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ROLE OF COMPUTER GRAPHICS IN DEVELOPING COGNITIVE COMPETENCES OF STUDENTS

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A B S T R A C T

In the following article the modern methods of perfection of the cognitive competencies of the students in teaching the lesson of drawing are analyzed based on the available data.

K E Y W O R D S

Drawing, painting software, project, design, positioning, updated cognitive, digital, autopsychological competencies.

Introduction

Drawing is an important and mandatory subject in lessons for a future technical specialist. Currently, there are many different drawing programs, among which professional (paid) and simplified (free) can be distinguished. For you, we have prepared an overview of the most popular and multifunctional of them. Now you can not only make a light sketch, as well as print out the finished drawing, view and correct it if necessary, but also create your own projects.

Graphite (shareware). Designed to create two- and three-dimensional drawings and diagrams of varying complexity and degree of detail. The program has multiple functionality and tools for fast and accurate creation of drawings. There is a system of bindings in space, the ability to create custom libraries, flexible sizing and much more.

Methods

This program is suitable for students of technical universities, engineers and ordinary users. It allows you to create multi-page PDF documents and provides accurate import and export of drawings in popular CAD formats.

The principle of operation is to build a drawing project from 2D and 3D components. Allows you to create both the simplest drawing and a complex mechanism. It works with three formats: DXF, DWG and DXF.

Unlike the previous program, AutoCAD does not work with the Russian ESCD system, but offers only an international one. Also, the disadvantages include the high cost of the full-featured version.

The most important conceptual position of the innovation platform speaks of the student as an active participant (subject) in the intensification of the process of professional formation of a person who has both general and professional competencies embedded in the Federal State Educational Standard

and additionally updated cognitive, digital, autopsychological competencies. All this is recorded in the Adaptive model of the future teacher of the innovative type developed in our college.

Cognitive competence presupposes the most important, from the point of view of the concept of lifelong education, the skills of critical, systemic, strategic, creative thinking, as well as the skills of designing individual educational trajectories. Information and communication (digital) competence includes: skills of working with educational portals, online course platforms, project communication skills in online communities, skills of creating adaptive electronic textbooks taking into account cognitive styles and types of thinking of students, programming skills of educational games, as well as skills of using digital technologies for self-development. [2, 45]

Autopsychological (regulatory) competence involves mastering the skills of managing physical and psychophysiological resources, emotional and motivational-volitional self-regulation, mastering the skills of time and stress management in professional activities, as well as the skills of psycho-hygiene of information work ("digital diet", "information fitness").

Art projects are essentially universal: they can become high-tech lessons on art topics, educational activities among students, as well as a form of career guidance work of the college among high school students of the city. The main advantage of an art project is that listeners are its active accomplices. Each art project requires a long time to develop and implement among the audience. The following are the main stages of work on the art project.

1. Formation of a creative group of students for work, formulation of the theme, goals and objectives of the art project in drawing.
2. Work on an information project: collection, classification, analysis, processing and generalization of information on the topic.
3. Identification of the main problems in the topic of the art project, development of problematic issues for discussion with the audience.
5. Creating an art project structure.
6. Selection, processing and composition of the texts of the art project.
8. Development of a detailed scenario of an art project.
9. Creation of an electronic support system for an art project: selection, processing and creation of audio and video materials, creation of presentations.
10. Creation of costumes and props.
11. Distribution and learning of roles.
12. Selection and learning of musical compositions, choreographic miniatures, etc.
13. Individual, differentiated, group and consolidated art project rehearsals.
14. Creation of advertising for an art project (advertising posters, booklets, calendars).
15. Implementation of an art project among the audience.

Each of the listed stages of work contributes to the formation and development of the majority of students' skills that make up cognitive, digital and autopsychological competencies – the main components of the Adaptive model of the future teacher of an innovative type.

The most important stage of work on an art project is the so-called "generation of ideas", identification of the main problems on the basis of which its structure will be built, as well as the development of problematic issues for discussion with the audience during the art project (the most difficult universal problem usually becomes a mini-discussion problem).

This stage of work forms critical thinking – the most important component of cognitive competence. Critical thinking is also formed at the initial stage of work on an art project, when collecting, classifying, analyzing, processing and summarizing information on the topic.

When working on art projects, students' systemic and strategic thinking is formed, which are also important components of cognitive competence.

An art project is a special system of presenting new knowledge, forming a kind of educational and educational environment with high information and emotional saturation, rich semantic potential and relative communication freedom. The skills of systemic and strategic thinking are developed primarily when drawing up the structure and scenario of an art project.

The most important component of cognitive competence is the formation of creative thinking. Art design opens up wide opportunities for the manifestation of creative abilities of each student.

When creating an art project, students can: adapt the source texts for the intended audience, compose a script for an art project,

compose artistic texts (for example, scripts for theatrical performances), expressively read texts,

perform a particular role, showing acting skills, sing, dance, play musical instruments, create costumes and props, create ICT accompaniment, create author's videos, create advertising for an art project, organize an audience (develop and conduct games, quests), communicate with the audience, conduct a dialogue (mini-conversations), formulate and argue their point of view, develop and conduct mini-discussions, etc.

During the rehearsals of the art project, the most creative students can also act as stage directors of theatrical scenes in cooperation with the teacher.

Another component of cognitive competence is the skills of designing individual educational trajectories. In art design, students are grouped into small groups of 7-10 people, each of whom is working on their own art project. In the process of work, each student can choose a business "to his liking", in accordance with his capabilities and abilities, everyone makes a feasible contribution to the common cause.

