METHODOLOGY OF PROVIDING VISIBILITY USING ANIMATED ELECTRONIC LEARNING RESOURCES IN THE GRAPHIC EDUCATIONAL PROCESS

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Abstract-This article is about further increasing their knowledge and shaping their spatial imagination by means of animation electronic educational resource, which is one of the main factors in the design thinking of future engineers-builders through the process of graphic education. In particular, in order for engineers-builders to gain knowledge and fully understand the essence of the subject, it is necessary to make effective use of demonstration materials in training sessions.

Key word- standard, enthronement of drawings, demonstrability, graphics, effective lesson, understanding, necessity, drawing, training, sequence, coherence, didactic demand, animation.

The current advanced science and technology development has somewhat changed the requirements for graphic preparation of students of higher educational institutions in the field of construction. The technology of teaching graphic subjects has undergone significant development. A modern educational facility is filled with the latest software and multimedia graphics packages and complexes. One of the main requirements for students' competencies in the curricula is the acquisition of computer graphics. Therefore, today there is a need to improve the process of teaching graphic sciences, especially in the field of construction.

Yu.F. Katkhanova stated: “The high rate of development of computer technologies leads to a natural re-evaluation of the attitude not only to the existing knowledge system, but also to the search for new ways to improve the traditional methods and methods of teaching” [Katkhanova Yu. F. Komputernye tekhnologii na urokax izobrazitelngo iskusstva / Yu. F. Katkhanova, O. V. Karavaeva // Nauchnye issledovaniya: ot teorii k praktike. – 2016. – No. 1. - S. 36–40].

The difference between methodology and technology can be explained as follows:

- the methodology, in our opinion, is a joint set of educational content and organization of training aimed at educational goals. Methodology, methods and methods or methodical system with the same content can give different results in two teachers;
- when pedagogical technology is used, different teachers can get the same result, although they use different tools and methods in different approaches.

One of the most effective ways to choose technologies is a multimedia approach. The following important factors should be considered when choosing technologies for the educational process:

- the importance of ensuring the achievement of educational goals using new technologies in the educational process;
- that along with the most modern, expensive technologies, cheap and traditional technologies can also be effective;
- the results of training depend not on the type of information and communication or information technologies, but on the quality of creating courses and their transmission;
- it is necessary to emphasize that when choosing technologies, it is necessary to pay attention to the personal characteristics of students, specific aspects of the field of science, the content of the tasks and exercises of training sessions.

A modern lesson is a complex of non-standard ways and methods of teaching, the teacher mobilizes all his skills to achieve certain educational goals and involves students in this process. Directs their ability, competence to learn new information. This is the use of non-traditional forms of education.

According to L.O. Mokresova, the use of innovative forms of education in the teaching of graphic sciences: teaching students to make product drawings using computer graphics, giving video lectures using multimedia equipment, reading subjects on electronic media for independent learning It is related to the creation of a teaching-methodological fund, the use of existing methodological resources by converting the main methodological developments of the department into electronic form, etc.

Based on the analysis of the experience of L.V. Pavlova's innovative teaching methods, the quality of studying the educational material in drawing and computer graphics depends on different teaching methods, for example, the associative-cooperative method and the method of descriptive analogies increase the success of teaching. The purpose of these methods is to develop spatial imagination, to form students' creative, cognitive and engineering-constructive maturity.

Researcher T.V. Chernyakova, using the model teaching methodology of the subject “Computer graphics”, determined the level of teaching methodology, all its components, i.e. giving scientific advice, their interrelationship, principles, methods, tools and forms, and developed scientific recommendations for teaching science. In this model, psychological-pedagogical preparation of students in the teaching of “Computer graphics” to students of higher education institutions, instilling why it is

necessary to learn the subject, determining the further increase of their interest in the subject based on levels, methods, tools and forms are presented.

E.I. Roziev [Ruziev E.I. Nauchno-metodicheskie osnovy podgotovki uchiteley graphici v vysshikh uchebnyx zadevaniyax: Autoref. diss. doc. …pad. science - T., 2005. - 44 p] created the integrative course "Graphics" in his scientific research work and developed the methodology of its teaching. It describes the problems of teaching the subject of “Computer graphics” and its connection with other subjects, the graphic requirements that a teacher of this subject must have.

