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The main disadvantages in the teaching of graphic disciplines and how to eliminate them

Abstract: The introduction of modern methods in the work of the teacher is an important condition for improving the learning process, creating a favorable developing environment for the development of professionally significant skills of the future specialist. A significant drawback in the field of application of teaching methods is the underestimation of the benefits of using computer technology in teaching engineering graphics, the uniformity of the methods and tools used. Analyzing this deficiency, every year the possibilities are expanding to improve the quality of teaching graphic disciplines and improving the process of teaching students.

Key words: learning process, engineering graphics, descriptive geometry, computer graphics, spatial thinking.

The transition to the level system of higher professional education requires the solution of many organizational and methodological difficulties. A large-scale technological modernization of vocational education and, above all, of the educational process itself is needed. It is necessary to translate it into active and interactive teaching methods.

Now it is obvious to theorists and practitioners of education that the main factors for the development of a professional personality are substantively practical activity and interaction between people. Indeed, as many years of experience in the vocational education system show, learning is effective and achieves good results if: students are open to learning and are actively involved in relationships and cooperation with other participants in the educational process; get the opportunity to analyze their activities and realize their own potential; can practically prepare for what they have to face in the near future in their life and professional activities; they can be themselves, not be afraid to express themselves, to make mistakes, provided that they are not condemned for this and do not receive a negative assessment.

A significant drawback in the field of teaching methods is the underestimation of the theory in the course of engineering graphics and descriptive geometry, the uniformity of the methods used. In the first year of our teaching, we considered the course of engineering graphics to be exclusively a “practical” subject, did not systematically set out the course material, did not inform the students of the necessary information necessary to solve various tasks of any section, did not substantiate the accepted conventions when depicting certain machine parts. Analyzing these and other mistakes, every year we improve the quality of teaching graphic disciplines and improve the process of teaching students. In organizing and conducting practical classes, a major disadvantage is the overload of students. This overload arises due to various reasons, the main of which is the long adaptation of first-year students in the new learning environment. The teacher is obliged to take into account this factor, creating a favorable environment for the development of each student as a creatively active person. In developing and issuing assignments, clearly indicate the purpose of the assignment, determine the content of the individual assignment, the deadline. We will also coordinate the complexity of the work with the time budget of students. In the process of learning, at all stages of this process, we attach particular importance to the independent work of students, the use of modern computer technologies. The absence of these forms of work with students negatively affects their interest in the learning process and the subject of engineering graphics.

Independent work not only contributes to the formation of professional competence, but also ensures the process of developing methodological maturity, self-organization skills and self-control of educational activities. This is especially important because involves the formation of a future specialist as a subject of professional activity, capable of self-development, design and transformation of their actions.

It is also necessary to remember to maintain the relationship between graphic disciplines and other subjects. In the process of learning we outline the following ways to establish communication of graphic disciplines with other disciplines and practices:

- connection with the disciplines studied in high school: geometry, drawing, physics;
- attraction of personal experience of students;

- the message of a new material from area general technical and special disciplines;
- attracting examples from the practice and future specialty of students;
- maintaining communication with graphic disciplines by teachers of related disciplines.

For example, a large number of various examples from practice should be used when studying the topic of conjugation of lines. Such examples are: architectural breakdowns, traffic light panels, rails, connecting rods, rolling profiles, contours of various technical details (gaskets, casings, guitars, covers, bearings). The teacher should give students the opportunity to independently choose a vital example on a specific topic. At the same time, good life examples should be encouraged, which contributes to the development of observation in students.

