engenereeng kompyuter graphcs] Toshkent-2022. (in Uzbek)
3.	O'zbekiston Respublikasi Prezidentining 2017 yil 27 iyuldagi «Oliy ma'lumotli mutaxassislar tayyorlash sifatini oshirishda iqtisodiyot sohalari va tarmoqlarining ishtirokini yanada kengaytirish chora-tadbirlari to'g'risida»gi PQ-3151-son qarori. O'zbekiston Respublikasi qonun hujjatlari to'plami, 2017 y., 30-son, 729-modda.	Resolution No. PQ-3151 of the President of the Republic of Uzbekistan of July 27, 2017 "On measures to further expand the participation of economic sectors and sectors in improving the quality of training of highly educated specialists." Collection of legal documents of the Republic of Uzbekistan, 2017, No. 30, Article 729.
4.	Nasritdinova U.A. Kompyuter grafikasi fanini o'qitishda uch o'lchamli modellashtirish vositasidan foydalanish metodikasi: ped.fanl. bo'yicha fals.dokt. ... dis. – T.: 2018. – 160 b.	Nasritdinova U.A. Kompyuter grafikasi fanini o'qitishda uch o'lchamli modellashtirish vositasidan foydalanish metodikasi. [Methodology of using a 3D modeling tool in teaching computer graphics.] PhD diss. T.2018 (in Uzbek)
5.	Nasritdinova U.A, Satimxo'jaev M. Kompyuter grafikasi fanini o'qitishga zamonaviy yondashuv// Kompyuter grafikasi fanini o'qitishga zamonaviy yondashuv// "Zamonaviy ta'lim" ilmiy-amaliy, ommabop j. – T.: 2013. - №9. – 38-41-b.	Nasritdinova U.A, Satimkhojaev M. Modern approach to teaching the science of computer graphics // Modern approach to teaching the science of computer graphics // "Modern education" scientific-practical, popular j. - T.: 2013. - #9. - p. 38-41. (in Uzbek)
6.	<a href="https://arm.tdpushf.uz/kitoblar/fayl_2004_2021006.pdf">https://arm.tdpushf.uz/kitoblar/fayl_2004_2021006.pdf</a>	<a href="https://arm.tdpushf.uz/kitoblar/fayl_2004_2021006.pdf">https://arm.tdpushf.uz/kitoblar/fayl_2004_2021006.pdf</a> (in Uzbek)
7.	Xamrakulov A., Xaydarov A. «Chizma geometriya» fanini o'qitishda Power Roint prezentasiya dasturidan foydalanish// Muhandislik-pedagogika ta'limida innovasion texnologiyalar. Xalqaro ilmiy-amaliy konf.mat. – Namangan: 2004. – B. 5-6.	Khamrakulov A., Khaidarov A. Use of Power Roint presentation software in teaching "Drawing geometry" // Innovative technologies in engineering-pedagogical education. International scientific and practical conference. - Namangan: 2004. - B. 5-6. (in Uzbek)
8.	Организация преддипломной практики бакалавров по профилю. <a href="https://elibrary.ru">https://elibrary.ru</a>	Organization of preddiplomnoy practical bachelor's profile. <a href="https://elibrary.ru">https://elibrary.ru</a>
9.	<a href="http://www.cad.dp.ua/poleschuk.htm1">www.cad.dp.ua/poleschuk.htm1</a>	<a href="http://www.cad.dp.ua/poleschuk.htm1">www.cad.dp.ua/poleschuk.htm1</a> (in Russian)
10.	Azizxo'jaeva N.N. Pedagogik texnologiya va	Azizkho'jaeva N.N. Pedagogical technology and



	pedmahorat. T.: Nizomiy nomidagi TDPU, 2003 - 176 b	pedagogy. T.: TDPU named after Nizami, 2003 - 176 p. (in Uzbek)
11.	<a href="http://www.oim.ru/reader.asp?nomer=280">http://www.oim.ru/reader.asp?nomer=280</a>	<a href="http://www.oim.ru/reader.asp?nomer=280">http://www.oim.ru/reader.asp?nomer=280</a> (in Russian)
12.	Андижон давлат университети. <a href="https://hozir.org/andijon-davlat-universiteti-v7.html">https://hozir.org/andijon-davlat-universiteti-v7.html</a>	Andijan State University. <a href="https://hozir.org/andijon-davlat-universiteti-v7.html">https://hozir.org/andijon-davlat-universiteti-v7.html</a> (in Uzbek)
13.	Компьютерда modellashtirish: bu qanchalik muhim va u haqda nimalarni bilamiz? <a href="https://kun.uz/uz/news/2020/04/19/kompyuterda-modellashtirish-bu-qanchalik-muhim-va-u-haqda-nimalarni-bilamiz">https://kun.uz/uz/news/2020/04/19/kompyuterda-modellashtirish-bu-qanchalik-muhim-va-u-haqda-nimalarni-bilamiz</a>	Компьютерда modellashtirish: bu qanchalik muhim va u haqda nimalarni bilamiz? <a href="https://kun.uz/uz/news/2020/04/19/kompyuterda-modellashtirish-bu-qanchalik-muhim-va-u-haqda-nimalarni-bilamiz">https://kun.uz/uz/news/2020/04/19/kompyuterda-modellashtirish-bu-qanchalik-muhim-va-u-haqda-nimalarni-bilamiz</a> (in Uzbek)
14.	Муродов Ш.К, Кучкарова Д.Ф, Жўраев М, Хайитов Б.У. Муҳандислик графикаси. Ўқув қўлланма. Т. Саноат стандартлари, 2006. - Б. 35-36.	Muradov Sh.K, Kuchkarova D.F, Jo'raev M, Khaitov B.U. Engineering graphics. Study guide. T. Industrial standards, 2006. - B. 35-36. (in Uzbek)
15.	Морев И.А. Образовательные информационные технологии «Педагогические измерения». - Владивосток, 2004. - 174 с.	Morev I.A. Educational information technologies "Pedagogicheskie izmereniya". - Vladivostok, 2004. - 174 p. (in Russian)
16.	Муслимов Н.А., Абдуллаева Қ.М., Мирсолиева М. «Педагогик маҳорат» фанидан ўқув-методик мажмуа // Ўқув-услуг.қўлл. – Т.: «Фан технологиялари», 2011. – 322 б.	Muslimov N.A., Abdullaeva Q.M., Mirsolieva M. Educational-methodical complex of the subject "Pedagogical skill" // O'ukv-uslub.ko'll. - T.: "Science technologies", 2011. - 322 p. (in Uzbek)

### Information about author

1. **Qosimov Jahongir** - Head of the Department of Drawing Geometry and Engineering Graphics, NRU "TIAME", Kary-Niyaziy-39, tel.: 974506007, e.mail: [jaxongirqosimov7@gmail.com](mailto:jaxongirqosimov7@gmail.com)

### Сведения об автор

1. **Касимов Жаҳонгир Авлакулович**, Заведующий кафедрой Начертательная геометрия и инженерной графики НИУ "ТИИМСХ", Кары-Ниязий-39, тел.: 974506007, e.mail: [jaxongirqosimov7@gmail.com](mailto:jaxongirqosimov7@gmail.com)

