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Development of Professional and Graphic Competence of Future Teachers of Technological Education Based on An Integration Approach Using Personality-Oriented Educational Technologies and Methods

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Muslimov Sherzod Narzulla ugli

Acting Professor of TSPU named after Nizami, Doctor of Pedagogical Sciences (DSc), Uzbekistan

Abstract: The article discusses the issues of developing the professional graphic competence of future teachers of technological education based on an integration approach. The study analyzes the effectiveness of personality-oriented educational technologies and methods and substantiates their importance in improving the professional and graphic training of teachers. The ways of improving the quality of the educational process through the use of modern information and communication technologies, innovative teaching methods and interdisciplinary integration are indicated. The results of the study will serve to improve the system of personnel training in the field of technological education.

Keywords: Graphics, training, technology, integration, approach, ICT, personality, method, interdisciplinary integration, integration approach, professional graphic.

Introduction: civilization is characterized by the fact that integration processes are carried out in all spheres of life: politics, economics, science, culture, education, medicine, etc. Globalization and the integration of economic and social processes lead to the fact that the

countries and peoples of the world are becoming more interconnected, while preserving their sovereignty, language and culture. A striking example of the integration process in the field of education is the Bologna Process, aimed at integrating higher education in European countries. The goal of the Bologna process is to create a single European educational space aimed at developing graduate employment, increasing their mobility and ensuring the competitiveness of European higher education in the world. During the reform of the higher education system in our country, integration processes are also underway: it is important to consolidate higher education institutions of various profiles around their leaders, integrate higher education institutions with scientific institutions so that industrial enterprises work on equal terms. Integration processes are also carried out when determining the areas of personnel training (the formation of a new direction based on two or more specialties), when integrating general professional and special disciplines. "The pedagogical project in the form of a state educational standard, curriculum, curricula and teaching aids is the result of the integrated activities of specialists from various industries. Representatives of different professions participate in the design of a modern pedagogical system at different levels of education (preschool, school, etc.): psychologists, teachers, methodologists, scientists of various fields of knowledge (mathematics, physics, etc.), medical and other workers. The educational process itself, as an object of pedagogical research and design, combines targeted, substantive and technological components, as well as the pedagogical activities of teachers and the educational activities of students. In turn, each of its components acts as a complex integrated system, as a set of interrelated elements. For example, in order to teach, competencies, knowledge, skills, tasks of educating and developing a student's personality are combined; in the content of education - elements of education and various types of student activities; in the technology of the educational process - various methods, means and forms of education. It should be noted that when designing and implementing teaching methods for a particular academic subject, in addition to special knowledge and pedagogical knowledge on this subject, knowledge related to psychology, information technology, management and other disciplines related to the educational process is used; that is, the construction of teaching methods requires the consolidation and use of knowledge from various fields of science.

Graphic competence is divided into three types: computer graphics, engineering graphics, and pedagogical graphics.

Computer graphics is the art and scientific field of creating and manipulating visual images, diagrams, animations, and models using computer technology. Computer graphics are used in many fields such as design, film, games, modeling, and scientific visualization. It allows you to transfer images of the real world into a computer environment and create new virtual worlds.

The main types of computer graphics:

1. 2D graphics (two-dimensional graphics):

- about creating and editing images in a two-dimensional coordinate system.
- types:
- Raster graphics (images consisting of pixels, such as photos).
- A vector graphics (images created based on mathematical formulas such as logos or diagrams).
- Fields of application: web design, graphic design, printing, interface design.

2. 3D graphics (3D graphics):

about creating three-dimensional objects and scenes and visualizing them realistically or stylistically.

- Types of o:
- 3D modeling: creation of three-dimensional objects (boats, buildings, animals.
- 3D animation: Moving objects and displaying them in time order.
- /Applications: movies, video games, virtual reality (VR), simulations, engineering and architecture.

3. Animation:

- About creating the illusion of movement by sequentially displaying images or objects.
- About 2D and 3D animation: You can animate both one-dimensional and three-dimensional objects.

• Applications: cinema, television, games, advertising, education.

4. Computer Design (CAD):

• A type of computer graphics used to create and visualize technical and engineering projects.

• Fields of application: architecture, automotive, mechanical engineering and Industrial design.

• Engineering graphics are special graphical or visual images that are used to visualize technical objects, structures, and systems in a clear and understandable way. It is of great importance in engineering fields, including mechanical engineering, construction, architecture, and industrial design, and accurately conveys technical information through recordings and images. Engineering graphics are usually 2D or 3D and are presented in the form of drawings, diagrams, or models.

The purpose of engineering graphics:

* Visualization and explanation of technical ideas and projects.

* Display of objects, mechanisms, and devices on an accurate drawing or model.

