Volume 2, Issue 01, January 2024 **ISSN (E):** 2938-3803

USING THE GEOGEBRA SOFTWARE IN CREATING FUNCTION GRAPHS

Nigora Alisherovna Umarova
Senior Lecturer of the Department of Economics and Finance Angren University

Abstract:
The article talks about the use of Geogebra software for creating function graphs.

Keywords: geogebra, shadow, horizon line, perspective, numerical scale, construction stages.

Introduction

The development of information and communication technologies has accelerated their introduction into all aspects of society's life. In particular, the role and importance of information and communication technologies in the educational process is increasing. Today, the organization of classes with the help of information technologies helps to make educational activities interesting, students learn the learning material faster and increase their motivation to study.

In particular, three-dimensional modeling on a computer provides an opportunity to understand the educational material being studied, to perceive it, and to conduct experiments on it with the object being studied.

Modeling is a method of reproducing and studying or controlling a certain part of reality (object, event, process, situation), its copy or similarity – based on the representation of the object using a model. A model is usually a physical copy of the original or a conditional image, presented in an abstract (mental or symbolic) form and containing important features of the modeled object. Procedures for creating models are widely used in both scientific, theoretical and practical areas of human activity.

The development of the theoretical foundations of drawing geometry, engineering graphics and other disciplines has expanded the methods of obtaining graphic images. In addition to manual methods, computer methods of creating graphic images containing geometric, technical, technological and other information about the object, drawing up project documents are increasingly being used. The use of new information technologies provides opportunities to create, edit, save, reproduce graphic images using various software tools and transmit them through communication networks [2]. In addition, the models used in the teaching of "Drawing geometry and engineering graphics" should reflect the important features of the studied geometric object and its characteristics, serve to clarify the content of the educational material, and be aimed at increasing the cognitive activity of students. Need

A computer created in an interactive environment is distinguished by the possibility to change the parameters of the models as required. For example, it allows to change the dimensions of a three-dimensional geometric model (height, width, length, angle, radius, etc.), its position relative to the coordinate head, and the brightness of its colors. We have created an interactive model of a drawing on the topic "Shadows in perspective"[3] of the subject "Drawing geometry and engineering graphics" and used it in the educational process, as well as recommendations regarding the use of this interactive model in the educational process:

Web of Humanities: Journal of Social Science and Humanitarian Research

Volume 2, Issue 1 January 2024 **ISSN (E):** 2938-3803

Shadows of buildings and structures are formed as a result of parallel rays falling from the sun in perspective. Of these, six different positions of the sun relative to the viewing point are characteristic. The illumination of the sun in these six different situations is shown in the perspective of a parallelepiped located in the plane of objects with the base given below:

1. The sun is ahead, on the left (Figs. 1, 2). The incident point S∞ of the rays directed to the light source is located on the left side. The S∞ perspective of the source base S is on the horizon line. A numerical scale called "Construction Steps" was used to shade the parallelepiped. The numerical scale consists of 12 steps, each step corresponds to one drawing step of the drawing. If you move it to the right, the drawing will be drawn in an animated sequence. During the lesson, the teacher can show this presentation or the student can learn the stages of independent drawing at home. The shadow of the parallelepiped will be formed after the construction stage has completed the full display.

