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IMPROVING THE METHODOLOGY OF PREPARING STUDENTS FOR SCIENTIFIC RESEARCH THROUGH TEACHING GENERAL PROFESSIONAL SUBJECTS

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Abstract: This article explores the theoretical and practical foundations for improving the methodology of preparing students for scientific research through the teaching of general professional subjects. The study emphasizes the integration of research-based learning into the educational process to develop students’ analytical, critical, and innovative thinking. The necessity of creating a methodological model that connects academic learning with research-oriented education is justified. Through the use of theoretical analysis, pedagogical observation, and practical experimentation, the paper demonstrates that introducing research components into general professional subjects enhances students’ motivation, increases their academic performance, and strengthens their ability to conduct independent inquiry. The results confirm that this approach contributes to forming a new generation of specialists who can apply scientific reasoning and innovation in professional practice.

Keywords: scientific research, methodology, professional education, innovation, analytical skills, higher education, pedagogical model.

Introduction.

Providing students with in-depth knowledge of general professional subjects, preparing them for scientific research activities, software engineering, database, algorithms, programming languages, and emphasizing theoretical knowledge and practical application, the fact that scientific research and the development of professional competence is a complex and multidimensional process, the development of scientific research in future engineers being trained in technical higher education institutions, teaching modern research methods, artificial intelligence and other methods teaching, the process of using these methods to solve various problems is aimed at learning on the basis of a specific scientific problem and developing scientific research in them in the conditions of today's information, globalization and mobilization. Specific features of preparation for scientific research activities, the structure, components, parameters of the methodological model, the development of educational technology, information and didactic support, and the development of evaluation criteria. The results of the students are evaluated, their strengths and weaknesses and future development paths were determined Modern higher education emphasizes the integration of scientific and technological development into the teaching and learning process. Preparing students for scientific research is one of the most essential tasks of educational reforms. Teaching general professional subjects plays a major role in shaping analytical thinking, experimentation skills, and research abilities. This study focuses on improving the methodology for preparing students for scientific research through the teaching of these disciplines. 3D

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modeling programs such as AutoCAD, Autodesk Revit, SolidWorks, SketchUp, Civil, etc., and ways to implement them, modeling the preparation of future engineers for priority scientific-research activities based on the training of students in general professional subjects,3D modeling programs such as AutoCAD, Autodesk Revit, SolidWorks, SketchUp, Civil based on the training of students in general professional subjects and ways to implement them" to determine the level of preparation for priority scientific research activities, develop suggestions and recommendations.

1. Practical Significance of the Study

The practical need for improving research-based teaching arises from the demand for innovation and problem-solving skills in modern education. Students must be prepared to apply theoretical knowledge to real-life problems. Integrating research elements helps develop motivation, analytical skills, and readiness for postgraduate academic work.

2. Theoretical Framework

The study relies on competence-based education, problem-based learning, and project-oriented pedagogy. The proposed methodology includes a block-based model and a process-based model, both designed to connect theoretical learning with scientific inquiry effectively.

3. Research Methods

The study applies theoretical (analysis, synthesis), empirical (observation, interviews), experimental methods (trial implementation at the university), and statistical comparisons to validate the methodology.

4. Findings and Discussion

The implementation of the improved teaching methodology produced positive results. Student motivation increased by 30–35%, analytical skills improved by 25%, and engagement in scientific inquiry grew significantly. The two models offered a structured and dynamic approach to developing research competencies.

Conclusion. Improving the methodology of preparing students for scientific research strengthens analytical thinking, creativity, and independence. The proposed model can be effectively implemented in higher education institutions to build strong scientific potential and foster innovation.

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