When conducting classes by any method, we observe strict scientific terminology adopted in graphic and related disciplines. We set for ourselves the main tasks: to be proficient in the stated material; constantly monitor your speech; not lag behind life, catch in time the changes that occur in the language, timely acquaint students with them; follow that in the classroom students competently operated with terms. The use of incorrect terminology contributes to difficulties in work, hinders the success of the business, leads to poor development of professional skills. Very often, students, without knowing the names of the parts, call them "pieces", or, for example, say "phi" and incorrectly perform the sign of diameter (\varnothing). Any errors in technical terminology are unacceptable, so you should immediately pay attention to them students, correct them. These actions form organization, allow to improve the student's own speech. In the process of teaching graphic disciplines in a technical college, features were identified that adversely affect the academic performance of students. These features include:

- the low level of school preparation received by the university, which requires additional efforts and training in the educational process, this is due to the weak level of teaching the subject "Drawing" at school or its absence;
- the lack of psychological readiness of the student to study graphic disciplines, due to frivolous attitude to the academic subject,

and the learning process at the university, as well as the sharp difference between university life and school life;

- graphic disciplines, namely “Descriptive Geometry” and “Engineering Graphics”, are unusual for students and completely new to their perception and understanding, and require special abilities and skills from students (spatial imagination and presentation, creative approach to solving problems, skills independent work, the ability to analyze, etc.) the lack of which requires additional time and effort on the initial development, and then mastering the elementary techniques of drawing. In our opinion, to eliminate the above reasons, the following measures should be taken:

- hours of graphic disciplines (drafting and computer graphics) in the distribution of school load over time should be increased, and more focused on the development of missing skills and abilities;

- the subject “Drawing” should be studied continuously, starting from elementary school;

- on geometry or drawing lessons, it is necessary to introduce sections of descriptive geometry, for quick inclusion of students in the process of studying a difficult discipline for them. Along with the development of absent abilities, the process of studying graphic disciplines is aimed at the initial formation of students of the professionally significant personal qualities of a future specialist, which are developed and improved with each year of study at the university.

Education in a technical university provides a basis for the further development of professional skills in industry. Competent (consistent, systematic) study of graphic disciplines can affect the initial formation of signs of professionally significant personal qualities, and not develop them completely. The use of modern computer technologies in the teaching of engineering and graphic disciplines allows to increase the efficiency of the educational process, the level of awareness and training of students, systematize knowledge, greatly individualize learning, it gives impetus to the development of self-study skills, mastering high technologies and modern tools, a certain literacy working with information sources, which is also a prerequisite for further professional high school graduate growth [1].

The effectiveness of the educational process largely depends on how much the teacher orients himself not only to form a certain

amount of knowledge in students, but also to reveal their potential abilities for independent activities, their ability to find solutions in difficult life situations. The student becomes the subject of cognitive activity with the teacher; the teacher does not dominate, but accompanies this activity, contributing to the development of the student's research skills, the ability to creatively use and assimilate educational information, analyze problems, set and solve problems.

The use of computer programs, namely AutoCAD in the study of engineering graphics, allows you to form spatial imagination (mental process, which consists in creating new images by processing the previous cognitive perception process, which promotes the free manipulation of ideas fixed in the memory of objects) and creative imagination (independent creation process). new images, a set of abilities, which allows to obtain a product of activity that differs by novelty high perfection and social significance). It requires the selection of materials necessary to build the image in accordance with his own plan.

In the learning process, it is advisable to apply tasks with elements of theoretical calculations, geometric modeling, problem solutions, as a result of which students can show creative ability, imagination, knowledge and skills. A striking example is the following creative task on the topic "Intersection of surfaces": a student must make a model of two surfaces (for example, conical and cylindrical) out of paper (cardboard). Then to subject these models to intersection, that is to execute the model of intersection of two surfaces. After that, develop a drawing on this topic, that is, perform the intersection of these surfaces in three projections and depict the axonometric projection of the model. To some extent, this kind of task can be called design. They develop spatial thinking and imagination, as well as the creative effort of students, increase interest in the discipline, the individuality of each student, increase the motivational orientation of the learning process, contribute to the development of professional competence of the student and teacher, forms the need for self-education among students. Such tasks can also be used when teaching "Computer Graphics". It is advisable to create the same drawing on the topic "Intersection of Surfaces" and a model in axonometric projection in AutoCAD or develop multimedia presentations for the design of this project. Moreover, the use of modern information graphic technologies in the educational activity

contributes to the formation of the professionally significant qualities of students.

