IJDIAS International Journal of Discoveries and Innovations in Applied Sciences

| e-ISSN: 2792-3983 | www.openaccessjournals.eu | Volume: 1 Issue: 6

Methods of Using Graphic Programs in the Lessons of Descriptive Geometry

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Annotation: This article discusses the methods of using graphic software in drawing geometry classes and the use of computer graphics in drawing geometry classes to form students' spatial imagination, develop spatial and creative thinking and thereby increase their graphic literacy, effective use of computer graphics in coursework and diploma projects. comments are given.

Keywords: graphics programs, computer graphics, line types.

Introduction

The formation of spatial imagination of students through the use of computer graphics in the lessons of descriptive geometry, the development of spatial and creative thinking, thereby increasing their graphic literacy, the organization of effective use of computer graphics in term papers and diploma projects.

In the introductory classes of descriptive geometry and engineering graphics, it is advisable to add general information about computer graphics, formats, basic notations, line types, scale topics, ready standard basic notation in computer graphics, line types, formats topics. The fact that the teacher conducts these topics in two-dimensional computer programs (Microsoft Power Roint, Microsoft Word) increases students' interest in science and computer graphics. It will be necessary to develop optimal plans for the use of computer graphics in the lessons.

Computer graphics can create two types of images: static (in Microsoft Power Roint, Microsoft Word, etc.) and dynamic (AutoCAD, 3D MAX, Corel DRAW). Demonstration of drawing problems in Microsoft Power Roint, Microsoft Word develops students' reproductive thinking and spatial imagination skills. That is, students can solve their own problems based on ready-made problem samples. As a result of the demonstration of spatial solutions of problems in AutoCAD, 3D MAX, Corel DRAW programs, students' spatial thinking and logical thinking skills develop faster and creative thinking is formed.

The use of computer graphics in the teaching of descriptive geometry and engineering graphics is recommended in the following cases:

in showing spatial solutions of problems;

in making surface spreads;

in the construction of spatial curves;

in determining the lines of intersection of surfaces;

in the construction of axonometric projections;

when giving cuts and shears;

ISSN 2792-3983 (online), Published under Volume: 1 Issue: 6 in November-2021

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in the construction of the third projection and technical drawing based on the given two projections of the detail;

sketch of the detail and its technical drawing;

Assembly drawings and their reading, in detail.

The teacher's effective use of computer graphics during the transition to these topics ensures that the lesson is effective. During the lecture, the teacher can use pre-prepared electronic lecture texts, guidelines. During the brief explanation of the topic and after the students are given frontal or individual assignments, some of them will be able to solve spatial solutions in AutoCAD, 3D MAX, Corel DRAW graphics programs, as well as sample problem solving by the teacher on the board.

When finding the true size of planes, their implementation in AutoCAD in three-dimensional system, ie entering the coordinates of points A, B, C of the AVS plane and showing its spatial solution to students expands students' spatial imagination and teaches independent creative thinking. Students basically see the solution of a given problem in a three-dimensional graphic program and perform it according to the rules of descriptive geometry on paper (Appendix 1).

After the construction of surfaces on the subject of making surface spreads, they are divided into planes using the command "hack" of the toolbar "Modification" (Appendix 2). Each plane is placed parallel to a plane of projections. The remaining planes are also placed parallel to the plane of these projections and merged with the previous plane. Thus the elements of all remaining surfaces are placed in the same order. The result is a surface spread.

For example, in determining the line of intersection of surfaces, the condition of the problem is first read out and drawn on the board, or a ready-made electronic methodical instruction is used. An AutoCAD program will be launched to show students its spatial solution. In the "View" section of the "View" menu, select the "4 point view" item and the screen will be divided into four sections (Appendix 3). Each screen is named, that is, divided into frontal, horizontal, plane of profile projections and plane of axonometric projections. Two intersecting surfaces are constructed. The construction of these surfaces occurs simultaneously on all screens. First, a three-dimensional (Realistic) intersection of the surfaces is displayed, followed by a two-dimensional (2D Wireframe) image of them. In a three-dimensional (Realistic) image, students see a spatial image of the intersection of surfaces and form their spatial representations. The ability to display their drawings on drawing papers creates a two-dimensional (2D Wireframe) image. In a two-dimensional image, the line of intersection of the surfaces is not visible (a problem arises in front of the students), as a result of which the students are forced to think in space. In a two-dimensional (2D Wireframe) image, the "merging" command is used to create the intersection of surfaces. The Merge command is selected, and two intersecting surfaces are selected, and the ENTER button is pressed to create the intersection line of the surfaces. In practical classes, students can demonstrate a spatial solution by completing some of the tasks assigned to them in AutoCAD. The fact that some of the assignments are completed by the teacher increases students' interest in working on computer graphics.

In the subject of axonometry, too, students complete the assignment of the problem and then learn to do axonometry manually. It is recommended to use computer graphics as a teaching tool and subject in engineering graphics classes. In AutoCAD, the screen is divided into four parts by the "point view" item in the "View" menu, and the projection plane is named accordingly. For example, one view of a simple model is selected (a view that is easy to grow) and drawn and grown using the extrusion command. Holes are made where needed. In this case, the flat shape will have

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volume in the eyes of the students. The formation of volumetric details as a result of the growth of students flat shapes increases students 'independent spatial thinking skills and interest in working independently.

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