



## Application of Pedagogical Technologies in Teaching Module "Positional the Tasks" on the Subject "Engineering Graphics"

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**Abstract:** The article analyzes the experience of foreign educational institutions in studying the problem of teaching engineering graphics using modern pedagogical and information technologies. An analysis was also made of the use of educational technologies for teaching descriptive geometry and engineering graphics in the educational process of the Tashkent Transport University.

**Keywords:** Pedagogical technologies, interactive teaching methods, positional tasks, independent work, creative thinking, information technology, engineering graphics.

### INTRODUCTION

In one of his speeches, President Sh.M. Mirziyoyev noted that "An important task is the further development of not only public education, but also education in universities." Today's requirement is the organization of the educational process, the training of intellectually gifted personnel, combining the materials of historical sources and the innovations of new modern technical developments.

The traditional teaching technology is carried out mainly in the form of "teacher-student", in which the teacher and the student are considered as objects of the educational process. The pedagogical technology is based on the system "Teacher - education - student", in which the student becomes a subject, that is, an active participant in the educational process. In this case, the teacher becomes the organizer and leader, creating conditions for the student to self-study, self-observation.

We achieve this through innovation in education. Interactive learning strategies are among the innovations in education. Modern innovations require an organized, systematic, mass approach to them. Innovation is a long-term investment in the future.

In the process of teaching engineering graphics as a discipline, the following types of classes are used in practice: lectures, practical classes, independent work under the supervision of a teacher, and independent work of students. Before developing the rules and methods of effective educational work, you need to understand for yourself the purpose of a particular type of training. [2]

In order to increase the effectiveness of education, to ensure that the individual is at the center of education, and young people can learn independently, educational institutions need well-trained teachers who own interactive methods, modern pedagogical and information technologies, who can use them in the organization of pedagogical and educational activities. [1]

Like many other disciplines, descriptive geometry and engineering graphics is one of the most important disciplines associated with the development of society, meeting human needs,



mathematics, construction, engineering and other areas. While mathematics is the gymnastics of the mind, descriptive geometry is a discipline that develops the spatial imagination of a person.

The appropriate use of pedagogical and information technologies, interactive methods in teaching engineering graphics is also a topical issue today. Because engineering graphics help the student develop spatial imagination, independent thinking and design skills.

Therefore, it is necessary to pay serious attention to the teaching of such disciplines as descriptive geometry, engineering graphics, computer graphics in educational institutions. That is, there is a need for the effective use of modern interactive methods and pedagogical technologies in the preparation of competitive personnel.

First of all, the teacher must have such a level of knowledge, skills and abilities that he owns interactive methods, pedagogical and information technologies and can use them in practice.

To date, one of the most pressing issues is the implementation of aspects of the study of the educational process in foreign countries with high efficiency, so this issue remains one of the problems in education, traditional forms of education have lost some activity, learning only through speech does not show good results. On the other hand, information training, the use of innovative technologies is more effective in the educational process of foreign countries. In addition, the growth in the volume of information as a result of the rapid development of science and technology, their use in the educational process requires a modern teacher of scientific potential, skills and a high level of pedagogical excellence.

It is difficult for students to adapt to the projection. It is difficult to imagine and understand the solution of positional and metric problems, both in space and in diagram (working situation). To overcome this difficulty, it is necessary to effectively use the best interactive methods and pedagogical technologies in the learning process (lectures and practical classes). This determines the relevance of the topic.

In addition, using a comparison of the advantages and disadvantages of solving positional problems in different ways (comparative analysis), the achievement of the objectives of the lesson will be accelerated and the quality will increase.

Today, a teacher must be able to effectively use information and communication technologies, along with interactive methods and pedagogical technologies. It is necessary to know the use of applied software in pedagogical activity, methods of creating electronic educational materials in MS Office programs (Microsoft Word, Excel, Power Point, etc.).[6]

Technologies used in the process of innovative education are called innovative educational technologies or educational innovations. Educational innovations are forms, methods and technologies that can be used to solve an existing problem in the field of education or the educational process based on a new approach and guarantee a more effective result than before.[8]

If classes and independent work are carried out with a wide and effective use of innovative technologies, interactive teaching methods, game technologies, students will develop the ability to think actively and logically.

Currently, innovative methods and group forms of education are widely used, which help students get interactive learning, increase interest in the subject, develop independence and activity, and develop critical thinking. In the process of teaching descriptive geometry and engineering graphics, it is important to teach students to think creatively, change situations, organize activities on the basis of free competition, as well as their ability to use information technology, electronic textbooks, and multimedia in practice.[7]



The teacher develops students' skills through interactive learning, independence, self-control, self-management, effective communication, working with peers, listening and understanding their opinions, independence, creative, critical thinking, promoting alternative ideas, the ability to form feedback.[4] Such qualities as freedom of speech, upholding one's point of view, the desire to find a solution to the problem.

Most importantly, through the use of interactive learning technology, the teacher gets the opportunity to objectively evaluate the interaction of students based on organization, management, control and analysis to achieve a specific learning goal.