* Use as technical documentation in production, assembly and assembly processes.

Types of engineering graphics:

1. Technical drawing:

About 2D drawings: These are two-dimensional drawings that clearly show the frontal, orthogonal and transverse views of engineering facilities. These drawings are used to accurately determine the size, shape, and other technical characteristics of an object.

About 3D Drawings and models: Allows you to create objects in three-dimensional format, fully visualizing their actual shape and structure. These models help engineers and designers to see objects or mechanisms realistically.

2. Drawings using CAD (computer design): o is used to create designs and drawings using a computer. Using CAD software, engineers and designers can create accurate technical drawings, models, and simulations.

Popular CAD programs: AutoCAD, SolidWorks, Catia, Siemens NX, Fusion 360.

3. Diagrams:

Electrical and hydraulic diagrams: this type of drawings is used to indicate the layout of electrical and hydraulic systems and their elements.

Process diagrams: visual diagrams showing the flows of materials and energy during the manufacturing process.

4. Architectural drawings:

about technical drawings related to the construction, construction and design of buildings and structures. It clearly indicates the dimensions, materials, and structural elements of the objects.

5. Mechanical drawings:

about technical drawings to explain the design and operation of machines and mechanisms. At the same time, each part of the mechanism is clearly shown and their interaction or actions are visualized.

Pedagogical graphics is the use of various visual aids in order to effectively organize and facilitate the learning process. Pedagogical graphics simplify information through various diagrams, diagrams, drawings and visual representations, making it understandable and memorable for students.

The goals of pedagogical graphics are:

* Simplification of information: expressing complex ideas and concepts in a simple and understandable way.

* Facilitate understanding: Ensure that students acquire knowledge better through visual materials.

* Memorization: The ability to memorize information more easily using visual elements.

Types of pedagogical graphics:

1. Diagram and Diagrams:

about Venn diagram: shows the common and distinctive features of two or more sets.

about the Mind Map: visualizes related information around the main idea.

2. Infographics:

about visual representation of statistical data, facts or processes.

The goal is to make it easier to understand and receive information quickly

3. Presentation Tools:

About the presentation of visual information through PowerPoint, Prezi or other presentation software.

about the use of images, graphs and diagrams in the educational process.

4. Animation and Video:

About using animation and video to explain complex concepts.

These tools make it easier to understand through dynamic visual material.

The importance of pedagogical graphics:

* Long-term memory: with the help of visual information, information is stored in memory for a long time.

* Increase student interest: Visual elements can make the learning process interesting and engaging.

* Easy explanation of complex concepts: Technical or theoretical concepts are easier to explain using diagrams and graphs.

Pedagogical graphics are used in various fields of education, including schools, universities, and vocational education, as an important tool for effective learning.

A graphic organizer is a tool used for visual organization and better understanding of information. It allows you to structure and display data using various forms, diagrams, tables or diagrams. This tool is especially used to simplify complex ideas or concepts and make them easier to remember.

The main functions of the graphic organizer are:

* Visual display of information and ideas.

* Identify links between concepts, processes, or events.

* Simplification and easier understanding of complex concepts.

• Helping students in the learning process, making it easier to memorize information.

Types of graphic organizer:

1. Mind Map: Visually shows related small ideas or information coming from one basic idea.

2. Venn diagram: Used to illustrate mutual similarities and differences between two or more sets.

3. Flowchart (flowchart): It is a diagram in which a process or event is shown step by step.

Graphic organizers are widely used in education and daily activities to better understand and organize information.

The professional activity of a specialist is holistic, it implements all aspects of the profession (place of work, subject of activity, tasks to be solved, technique, technology, management, finance, etc.). The relevance of the introduction of personality-oriented educational technologies is also due to the fact that various technologies developed in pedagogy and applied in practice, despite their importance does not cover the entire educational process, but its individual aspects. Indeed, if we analyze the technology of modular learning, it implies a change in the structure of the subject (division into modules). As for the methods, means and forms of training, in this technology they are simply tied to the module without any innovations.

Personality-oriented educational technologies involve the introduction of new learning tools and methods, but the purpose and content of learning remain unchanged. At the same time, when developing teaching methods in any subject, when designing all elements of the educational process (goals, content, methods, tools and forms), in our opinion, it is necessary to ensure the conditions for the use of various technologies. Personality-oriented educational technologies include: information and computer technologies, distance learning technologies, modular, gaming, IMO-contextual and project-oriented educational technologies.

Personality-oriented technologies, which involve the organization of the educational process in accordance

with the needs, interests and abilities of students, taking into account the requirements of society for the professional, intellectual and moral level of personality development of future teachers of technological education, contribute to the awareness of the individuality of each person; serve as a focus on the development and self-development of personal qualities of the student.

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