Self-study and mutual training in various types of work, mutual assistance, mutual assistance are of great importance in the course of working on art projects. Many students master almost all types of necessary activities in art design.

As a result, the students themselves evaluate the contribution of each member of the group to the collective work of creating and implementing an art project. Thus, art design makes it possible to form and implement individual educational trajectories of students, including such important stages of this process as interaction, mutual assistance and reflection.

This competence is formed almost throughout the work on the art project. This happens both at the initial stage of art design when creating an information project (collection, classification, analysis, processing and generalization of information on the topic), and in further work - when creating an ICT support for an art project (a system of presentations and videos, often filmed and edited by students themselves, subordinated using hyperlinks). The purpose of using ICT in the course of art design is to achieve a deeper perception of the material through imaginative perception, to enhance its emotional impact, to ensure "immersion" in the era.

Before implementing an art project among the audience, students create advertising posters, booklets, calendars in order to attract an audience and reward the most active listeners-participants of the art project. Students' project communication skills are also developing in online communities, since the

process of working on art projects takes place not only in the classroom, it requires constant communication between members of the creative team and the teacher.

Creativity is one of the most "expensive" activities. The ability to regulate one's own physical, psychophysiological, cognitive, emotional, volitional resources (autopsychological competence) in the process of complex and long–term project activities is an important aspect of the formation of a future teacher of an innovative type. The information obtained during the study of the basics of psychology about personality types and thinking styles, mechanisms of psychological defense and strategies of behavior in conflicts help students to maintain a positive "self-image" in the process of preparing and conducting art projects.

To improve the skills of managing the physical and psychophysiological resources of students, trainings are conducted on team building and the development of creative thinking. Skills of emotional and motivational-volitional self-regulation are formed through conversations, role-playing games, detailed planning of all stages of preparation of art projects. In order to master the skills of time and stress management, a system of express reports is used in communities specially created in social networks ("conversations"), motivating support for "streaming activities" in the game achieve logic (logic of level achievements).

Autopsychological (regulatory) competence also involves the use of a "digital diet". This is not only a temporary refusal to use gadgets during classes and rehearsals, but also the formation of students' ability to find verified information on Internet sites that are verified from the point of view of reliability and scientific information. In general, work on the "skills of the future" included in the autopsychological competence of the future teacher activates the processes of self-knowledge and self-development of the student.

Thus, art design in our college is an effective means of forming the personality of an innovative type of teacher.

In the disciplines of drawing and drawing geometry, auxiliary projection of graphic processes, design functions and motivational-value, practical-activity, reflexive-assessment components are determined by prioritizing the logic of optimally supporting creative activities aimed at finding a creative solution to educational and cognitive tasks;

The model for the development of creative competence of students through the teaching of auxiliary projection methods is improved on the basis of pedagogical design of a technological structure, which strictly defines methodological conditions such as maximum accounting of individual characteristics, ensuring the stability of the creative atmosphere, accelerating dialogical joint activities;

In the disciplines of drawing and drawing geometry, auxiliary projection of graphic processes, design functions and motivational-value, practical-activity, reflexive-assessment components are determined by prioritizing the logic of optimally supporting creative activities aimed at finding a creative solution to educational and cognitive tasks;

The model for the development of creative competence of students through the means of teaching auxiliary projection methods is improved on the basis of pedagogical design of the technological structure, which strictly defines methodological conditions such as maximum accounting of individual characteristics, ensuring the stability of the creative atmosphere, accelerating dialogical joint activities;

The methodology for the development of creative activity in the disciplines of drawing and drawing geometry is improved by increasing the intensity of the degree of re-contact of heuristic methods with

organizational and technical incline, aimed at finding the elements that will be needed in auxiliary projection (construction, projection, technical-design,) in search of the unknown, relying on an associative, intuitive and logical [3, 234]

The pedagogical mechanism for the development of creative thinking of future teachers is improved on the basis of expanding the positive dynamics of compositional-creative activity on the systematic correction of the state of reflexivity with an individual educational trajectory of the system of Subject-subject relations aimed at the manifestation of the student's personal potential.

Discussion

The problem of the development of spatial thinking at a qualitatively new level can be solved by modern computer-aided design systems. Due to the fact that architectural and construction drawing is studied by students of the Art and Graphic Faculty at the end of the course "Fundamentals of Drawing and descriptive geometry", the logical continuation of this course, in our opinion, is the study of computer means of displaying graphic information that have greater visibility, dynamism, high speed of execution of various images, convenient and intuitive graphical interface.

A special influence on the formation of positive motivation is exerted by: the information saturation of the curriculum, its relationship with previously studied material, a clearly realized perspective of the educational work of future teachers, the use of the "success methodology", instilling in the student faith in their abilities and strength, the use of a rating system for assessing students' knowledge.

The modern software used for the drawing lessons:

Adobe Photoshop CC; MyPaint; DrawPlus; Clip Studio Paint; CorelDRAW; Affinity Designer; Autodesk Sketchbook; YouiDraw Drawing; MyBrushes Paint for Mac; Epic Pen; Flame Painter; ChemDoodle; Paintstorm Studio; MyPaint; Mischief; DrawPlus; Clip Studio Paint; Krita; MediBang Paint Pro; Procreate

In addition to these broad-spectrum programs, there are narrowly focused ones. For example, for drawing electrical circuits: DSSim-PC, sPlan, Circuit Diagram and for computer—aided design of microcircuits - ExpressPCB.

Conclusion

A positive motivational attitude to graphic activity can give a significant impetus to educational design. At the same time, the motivation to participate in the design will be determined by the positive attitude of students to the entire educational process, stable internal motives, passion for finding an original solution to the set graphic task.

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