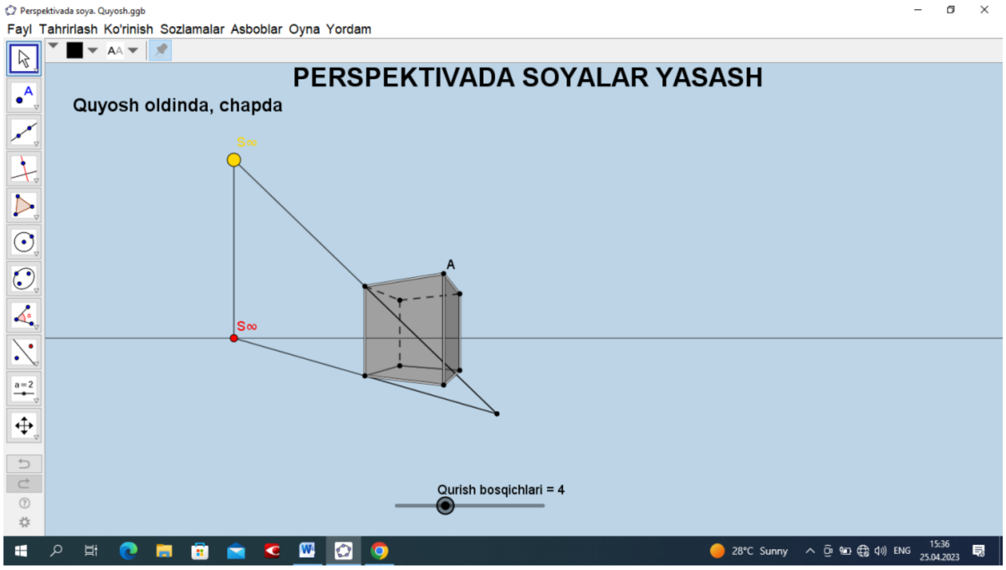

Figure 1. The stage of initial drawing of the shadow of the parallelepiped in the "Sun ahead, left" situation.

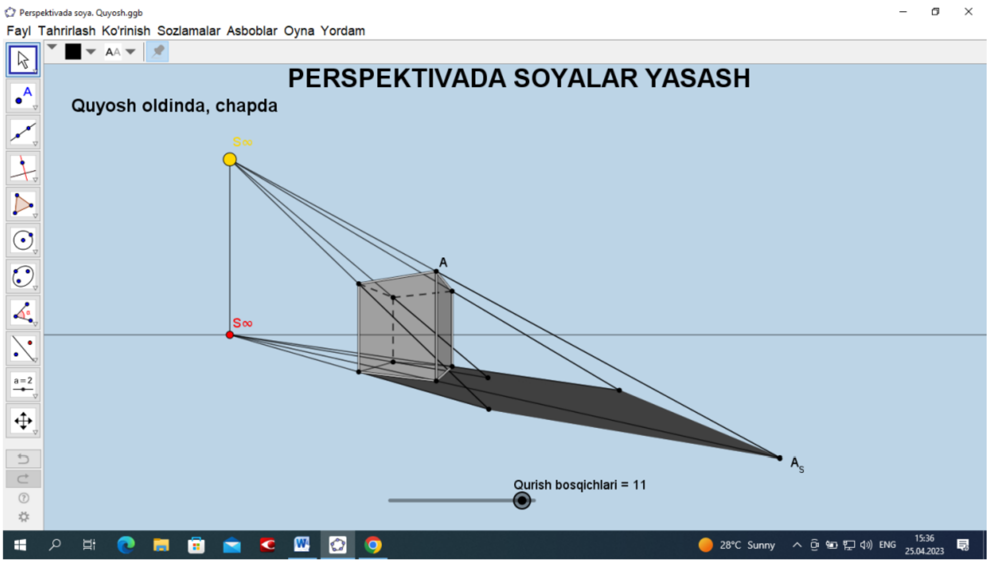

Figure 2. The final stage of drawing the shadow of the parallelepiped in the "Sun ahead, left" situation.

Volume 2, Issue 01, January 2024 **ISSN (E):** 2938-3803

5. The sun is ahead, on the right (Fig. 3). The incident point S∞ of the rays directed to the light source is located on the right side.