Today, the following main forms of interactive learning are widely used in the global education system:

- Creative task
- Testing
- Distance learning
- Solving a problem situation
- The holding of trainings
- Didactic games (business, role-playing and simulation games)
- Social project (competition, forum, interview, action, show, exhibition)
- Use of social resources (invitation of a specialist, excursion)
- Study and consolidation of new material (interactive report) [11]

From the image of Monge on the diagram, you can find out the spatial position, structure (shape), dimensions (metric characteristics) of any geometric object. This drawing has "reversibility", i.e. an object described on the basis of a drawing can be completely and accurately reconstructed. The linear dimensions of an object allow you to accurately know the distances between objects, the angles between parts of an object or between different objects, the areas of flat (flat) geometric objects and the sizes of objects. If a geometric object is in a special state in space, i.e., parallel or perpendicular to the projection planes, then their position relative to each other (positional characteristic) is easily determined. However, if a geometric object is in a general position on the projection planes, it is much more difficult to determine their relative position.

Positional problems are often solved using auxiliary planes or lines. The actions that are performed to determine the position or belonging of objects relative to each other in the drawing itself are called positional questions. Positional problems include the intersection of a plane and a straight line, the position between a point and a line, the intersection of planes, the intersection of surfaces, the spread of surfaces, and so on. Positional questions are solved in different ways. These include: the method of planes in a particular case. Positional questions constitute one of the main parts of the course of descriptive geometry and are not only of theoretical importance, but also play an important role in the professional activity of an engineer. [12]

In my opinion, developing one problem using different methods will reveal the logic of the problem to the student. Positional problems are used to determine the relative position of geometric objects and the metric properties of objects (the dimensions of the object and its parts). Tasks that determine the size (metric characteristic) of an object, that is, determining its size according to the projection drawing of an object, are called the correct metric task.



In general, the use of interactive methods in teaching descriptive geometry and engineering graphics in universities, in addition to increasing the activity of students, also contributes to the development of creative abilities and graphic literacy among future teachers. The decision on the cooperation of students and teachers in the educational process, increasing activity also helps students to effectively master knowledge, develop their personal qualities.

Findings

### CONCLUSIONS:

The need for teaching discipline:

- the use of interactive methods, pedagogical and information technologies is an important requirement of modern problem-based learning in the system of higher and professional education;
- technologies that develop critical thinking;
- developing educational technologies;
- gaming technologies;
- differentiated and individual learning technology;
- technology of programmed learning;
- Computer and information technologies.

It is necessary to train future specialists to think creatively, adapt to changing situations, organize activities on the basis of free competition, and also ensure that they use information technologies, electronic textbooks, and multimedia in descriptive geometry classes. This requires students to develop independence, free thinking, analysis of educational activities, and in the future, professional skills and computer literacy become their internal needs.

### REFERENCES:

1. Ruzieva D., Usmonboeva M., Holiqova Z. Interactive methods: essence and application / Met. - T.: DTPU named after Nizami, 2013.
2. Asanaliev Melis Kazykeevich. Pedagogy of higher professional school. "METHODOLOGICAL FEATURES OF TEACHING ENGINEERING GRAPHICS IN AN EDUCATIONAL INSTITUTION".
3. Nam A., Saidova Sh. Pluses and minuses of computerization in teaching engineering graphics at a technical university // Society and innovations.– 2022. – T. 3. – №. 4/S. – C. 338-343. <https://doi.org/10.47689/2181-1415-vol3-iss4/S-pp338-343>
4. Muslimov N.A. and others. Basics of pedagogical competence and creativity. Educational-methodical manual. - T. : “Sano-standart”, 2015.
5. Nam A. L. The relevance of the introduction of e-learning in the system of higher education of the Republic of Uzbekistan // Young scientist. – 2018. – №. 22. – C. 341-343. – EDN XPVBUD.
6. Nam A. L., Rakhimov S. The Need To Use The Matlab System In Teaching Academic Disciplines In Training Technical Specialists // Central Asian Journal Of Theoretical & Applied Sciences. - 2021. - Vol. 2. - No. 5. - S. 160-164. <https://cajotas.centralasianstudies.org/index.php/CAJOTAS/article/view/171>.



7. Raximov S. D., Sodiqov S. S. Texnik soha mutaxassislari o ‘quv fanlarini o ‘qitish tayyorgarlik jarayonida C++ dasturidan foydalanish zarurati //INTERNATIONAL CONFERENCE: PROBLEMS AND SCIENTIFIC SOLUTIONS. – 2022. – T. 1. – №. 7. – C. 115-118.
8. Muslimov N.A. and others. Innovative educational technologies. Educational-methodical manual. - T.: “Sano-standart”, 2015.
9. Muslimov N.A. and others. Basics of pedagogical competence and creativity. Educational-methodical manual. - T.: “Sano-standart”, 2015.
10. Tolipova J.O. Pedagogical qualimetry. Study guide. - T. : TDPU, 2015.
11. Rahmonov I., Valiev A.N., Valieva B.N. Modern technologies of teaching the science of engineering graphics. –T.: “Voriz-publishing house”, 2015.
12. Ruziev e.I., Ashirboev A.O. Methods of teaching engineering graphics. T., “Science and technology”, 2010.