In her research, A.B. Puzankova believes that the use of appropriate pedagogical technologies is required to significantly reduce the number of slow-learning students at all stages of education through the computerization of general technical sciences. According to J.J.Dzhanabaev, the acceleration of the educational process requires informational training and computerization aimed at a specific goal. Use of new pedagogical technologies in teaching, computerization, provides the basis for accelerating the educational process.

All educational methods have their strengths and weaknesses, so it is necessary to use them in harmony, depending on the purpose, conditions, available time. The quality of education consists of the sum of the quality of teaching and upbringing.

We agree with Ye.Yu. Johova's opinion, taking into account the conditions of teaching the science of engineering computer graphics, the time allocated to the subject, and the peculiarities of graphic programs. In her research work, Ye.Yu. Jokhova presented the peculiarities of computer-based teaching methods. According to the author, there are four main aspects of education in the practice of computer-based teaching:

- visual explanation;
- reproductive;
- problematic;
- research methods can be used;

The reproductive method of teaching using computer technology ensures the assimilation of the knowledge conveyed to the student by the pedagogue and the computer, and the reproduction of the studied material and its application in similar situations, and the organization of the student's activity. The use of this method with the help of a computer can significantly improve the quality of the organization of the educational process, but it does not allow to fundamentally change the educational process compared to the traditional scheme that is used (without a computer). In this regard, it is more reasonable to use problem and research methods.

The problem-based learning method uses the capabilities of the computer to describe and organize the learning process and to search for ways to solve a specific problem. The main goal is to maximize the stimulation of students' cognitive activity. It includes solving various types of problems based on the knowledge acquired in the educational process, as well as extracting and analyzing a number of additional knowledge necessary to solve the problem. At the same time, special importance is attached to acquiring the skills of collecting, analyzing and transmitting information. In order to ensure the achievement of the goals of the educational process in the conditions of reduced study time in the preparation of bachelors, it is necessary to use the auditorium time wisely.

In our opinion, it is appropriate to pay attention to the following factors that determine the effectiveness of education: the form of training;

- selection of optimal combinations of training and control methods;
- pace of teaching;
- scientific, systematic and consistent connection of learning with life;
- an optimal set of educational tools.

Modern pedagogy includes more than 20 organizational forms of teaching. Historically, as a method of transmitting knowledge through a form of communication, the lecture is still an organically intensive and one of the most important didactic systems, designed to achieve the goals of the initial and basic stages of education. The lecture resulted from the transition from individual training to group training. In the lecture, the basics of knowledge and cognitive activity are created, such as an adequate system of attention, memory, imagination, and thinking. A lecture usually includes explanatory material that requires teaching methods such as proof and reasoning. The lecture is still the most common and important form of teaching.

Two types of cognition are usually emphasized: verbal, which is based on speech, and visual, which is based on images. Some of the students have a tendency to receive information delivered verbally, while others require information to be conveyed using images. At such times, it is appropriate to conduct lecture trainings combining both. The method of demonstrating examples is a continuation of the historically organized method of transferring the experience of the older generation to the younger, which consisted of the rule "do as I do". The modern interpretation of this method includes a visual representation of events, processes, problem solving methods and ways of using various tools. The method of demonstrating examples does not involve unconsciously copying certain actions that lead to the desired result, but rather is one of the components in getting your own opinion about the topic being

studied. According to L. B. Grigorevsky, there are not enough textbooks and training manuals for the science of engineering computer graphics, which is part of the science of engineering graphics, therefore, lecture sessions are one of the important and main means of conveying information to students. In addition, in the process of reading a new course, the teacher provides the information that the student should collect from various sources in the form of separate topics and sections.

M. Sroka, Radovan B., Jelena T., H. Stachel and others in Europe and the USA, V.V. Kondratova, J.J. Dzhanabaev, S.V. Panyukova and others in the CIS countries, A.K. Hamrakulov, Ch.T.Shokirova, N.D. in Uzbekistan. Yadgarov, D.S. Saidakhmedova and others have given scientific recommendations on the use of computer technologies at various stages of higher and vocational education in their scientific research work "Drawing geometry and engineering graphics". Among these recommendations, special attention is paid to the principle of visibility.

