



PROBLEMS AND SOLUTIONS OF FORMING STUDENTS' INDEPENDENT THINKING SKILLS

Khamrakulov Abdurakhmat Karimovich

Candidate of Pedagogical Sciences, Associate professor, Namangan Engineering-Construction
Institute: Namangan, Uzbekistan

E-mail: abduraxmathamraqulov@gmail.com

<https://orcid.org/0000-0002-6138-1105>

Abstract: This article talks about the role of independent learning in training, as well as the problems and solutions of using multimedia technologies in the development of independent thinking of students.

Key words: multimedia, engineering graphics, multimedia technologies, computer graphics, independent thinking, independent learning, independent work, spatial imagination.

Introduction

Nowadays, special attention is being paid to the quality of personnel training. An encyclopedist, or "scholar", knows everything. "Skillful" or "Skillful hands" means everything can be done, and an engineer knows everything, can do everything, invents something that has never been done before [5]. In the credit module system of education, special attention is paid to independent education. That is, 50% of the educational load is classroom hours and 50% is independent education. This situation justifies the relevance of the topic.

Independent education is the independent work of the student in the organization of education (under the guidance of the teacher) and independent education at the discretion of the student.

In the organization of independent education, the use of multimedia technologies and practical graphic programs plays an important role in students' independent learning of science. Independent education helps students develop independent thinking.

Background and Literature Review

Many teachers, psychologists and stylists were engaged in the formation of independent thinking (perception) of students. In scientific articles by G.M. Anorqulova [1], A. Umarov[2], I.Ya. Lerner [6], N.V. Pan [9], N.A. Polovnikova [10], Q. Olimov[7], Q. Ishmatovlar[3, 4], who have theoretically developed ways to solve the problem of transferring the level and indicators of independent thinking from one level to another in scientific research. G.I.Shukina analyzed the process of interest in thinking and established that independent thinking depends on the level of development of interest in thinking.

Methodology

Analysis of scientific methodological literature, interview, and observation methods were used in the research.

Students' activity and problems of independent thinking are one of the didactic roots of the practice. If pupils and students are not active and cannot imagine spatially, the activity of the teacher will not have meaning [8]. In order for students to think independently, independent education should be properly implemented. The development of teaching methods should first of all be aimed at making students think independently and be active. Computer technologies can effectively help students to think freely and form their spatial imagination.

To solve the above problems, computer technologies and computer graphics can be used in the teaching of drawing geometry. The integration of these two subjects will ensure that students will complete course work, course projects and diploma projects in future subjects with the help of computer graphics. By the present time, the correct proportion of the use of new pedagogical technologies, traditional teaching methods and computer technologies guarantees the success of the lesson. Some scientists have the wrong opinion that with the introduction of computer technology, some sciences (drawing geometry) will give way to computer graphics. It is impossible to learn computer graphics without studying drawing geometry and engineering graphics, because the practical programs of computer graphics are developed based on the rules of drawing geometry and meet the requirements of world standards (for example: types of lines, designation of materials in sections, etc.). The use of computer technologies (as a modern tool of technical education) in the teaching of drawing geometry and engineering graphics and the solution of drawing geometry problems in computer graphics to show the spatial solution of the problem (determining the intersection of surfaces and showing a clear image of the object in other) can be applied (Fig. 1).

If the use of computer technologies serves for students to quickly learn science, the use of computer graphics allows students to independently carry out their practical work with the help of the computer. The use of modern teaching equipment is very widespread in our republic, and the first of the modern issues of teaching the science of drawing, geometry and engineering graphics in the professional education areas of higher educational institutions is the use of computer technologies. There are the following problems in the use of computer technologies and computer graphics in the teaching of drawing geometry and engineering graphics:

- lack of computer graphics audiences;
- professors and teachers do not have sufficient knowledge of working with multimedia technologies and graphic programs;

➤ existing electronic textbooks and electronic methodological instructions do not adequately meet didactic requirements.

