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THE METHODOLOGY OF DEVELOPING THE PROFESSIONAL COMPETENCE OF FUTURE DRAWING TEACHERS THROUGH THE USE OF 3D MODELING TECHNOLOGIES

Bunyodbek Abdulazizov Islomjon ugli
Lecturer, Faculty of Art Studies,
Chirchik State Pedagogical University

Annotation: This article analyzes the methodology of using 3D modeling technologies in developing the professional competence of future drawing teachers. It demonstrates ways to enhance students' creative thinking, design skills, and readiness for practical activities through the digital learning environment, modern computer graphics software, and 3D design tools. The innovative aspects of the methodology, its didactic principles, and advantages in improving educational effectiveness are lso highlighted.

Keywords: 3D modeling, drawing education, professional competence, digital technology, innovative methodology.

Currently, the ongoing reforms in the education system of our country demonstrate that in today's era of globalization, the demand for specialists in the field of engineering is steadily increasing. In this regard, special attention is being paid by the government to the development of engineering education. As an example, measures have been taken to improve the organizational and managerial activities of higher education institutions that train specialists in engineering and technical fields.

1. Reforms in the field of engineering and technical education include:

- Establishing a working group to conduct a comprehensive analysis of the activities of 33 state higher education institutions specializing in engineering and technical fields.
- Studying the compliance of educational programs and admission parameters with the real labor market needs of relevant industries.
- Assessing the condition of the material and technical base, including the availability of modern laboratories and equipment.
- Aligning existing curricula with industrial technologies and employer requirements.
- Organizing students' industrial practice and practical skill acquisition in production organizations.
- Evaluating the qualifications of teaching staff and the practical orientation of educational resources.

In order to ensure the effective implementation of these reforms, it is necessary to strengthen the formation of students' **professional competence** and to introduce **digital technologies** into the educational process. Among them, **3D modeling software such as AutoCAD, SolidWorks, Blender, and others** have become an integral part of the learning environment. The subject of Engineering Graphics (Technical Drawing) not only develops traditional graphic skills but also cultivates a modern **design culture**. Therefore, developing the professional competence of future drawing teachers through **3D modeling technologies** is a highly relevant scientific and pedagogical issue.

3D modeling technologies contribute to the development of each professional competency. For

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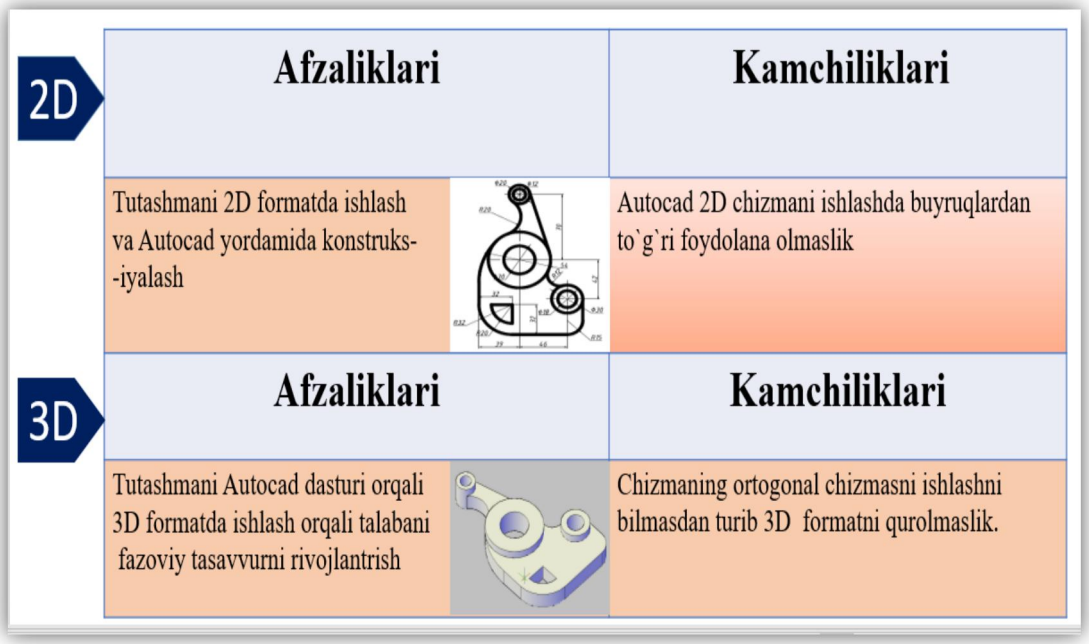
instance, by transforming 2D drawings into 3D models, students learn to perceive real objects spatially and understand their structure more effectively.

2.



Stages of the Methodology for Using 3D Modeling

1. **Theoretical Preparation Stage** – reinforcement of knowledge on graphical projections, geometric modeling, and technical drawing principles.
2. **Practical Training Stage** – modeling of parts and mechanisms in 3D software and performing real engineering assignments.
3. **Integration Stage** – connecting 3D technologies with other subjects (such as technology, architecture, design, and mechanics) through project-based learning.
4. **Innovative Project Stage** – students independently develop 3D design projects and present them using presentation tools or virtual reality technologies.

3. Didactic Advantages of the Methodology

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- Develops students' **spatial and technical thinking**.
- Integrates **traditional 2D drafting** with **realistic 3D visual modeling**.
- Encourages **independent learning**, **creativity**, and **innovative activity**.
- Makes the learning process **interactive, engaging, and motivating**.

4. Creative Approaches

- **Virtual Laboratories:** analyzing complex parts and mechanisms using virtual reality technologies.
- **Project-Based Learning:** organizing teamwork among students to design and develop 3D projects collaboratively.

Conclusion

In conclusion, the methodology of using 3D modeling technologies in the development of **professional competence** among future drawing teachers has proven to be highly effective. This approach not only enhances **graphic literacy** but also develops **creative thinking**, **technical reasoning**, and **digital literacy**. As a result, the educational process becomes more **digitalized, interactive, and practice-oriented**, preparing students to become **competitive specialists** in the modern labor market.

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