



## DIRECTIONS FOR USING COMPUTER TECHNOLOGIES IN TEACHING THE SCIENCE OF “DRAWING GEOMETRY”

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### ABSTRACT

*This article discusses the main directions of the use of information technology in teaching the subject "Drawing geometry". During the course, the efficiency of using Photoshop and Corel Draw programs was analyzed.*

**KEYWORDS:** *drawing geometry, information technology, Photoshop, Corel Draw, drawings, drawings*

Currently, the development of working conditions in economic sectors is also dramatically changing the qualification requirements for specialists. Therefore, the issue of introducing effective teaching methods in the training of specialists who meet the demands of the times is extremely urgent. The role of information technologies in the training of highly qualified, competitive personnel with modern knowledge is extremely important. The use of information technologies in the teaching process is considered to be one of the most effective methods used throughout the world.

"Drawing geometry" is one of the main subjects in the training of future designers, artists or graphic specialists. Since this subject is directly related to graphics, the use of computer technology in teaching it can lead to good results. The structure and capabilities of a computer are naturally a convenient tool for working with graphics. Especially in modern computer technologies, such opportunities are organized at a high level. This article examines and analyzes the directions of using information technologies in the teaching of the science of "Drawing geometry".

Information technologies can be widely used in the teaching process, in particular, in the teaching of "Diagram geometry", including in the following areas:

- (1) improving the quality of educational materials;
- (2) individualization of the teaching process;
- (3) rapid monitoring and objective evaluation of the acquisition;
- (4) learner-centered learning management;
- (5) creation of opportunities for independent study, introduction of distance education.

We will consider these directions separately.

(1) Computer technologies serve to increase the quality of educational materials, to enhance their visualization and presentation. First of all, various software tools related to computer graphics are used. Among such programs, Adobe Photoshop and Corel Draw programs can be used effectively.

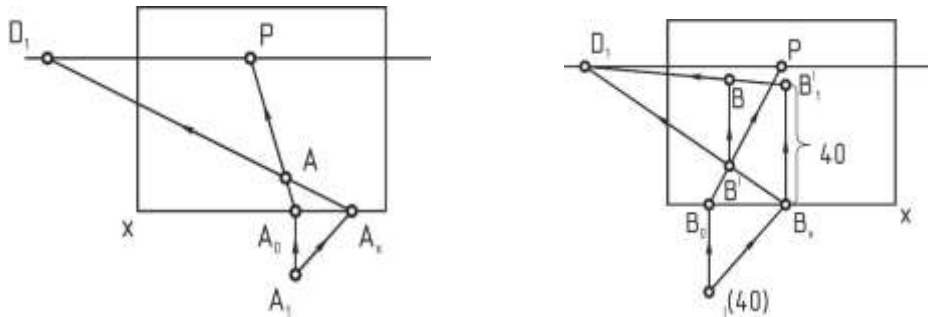
Since the Adobe Photoshop program is designed to process "raster" graphics, it is used for the purpose of graphic processing of educational materials, filling them with the necessary visual elements. Graphical elements are processed on the basis of a raster or grid of points. Also, this program is used in the processing and improvement of previous materials.

With the help of Corel Draw computer graphics program, it is possible to prepare various drawings and pictures related to drawing geometry. In particular, creating a perspective drawing apparatus based on the Corel Draw program when passing the topic "Projection" or "Perspective image making" increases the visibility and comprehensibility of educational materials.

(2) Computer technology can be highly effective in individualizing the learning process. As an example, let's consider the use of computer networks in the educational process. By using a local educational computer network, it is possible to quickly monitor the learning levels of students, along with the transfer of various educational materials to them individually.

For example, when teaching point perspective, each student can be given several different exercises over a computer network.