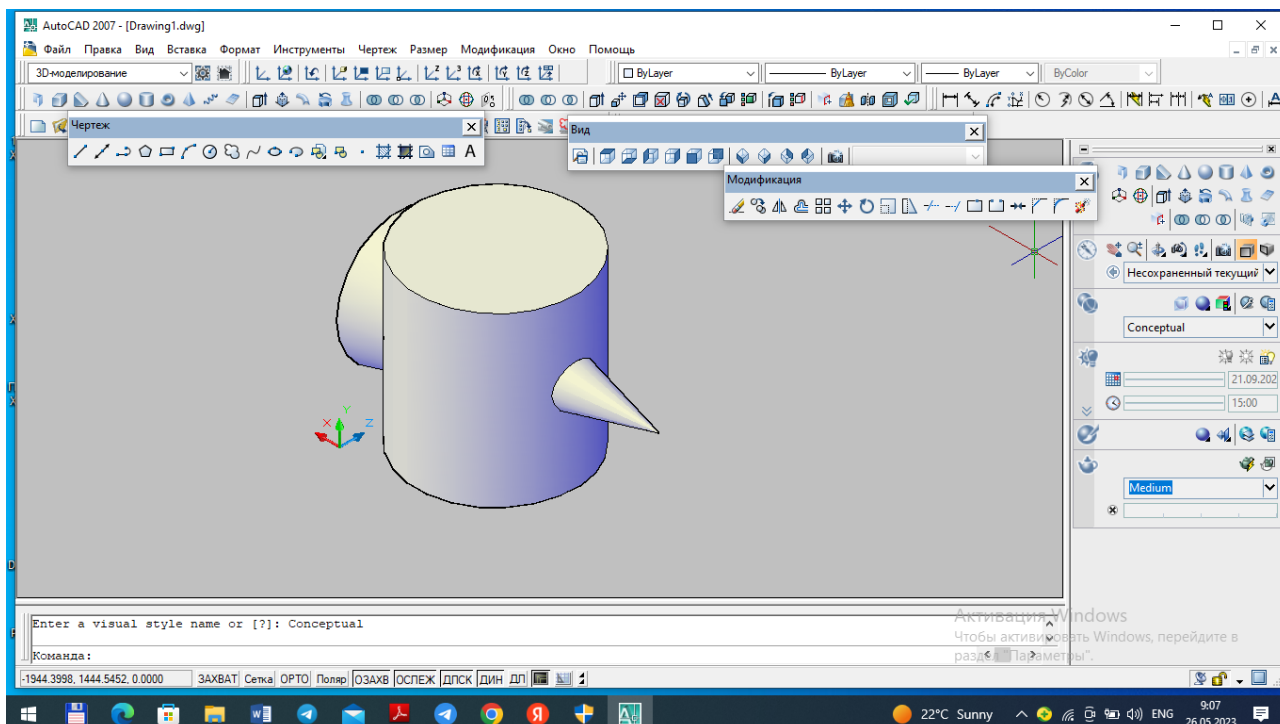


Figure 1. Intersection of surfaces

Since the computer has a great potential, it can be easily used as a teaching tool in every field, as well as in the pedagogical field. Currently, the process of studying in the traditional way is becoming more boring for students.

In the teaching of drawing geometry, teaching technology based on computer technologies creates the following opportunities for pupils and students to learn the subject:

- forms students' spatial imagination. During a regular lecture or practical training, the teacher tries to form the spatial imagination of students and pupils using various visual aids. This process takes a lot of time. When explained on the basis of computer technology, it will be possible to view the spatial views of the plane, projections and clear images by rotating or rotating around the image. This will increase students' interest in science;

- text of lectures created on the basis of multimedia, electronic methodical instructions for practical training are very convenient for students to learn science;

- dynamic images, colors of primitives when giving a problem, when solving a problem, matching its solution makes it easier for students to quickly master the procedure of work;

- when studying the theoretical part of the subject, it is explained with the help of visual aids (color images, their spatial views, dynamic movements);

- the sequence of presentation of the theory facilitates students' understanding;

- the movement of primitives during the assignment of problems and their solution arouses interest in independent work among students;

- step-by-step presentation of the sequence of solving the problem and completion of the assigned task on the computer leads to independent work of students;

– as a result of independent work, the student feels the need for the teacher's help and makes communication with the teacher more intimate.

A person's independent thinking and activity in the social sphere is determined by his activity and entrepreneurship. It is said that the activity of the students in the learning process will reach the goal set by the students during the specified time.

Activity is divided into two levels:

- performance and creative activity;
- reproductive and creative activity.

In some psychological and pedagogical studies, it is divided into three:

- reproductive activity;
- partial creative activity;
- creative activity.

Independent thinking of students is defined as the activity of achieving a goal (solving the problem of reading and understanding) with one's own ability without the help of others during the learning process [8].

Results

The level of independent thinking at this time, in accordance with the cognitive abilities, the result achieved as a result of independent performance of mental and physical work capacity (trudoyomki) of students (reading-perception activity) is considered an effective activity.