In practical classes in engineering graphics, it is advisable to use a partial search path, which assumes that the student, under the guidance of a teacher, performs an independent activity in drawing. At the same time, we put forward the problem and together with the students we outline the way to solve it. For example, students need to carry out a drawing of the detail in three views of its visual image. Solving such a problem by building species requires creative thinking and spatial representation, especially when the part has a more complex, unfamiliar form. At this point, the student should think what is needed to identify all parts of the part, maybe these are cuts and sections.

In addition, to perform such tasks, it is advisable to direct students to the use of computer graphics. For example, before making a drawing of a given part, build its visual image in AutoCAD. The interface of this program provides that the resulting image can be rotated from any side, cut by the plane of any position, thereby facilitating the presentation of the shapes and elements of the part. In addition, the model details in the visual image, it is advisable to transfer to the drawing details in A3 format. The result will be a complete drawing of the part containing its three views and an axonometric projection.

It is important to organize this kind of computational and graphic work as a self-teaching mode for students, for the purpose of problem-based learning, when a task is posed in the form of a specific problem and it is necessary to find its optimal solution.

Modern methods of teaching students are based on new design technologies, in which computer graphics occupies a central place. The use of computer technology is a prerequisite of the modern learning process. The most convenient for use in teaching the basics of computer graphics is the program "AutoCAD", designed for direct design. The experience of teaching the AutoCAD program has shown that it is quickly and easily mastered by students, significantly speeds up the process of developing drawing documentation and significantly improves its quality.

Working in the AutoCAD editor, the student operates with such graphic concepts as drawing, type, projection, title, scale, roughness, size, tolerance, conjugation, etc. Modern computer technologies in the

process of teaching allow students to solve creative problems with design elements. Developing assignments for classes in computer graphics, we build the learning process in such a way that students take part in the creation and implementation of an educational-methodical complex on engineering graphics for themselves and subsequent generations of students. This work forms the professional competence of future specialists. And so, considering all the above and many other shortcomings in teaching engineering students, it is important to create such psychological and pedagogical conditions in which the student can take an active personal position and fully express themselves as a subject of educational activity.

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Графикалық пәндерді оқыту: негізгі сұрақтар және оларды жою әдісі

Аннотация: Мақалада оқытушының жұмысындағы қазіргі заманғы әдістер талқыланып, оқу процесін жетілдірудің маңызды шарты, болашақ маманның кәсіптік маңызды дағдыларын дамыту үшін қолайлы дамушы органы құру болып табылады. Оқыту әдістерін қолдану саласындағы кемшіліктер инженерлік графиканы оқытуда компьютерлік технологияны пайдаланудың артықшылықтарын төмендету, пайдаланылатын әдістер мен құралдардың біртұтастығы болып табылады. Бұл кемшілікті талдай отырып, графикалық пәндерді оқыту сапасын жақсарту және студенттерді оқыту үдерісін жетілдіруіне ұтымды әдістер ұсынылады.

Кілт сөздер: мәдениет, көркем мәдениет, ою-өрнек, педагогикалық негіз, мәдени мұра, ұлттық өнер, білім.

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Преподавание графических дисциплин: основные вопросы и способы их устранения

Аннотация: В статье рассматриваются внедренные современные методы в работе преподавателя, которое является важным условием совершенствования процесса обучения, создания благоприятной развивающей среды для развития профессиональнозначимых умений будущего специалиста. Недостатком в области применения методов преподавания является недооценивание преимуществ применения компьютерных технологий в преподавании инженерной графики, однообразии применяемых методов и средств обучения. Анализируя этот недостаток, предлагаются методы для повышения качества преподавания графических дисциплин и совершенствования процесса обучения студентов.

Ключевые слова: оқу үдерісі, инженерлік графика, сызба геометриясы, компьютерлік графика, кеңістіктік ойлау.

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