

TEACHING THE DISCIPLINE “DESCRIPTIVE GEOMETRY” FOR STUDENTS OF THE SPECIALTY “MECHANICAL ENGINEERING” AT THE PRESENT STAGE

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ABSTRACT

The issues of improving the quality of vocational training of engineering students, the use of modern effective forms of education on the example of teaching the discipline “Descriptive geometry” in Tashkent State Technical University are considered. At the present stage, the question of the wide use of the achievements of science and technology, as well as advanced technologies of pedagogy in education, in the upbringing and formation of the personality, is topical. One of the requirements of time is the effective use of information and communication technologies in teaching subjects. The use of information and communication technologies leads to a change in the content of training and teaching. But such changes can give positive results only when learning with the use of advanced educational technologies.

Keywords: Student, descriptive geometry, computer technology, vocational training.

INTRODUCTION

Currently, the rapid development of production and new technologies in the field of environmental engineering determines all the higher requirements for the professional training of students studying in the specialty “Mechanical Engineering”. In connection with the increasing requirements for the quality of students' training, engineering needs to develop new effective forms of education, revise curricula and update existing curricula. Let us consider how the modern requirements for the professional training of students studying in the specialty “Mechanical Engineering” are implemented in Tashkent State Technical University on the example of teaching the discipline “Descriptive geometry and computer graphics”.

Engineering and graphic disciplines constitute the foundation for the training of engineers, contribute to the development of spatial representation, without which design, technological and inventive activity is impossible. Engineering and technical competence of engineering students are one of the most important components of professional competence and imply possession of the necessary amount of special knowledge, skills, subject skills, the ability to effectively use them in solving educational, creative, professional design-engineering tasks and are evaluated by the ability to translate project ideas, sketches into graphic images, drawings and layouts. Engineering training is a means of expanding the functionality of a graduate, which makes it possible to carry out the entire design process from the birth of an idea to the realization of a project in the material.

The discipline “Descriptive geometry and computer graphics” forms the basis of engineering education designer, forms the basic knowledge necessary to study special disciplines, forms the professional qualities of the future designer's specialist. The objectives of the development of the discipline “Descriptive geometry and computer graphics” are:

the formation of students of professional thinking; familiarization with the theoretical foundations of the methods of image objects on the plan;

acquisition of practical skills of imaging used in the design of environmental designers (orthogonal, axonometric, perspective projections).

LITERATURE REVIEW

When training in technical areas the role of graphic subjects at a special level. A highly qualified specialist engineer must be able to depict any mechanism on paper in the form of a drawing, and be able to read any drawings. Anyone who cannot read technical drawings and cannot express his ideas on paper in the form of a drawing cannot be considered highly qualified [1-3].

One of the requirements of time is the effective use of information and communication technologies in teaching subjects. The use of information and communication technologies leads to a change in the content of training and teaching. But such changes can give positive results only when learning with the use of advanced educational technologies.

Learning opportunities using computer technology are very large: - Computer technology reduces the time required for mechanically repetitive learning moments. For example, instead of students recording theoretical lesson presentations, a textbook can be recorded on a CD and this will save some time of the lesson. When performing graphic or term papers, as well as course and diploma projects, teacher advice or counseling is necessary. The questions asked by students are repeated from year to year.

In recent years, university applicants demonstrate a low level of graphic training. This is due to the fact that drawing as a discipline is excluded from the compulsory school curriculum. The consequence of this is an undeveloped spatial, figurative thinking.

Studying the course “Descriptive Geometry and Computer Graphics” is envisaged at the beginning of the training, in the first two semesters, and from the very first classes students are faced with the need to think in images, to represent geometric objects, which causes them great difficulties.

The learning process is also complicated by the fact that in the first year students are faced with the problem of social adaptation to the conditions of the university [1-3]. In this regard, there is a need to introduce new approaches when conducting classroom studies and the organization of independent work of students.

The course of descriptive geometry for students of the specialty “Mechanical Engineering” includes the sections: “Descriptive geometry” and “Computer graphics”.

Today, due to the ever-increasing volume of knowledge offered to students, a decrease in the volume of hours of classroom instructional lectures and laboratory classes, an increase in the density of the flow of educational material, educational information received by a student, optimization of the educational process is necessary. But at the same time it is important to ensure a significant and durable stock of knowledge in the course of descriptive geometry,

which is necessary for the further training of the student in the university and the future professional activity of a mechanical engineering specialist.

METHODOLOGY

The department of the Tashkent State Technical University with the aim of intensifying the educational process, improving the quality of professional training of mechanical engineering students in studying the course of descriptive geometry uses modern computer technologies.

Modern information technologies in studying the course allow you to:

- significantly increase the motivation of students to learn;
- increase interest in obtaining knowledge;
- form the necessary competence in professional activities.

The use of computer technology (computer graphics, animation) in training is the key to effective mastering of the course of descriptive geometry.

When studying the course “Descriptive Geometry and Computer Graphics”, computer technologies are used at lectures and practical classes, in the development of textbooks, knowledge control, testing, in the scientific work of students, and when students perform individual graphic tasks.