In a generalized (global) way, the activity of independent thinking of students can be divided into two main components as a system:

- content (knowledge, understanding or reception and presentation);
- agility (various activities); the resulting side (new knowledge, decision-making methods, new social experience, ideas, views, abilities and qualities of a person). There are two directions of independent perception of students when using multimedia technologies:
 - to provide students with ready-made knowledge, ready-made examples based on the solution of creative problems for correct, accurate, intellectual and practical activities;
 - giving students special and individual problems for independent work.

When independent education was organized in the experimental group on the basis of the above information, there was a large number of students who achieved positive results in completing tasks on the drawing of independent thinking skills and competencies. The number of positive results in the control group was lower than in the experimental group.

Conclusion

In conclusion, it can be said that the use of multimedia technologies and 3D graphic images in the teaching of engineering graphics enhances students' cognitive abilities, their motivation to learn, and develops their spatial imagination and creative thinking skills.

References

- 1) Anorkulova G.M., Tosheva M. Use of problematic situations in the formation of independent opinion in the student. "Development of science and technology" Scientific and technical journal No. 2/2018.
- 2) Abdusalam UMAROV. Being able to work independently leads the student to maturity. New Uzbekistan. April 23, 2023.

- 3) Ishmatov Q. Pedagogical goal setting technology. "Pedagogical technology" training manual, Namangan engineering-pedagogical institute small printing house, 2004
- 4) Ishmatov Q. Modern methods of evaluating the quality of education. Methodical guide. Namangan-2006
- 5) Ishchenko V., Sazonova Z. Engineer: work "at the junction" of professions. // Higher education in Russia. –M. 2006. -№4. pp.106-107.
- 6) Lerner I.Ya. Didactic foundations for the formation of cognitive independence of students in the study of the humanities: Abstract of the thesis. diss...doc. ped. Sciences. - M., 1971. - 34 p.
- 7) Olimov Q. Theoretical and methodological foundations of creating a new generation of educational literature from special subjects. Abstract of the dissertation written for the degree of Doctor of Pedagogical Sciences. Tashkent-2005
- 8) Orlov V.I. Activity and independence of students in learning // SPO. –M.2004. - No. 1. pp. 43-47
- 9) Pan N.V. Organization of independent work of students // SPO.-M. 2005. -№3. pp.19-23
- 10) Polovnikova N.A., Study of the process of formation of cognitive independence of schoolchildren in education: Abstract of the thesis. diss. doctor ped. Sciences. - L., 1977. -S. 58.
- 11) Khamrakulov A. Organization of effective use of the AutoCAD feature in teaching descriptive geometry //Journal of Pharmaceutical Negative Results. – 2022. – C. 2644-2648.
- 12) Khamrakulov Abdurakhmat Karimovich. (2022). INTRODUCTION OF COMPUTER TECHNOLOGY IN EDUCATION. *INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, IT, ENGINEERING AND SOCIAL SCIENCES* ISSN: 2349-7793 Impact Factor: 6.876, 16(11), 13–16. Retrieved from <http://www.gejournal.net/index.php/IJRCIESS/article/view/1327>.
- 13) Kahharov, A. A. (2021). Intensive Methods of Developing Students' Spatial Imagination in the Teaching of Graphic Sciences. *Annals of the Romanian Society for Cell Biology*, 11885-11892.
- 14) Khamrakulov Abdurakhmat. The role of information and communication technologies in independent teaching // Pedagogical mastery Scientifictheoretical and Methodological Journal No. 2, 2020, pp. 58-61 9.
- 15) Khamrakulov A. K., Tubaev G. M. Possibilities of using computer technologies in teaching descriptive geometry // Nauka. Mysl' – 2016. – №4; URL: wwenews.esrae.ru/31-29310.
- 16) Khamrakulov A. K. The role of information and communication technologies in teaching descriptive geometry and engineering graphics. *Nauka. Mysl'* – 2016.– №9; URL: wwenews.esrae.ru/46-56411.
- 17) Zakriyo Buzrukov, Abdurakhmat Khamrakulov. Joint work of a flat frame and pile foundations under dynamic impacts // International Scientific Conference "Construction, hydraulic engineering, water resources". "Construction Mechanics, Hydraulics and Water Resources Engineering" (CONMECHYDRO-2020). Tashkent, TIIMSH, April 23-25, 2020 12.
- 18) Karimova D., Khamrakulov A. K. METHODOLOGY OF WORKING PROBLEMS OF STRAIGHT LINES PARALLEL TO A STRAIGHT LINE AND CROSSING IT //Vestnik Nauki end Tvorchestva. – 2021. – no. 11 (71). - S. 21-25.