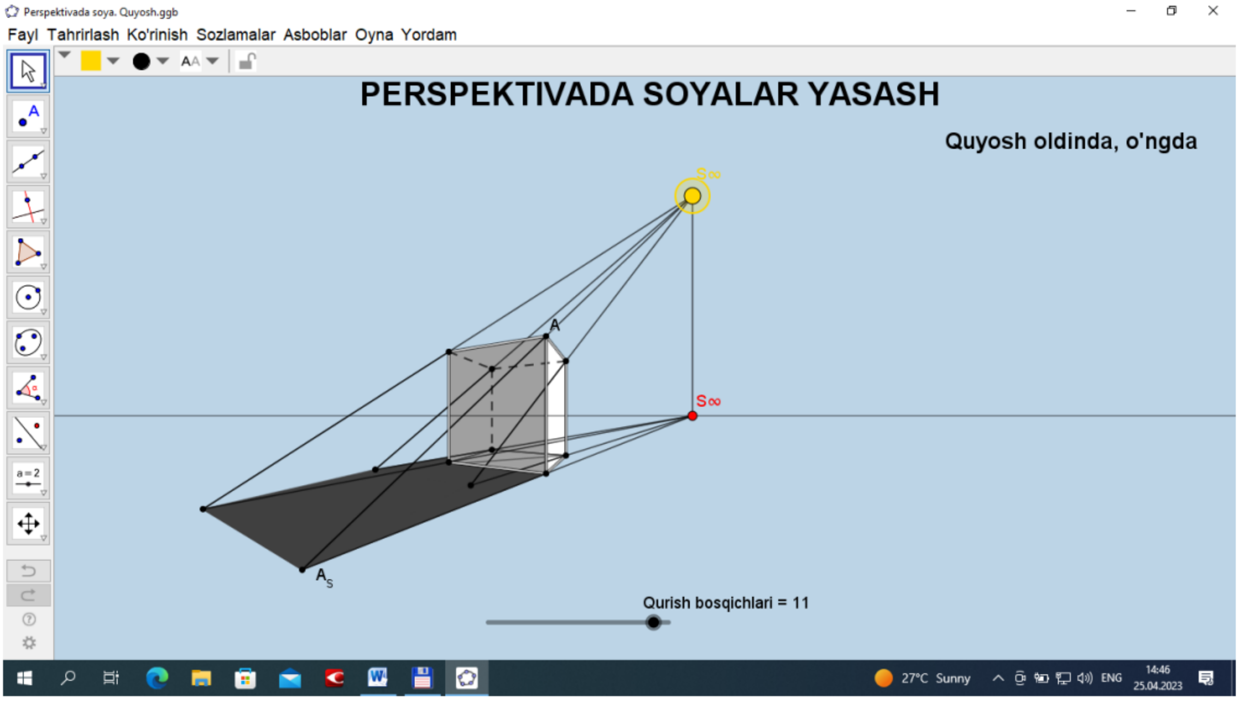

Figure 3. Shadow of a parallelepiped in the “Sun ahead, right” situation.

5. The sun is behind, on the left (Fig. 4). The horizon line S∞ intersects the horizon line, and S∞ is to the right, below the horizon line. The previous method corresponds to the natural mechanics of making shadows. In this method, the shadow and the light source are located on the same side. This unnaturalness is related to the features of the central projection.

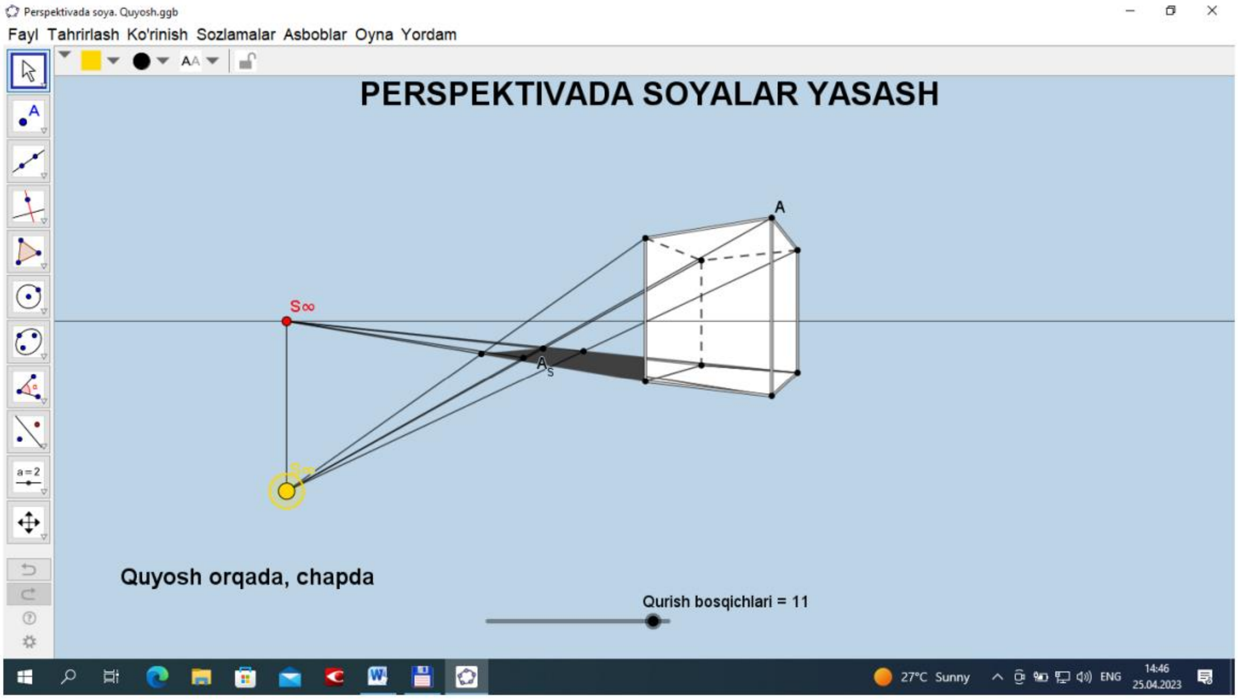

Figure 4. Shadow of a parallelepiped in the “Sun behind, right” position.