Lectures and workshops on descriptive geometry are built using multimedia PowerPoint presentations. Multimedia lectures provide an opportunity to diversify graphic illustrations, to better present and assimilate complex theoretical material. The demonstration of drawings, graphic constructions on the screen organizes and visually presents the text of the lecture. Lectures are much more interesting, the video sequence contributes to the development of spatial thinking, increases the level of mastering the material in question, increases the cognitive activity of students.

RESULTS

The use of slides with a frame-by-frame breakdown of graphical constructions contributes to a better assimilation of special terms and concepts, forms students' professional skills and skills, and develops spatial thinking. Presentations of lectures on the course of descriptive geometry are developed for engineering students in the following sections: orthogonal projections, axonometry, projections with numerical marks, shadows, perspective, and posted on the website of Tashkent State Technical University.

In the face of declining volumes of audience pressure, great attention is paid to the independent work of students. For the correct and effective organization of students' independent work, specialized educational and methodological literature is needed, it is necessary to provide each student with textbooks, manuals, workshops, workbooks, individual graphic tasks. The emphasis on independent work requires appropriate methodological support, containing basic material, which is widely illustrated by examples and contains a number of tasks and graphical tasks for independent work. The presence of such methodological developments allows students to master the material consistently and more deeply. For students of designers at the rate of descriptive geometry, workshops and workbooks for the following sections were developed and posted on the website of the Tashkent State Technical University: orthogonal projections, projections with numerical marks, shadows, perspective.

For each course topic being studied, textbooks and graphical tasks are provided in the workshops, workbooks, examples of typical tasks are given at the end of each topic with their detailed solution and corresponding explanations, control questions on the main topics are given. In addition to the electronic version of the course's training materials, the full range of methodological support for the course is also available in printed form. Workshops and workbooks on paper are in the library of TSTU.

To exercise control on the formation of knowledge, skills and competencies of students in the course of descriptive geometry developed computer tests. The fund of appraisal tools includes electronic tests and "paper" control options. Intermediate control and exams are conducted in the form of computer testing of students in specialized computer classrooms.

An important form of organization of students' independent work is research work, which introduces students to the modern scientific achievements of applied geometry. The use of computer technology in scientific work allows us to accelerate the receipt of results, to make research more interesting.

DISCUSSION

Currently, work is underway at TSTU to place all the components of the course of descriptive geometry for engineering students in the program environment. Lectures, graphical tasks, assignments, tests, test questions on topics, examples of solving typical problems in all sections of the course of descriptive geometry will be available to students in the learning environment of the program.

A modular, object-oriented dynamic learning environment is a free learning management system that focuses on the organization of interaction between the teacher and students and organizes:

- traditional distance courses;
- support for full-time study;
- knowledge test and training with the help of tests and assignments.

The experience of using information technologies in the classroom shows that computer technologies allow:

- activate students' cognitive activity;
- to conduct lessons on a high aesthetic and emotional level;
- to ensure a high degree of differentiation of learning;
- to increase the amount of work done in class;
- improve knowledge control;
- to organize the educational process rationally, to increase the effectiveness of classes;
- to form research skills;
- provide access to various reference systems, electronic libraries, other information resources.

CONCLUSIONS

As a result of the use of computer technology in the process of learning, students efficiency increased during the class time, independent work on graphic tasks, while preparing for practical classes, while preparing for exams, the students' academic progress increased.

Modern high-tech information educational environment has broad and far from fully conscious theory and practice of education opportunities for creating and using innovative models of the educational process, which are based on humanitarian bases: social networks, humanitarian technologies, i.e. addressed to man and to man [4-5].

The model of education for the period up to 2020 places one of the areas of innovative education a new type of education, characterized by a large amount of independent work and the active involvement of students in real projects, the successful implementation of which is impossible without a sustainably formed project culture of future specialists.

REFERENCES

1. Anisimov P.F. New information and educational technologies as a factor in the modernization of the school. // Secondary vocational education. Moscow. №6. 2004. p.2-5
2. Avdeyuk O.A. The problem of adaptation of students to the conditions of the university and teacher assistance in its solution / O.A. Avdeyuk, E.H. Aseeva, I.A. Tarasova // In the world of scientific discoveries. - 2011. - № 4.1 (16). - Ser. Humanities and social sciences.
3. Information and communication technologies in innovative training of specialists: a textbook.-method. manual / ed. T.N. Noskovoy. - SPb .: Publishing House of the Russian State Pedagogical University. A.I. Herzen, 2007.
4. Russian education - 2020: a model of education for the economy based on knowledge: to IX International. scientific conf. "Modernization of the economy and globalization", Moscow, April 1-3, 2008 / ed. Ya. Kuzminova, I. Frumin; State un-t "High School of Economics". -M., 2008.
5. Madumarov K., Khamrakulov A. Independent study of descriptive geometry. // "Problems of Education" scientific and methodical journal. Ministries of Higher and Secondary Special Education of the Republic of Uzbekistan. 2005 No. 1-4, p. 6970.