The visual organization of the educational process of drawing also leads to the perception of educational materials, their conscious and thorough assimilation, and stabilizes attention. It is necessary to prepare demonstration materials in accordance with the type and topic of the lesson, to coordinate them with the age and knowledge level of the student, and to organize their use using effective methods and tools. Demonstration materials in the subject of "Drawing" may be different depending on the type and subject of the lesson. Including:

• Printed materials (posters, handouts, etc.).
• Electronic materials (presentations, forms, pictures, etc.).
• Animated materials (multimedia e-book, e-textbook, etc.).
• Vitrual models (details, house models, machine mechanisms and models).

Computer programs can be used to create visual materials from the discipline of "Construction Drawing" in a modern way. The development of students' spatial imagination is directly related to the level of visibility. If the level of visualization is high, the knowledge acquired by students in science will be effective.

ArchiCAD, AutoCAD, 3ds Max, Revit, Sketchup programs can be used to create virtual object models. Because these programs are designed for computer modeling. It is recommended to create animated educational resources for teachers in the teaching of construction subjects, mainly in AdobeFlash, Photoshop, Adobe Illustrator. First of all, the above programs are adapted to international standards and provide all-round comfort for the teacher. Secondly, this program is designed to work according to the rules of the field of animated electronic educational resources. You can use MS Word, PhotoShop, CorelDraw programs to make posters. Teachers of construction subjects are recommended to use MS Word and PhotoShop

programs. It is convenient for teachers to enter and design texts using MS Word. Has the ability to process and design images in the PhotoShop program.

MS Word, ArchiCAD, Revit, Paint NET programs can be used for the preparation of handouts. With the help of these programs, teachers have the opportunity to prepare the text, graphic tasks and drawings needed for handouts based on the design and quality of the time.

It is possible to create multimedia lesson plans using Adobe Flash, ArchiCAD, Snagit programs. The Adobe Flash program is one of the most convenient programs for converting various drawings and tasks in the field of drawing into an animated view. The didactic cycle of the entire educational process of the e-textbook: theoretical information, problem-solving sequences in an animated form, use in the educational process, control of the level of knowledge obtained, and the availability of a data search system differs from other textbooks.

The multimedia e-book is used for the following lesson purposes:

• Educational goal: students learn theoretical information on the studied subject through spatial visualization and organize graphic assignments based on this knowledge during the practical lesson.

• Educational goal: to clearly understand their sequence in the process of acquiring theoretical and practical knowledge on the studied subject through spatial visualization and to use it as a necessary tool in real life, to form independent work skills and creative abilities.

• Developmental goal: to turn knowledge into skills, and skills into skills, and to develop the ability to work independently on the basis of a developed spatial perception of the subject being studied.

Video lessons are of the following types:

Direct observation of the process of the 1st lesson and the participation of the educator (speaker-teacher) in which there will be opportunities to see, hear, learn and assimilate information.

2. Describes a process that is performed only with or without the presence of a teacher. This section corresponds more to lecture classes. They create an opportunity to acquire information without the help of the teacher if the student has a place or information that he did not understand in the lecture. As a result, it helps to turn the acquired knowledge into a skill and strengthen it. The video lesson that we are talking about was created on the subjects of the field of construction, and it was carried out on selected topics. Based on this, as mentioned above, the organization of video lessons and their use in the educational process are relevant today. There are video lectures on science in Uzbek. But there is not enough information on

practical training. In particular, the lack of video lessons describing the sequence of drawing a drawing, that is, with its algorithm, does not meet today's needs. Tasks based on the above facts can be used as examples of drawing. Because in each lesson, the teacher draws and explains a sample of the task given to the students in practical training. Observations and analyzes show that various questions and problems arise during the tasks given to students and during the student's independent performance. If the student has someone who can provide insight or advice to complete the task, the student completes the task. During practical assignments, students are often at home and there is no one to provide these concepts. As a result, the student can find his teacher the next day (if he can find one) and learn by asking him about the areas of drawing that he does not understand. Otherwise, the work will not be completed.

As a positive solution to these problems, video lessons can be shown using animated educational resources. In this case, students can copy video lessons to computers, tablets, and smartphones. In this case, students can watch the required lesson as many times as they want (that is, until they master it). This leads to the fact that the student's mastery of the lesson is at the required level.

In conclusion, students should be able to read and draw drawings, graphs, and figures while studying technical sciences. For this, a set of assignments is required to be of high quality. The need to develop a new set of high-quality graphics tasks is waiting for its solution. To find an optimal solution to this problem, it is necessary to create an electronic version of a set of graded graphic assignments in science.

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