Volume 2, Issue 1 January 2024 **ISSN (E):** 2938-3803

5. The sun is behind, on the right (Fig. 5). The incident point S∞ of the parallel ray is located on the left, below the horizon line.

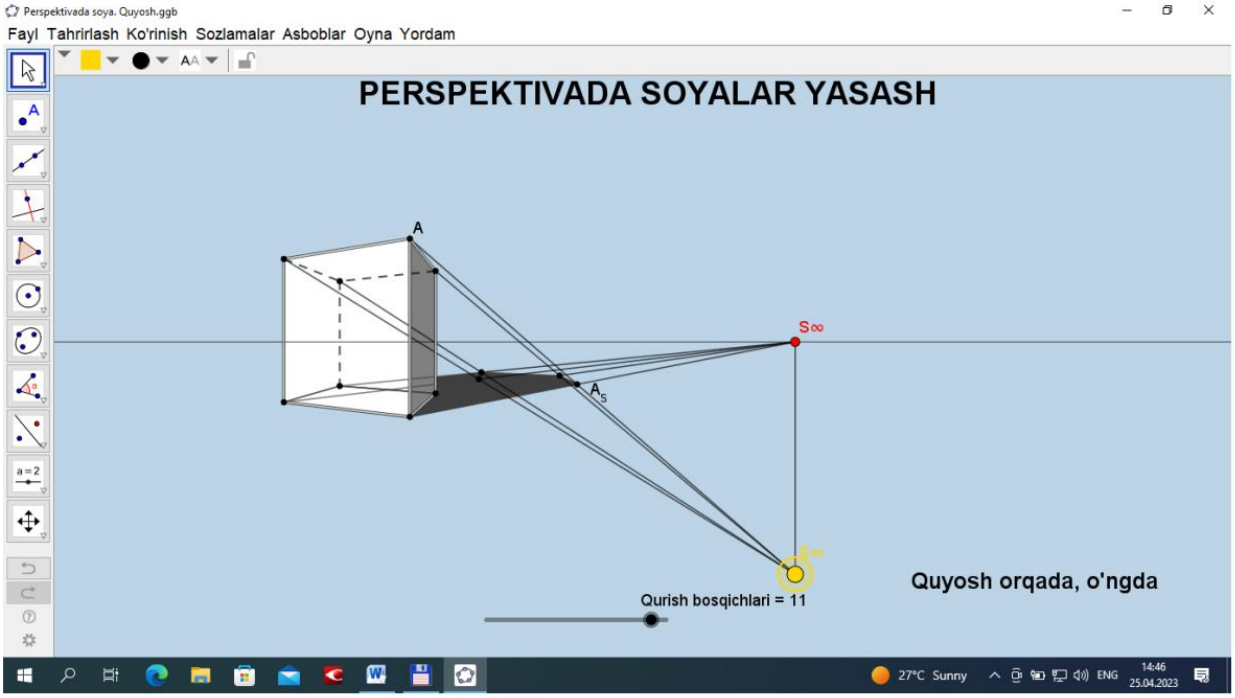

Figure 5. The shadow of the parallelepiped in the “Sun behind, left” position.

The teacher presents the remaining two positions of the sun (the sun is on the right and the sun is on the left) in the same order using an interactive model. The perspective position of the sun given in the drawing (S∞, yellow) can be displayed (drawing) in six different situations using the mouse cursor. Before showing each situation to the students, Sun explains the steps of its construction in an animated sequence. During the lesson, the students demonstrate the stages of drawing that they did not understand again from the beginning.

It can be seen that interactive modeling of drawings provides an opportunity to display a large amount of educational material using a single electronic display tool. Interactive modeling helps to make the learning process more interesting and to develop students’ knowledge, skills and abilities. Such interactive models were prepared to cover all topics of “Drawing geometry and engineering graphics” and were placed on Geogebra.org[4] for use in the educational process. In order to determine the effectiveness of interactive models in the course of the lesson, control and experimental groups were selected. This methodology was used in control and experimental groups of “Drawing geometry and engineering graphics” subjects. The results of the intermediate and final controls of the experimental and test groups were compared and mathematically and statically analyzed. According to the results of the analysis, the use of these interactive models in the educational process of “Drawing geometry and engineering graphics” led to an increase in educational efficiency.