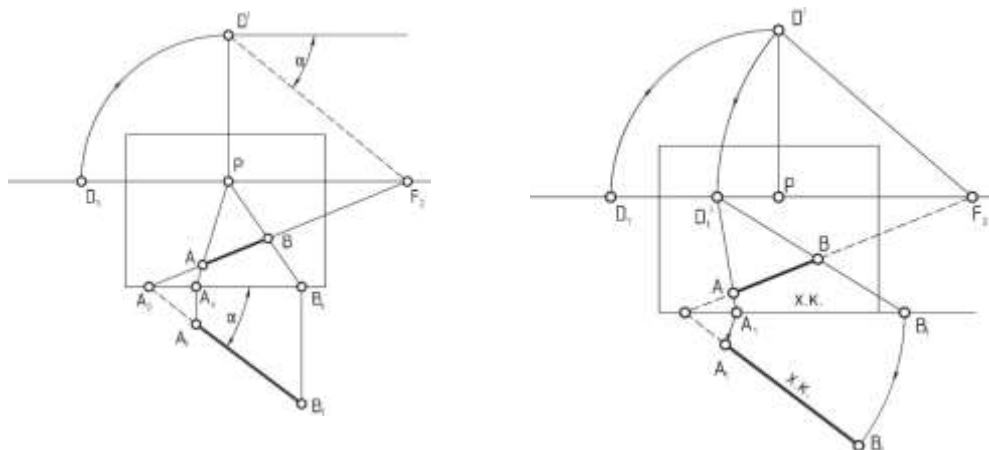
An example. Point A is in the plane, and point V is in space at a height of  $d$  units above the plane. Make a perspective of points A and V (Figure 1).



**Figure 1. Making point perspective.**

In this example, the height  $d$  given to each student will be different. The student will use computer graphics software to complete the example. The teacher monitors the process of the exercise and gives the necessary advice.

Practical exercise (Laboratory exercise). Determine the true length of the straight line section  $AV$  in the general situation given in perspective (Fig. 2). In this exercise, each student will have a different task. For example, the distance from a given cross-section to the image may vary. Also, the angle between the straight line on which the cross-section is located and the picture, or the length of the cross-section in perspective, is different.



**Fig. 2. Finding the true length of the straight line section AV in the general situation given in perspective.**

Assignments are given to students in electronic form using a computer. The student uses computer graphics programs to perform the exercise and presents the result to the teacher in electronic form. The student performs the exercise independently. The teacher gives the necessary advice on how to do the exercise.

(3) In carrying out the above examples, the teacher will have the opportunity not only to observe, but also to quickly monitor and objectively evaluate the mastery. According to the training course, students perform a total of 6 practical exercises, and each exercise is evaluated on a 15-point rating system (one of the 6 exercises is evaluated with 10 points). The evaluation criteria are listed in the table below.

*The table of criteria for evaluating practical exercises on a given topic in perspective science*

No	Identification marks	In the 15-point system for intermediate and current assessment	Against a total of 15 points in %
1	Correct understanding of the task	3	25
2	Correct placement of the drawing in the row	2	20
3	Compliance with line types	5	25
4	Quality performance of the task	5	30
5	Total :	15	100



The use of computer technologies in the organization of current and intermediate rating controls and processing of results helps to automate the rating process and increase its objectivity. In this matter, there are many interactive test computer programs that have been developed today. For example, such a test program is available in the electronic guide to teaching perspective created by the authors [1]. With the help of this program, it is possible to quickly and interactively determine the level of mastery of topics related to perspective. In addition, the student's scores from all controls are stored in the assessment database and combined with the final assessment to form a total score.

(4) Computer technologies make it possible to control the teaching process according to the student. In the e-learning manual for perspective learning mentioned above [1], it can be approached by the student himself or by the teacher depending on the level of mastery of the learner. In this case, the sequence of study of educational materials, the criterion of transition from one subject to the next, the parameters of the adjustment of the control test program are selected individually and the flexibility of the study process is ensured.

(5) Computer technologies in the teaching of the science of "drawing geometry" create opportunities for independent learning, and become the basis for the introduction of distance education. The electronic guide created by the authors [1] can fully provide such opportunities.

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