Based on the above, the use of interactive models in the teaching of “Drawing geometry and engineering graphics” has been proven in observations and researches to be the basis for achieving educational efficiency. If interactive models are introduced into the educational process, the quality of education will reach a new level and fully meet today’s requirements.

Volume 2, Issue 01, January 2024 **ISSN (E):** 2938-3803

REFERENCES:

1. Nafasov, D. Sh. (2021). Historical and pedagogical aspects of the use of educational opportunities in tourism. UzMU xabarlari, 2(2), 109-111.
2. Nafasov, D. (2020). Theoretical and pedagogical aspects of forming sociocultural competence of students in tourism. *European Journal of Research and Reflection in Educational Sciences Vol*, *8*(12).
3. Нафасов, Д. Ш. (2023). Педагогические возможности студенческого туризма в системе образования. UzMU xabarlari, 1(5), 122-126.
4. Karimova, Z. A. (2023). Model of preparation of educators of preschool educational organizations for innovative activities. *Web of Teachers: Inderscience Research*, *1*(9), 102-111.
5. Karimova, Z. A. (2024). Организация коррекционно-образовательной воспитательной работы с детьми. Тенденции развития образования и педагогики, 1(1), 185-194.
6. Karimova, Z. A., Ganiyeva, G. T. (2023). Yengil dizartriyali bolalarda monologik nutqni rivojlantirish. Raqamli texnologiyalarni o'quv jarayoniga joriy etish, 1(1), 788-794.
7. Sharafutdinov, I. B. (2024). The Need for Developing Information Tourist and Recreational Resources to Promote Tourist Product of Destinations In Uzbekistan. Pedagogical Cluster- Journal of Pedagogical Developments, 2(1), 163-173.
8. Rakhmonova, G. U. (2018). Use of Gaming Technology in Educational Activities with Preschool Children. Eastern European Scientific Journal, 1(3), 6-12.
9. Туракулова, Д. Б., Мамадаминов, М. Х., & Рахмонова, Г. У. (2022). Межнациональное согласие и веротерпимость–высшие ценности узбекского народа. *Scientific progress*, *3*(5), 198-203.
10. Рахмонова, Г. У., & Туракулова, Д. Б. (2022). Взгляды великих предков о профессии. *Central Asian Research Journal for Interdisciplinary Studies (CARJIS)*, *2*(5), 394-398.
11. Rakhmonova, G. U. (2023). Successive development of the creative person in the continuous education. Spanish Journal of Innovation and Integrity, 1(4), 115-118.
12. Boxodirovna, T. D., Abdushoripovna, R. H., & Ubaydullayevna, R. G. (2022). Analysis of competitive activity martial artists. *Open Access Repository*, *8*(03), 162-164.
13. Rizayeva, G. B. (2022). Yozgi sog'lomlashtirish oylarida tarbiyachining ta'limiy faoliyati. O'quv qo'llanma, *1*(1), 103.
14. Rizayeva, G. B. (2022). Klasterli yondashuv asosida Oliy ta'lim muassasalari va Maktabgacha ta'lim tashkilotlari hamkorligini takomillashtirish. Mug'allim, *6*(5), 116-120.
15. Yaxshimbekova, S. K. (2023). Reproduktiv madaniyat va sog'lom turmush tarzi masalalari jamiyat taraqqiyotining o'ziga xos ko'rinishi sifatida. Finland International Scientific Journal of Education, Social Science & Humanities, 11(11), 192-197.
16. Яхшимбекова, С. К. (2022). Ёшлар тарбиясида ижтимоий педагогик билимларни ривожлантиришнинг аҳамияти. *Ta'lim fidoyilari*, *1*, 21-24.
17. Kamalovna, Y. S. (2021, June). Specific social and psychological characteristics of psychological service. In *Archive of Conferences* (Vol. 25, No. 1, pp. 263-265).
18. Kamalovna, Y. S. (2021, June). Struction of stress in adolescents and methods of prevention and elimination. In *Archive of Conferences* (Vol. 25, No. 1, pp. 274-279).