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Research Article

EDUCATION OF FUTURE ENGINEERS IN THE PROCESS OF TEACHING GENERAL PROFESSIONAL SUBJECTS

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ABSTRACT

The article examines the issue of developing production and technological competencies among future engineers in the process of teaching general professional subjects. The significance of these competencies for the successful professional activities of engineers is explored and methods and approaches to their formation in the educational process are analyzed. The main emphasis of the article is on the role of general professional subjects in the formation of production and technological competencies. The various methods and approaches used by teachers to enhance students' learning activities and develop their skills and abilities necessary to work in the engineering field are described.

KEYWORDS

Formation, production and technological competencies, future engineers, teaching, general professional subjects.

INTRODUCTION

Training future engineers is an important task for educational institutions. An engineering course may include a wide range of subjects such as mathematics, physics, chemistry, engineering graphics, computer modeling, etc.

Important aspects of training future engineers are practical skills and experience with real projects. Students should be able to apply their knowledge and skills in practice, solving specific technical problems. One option is to conduct

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laboratory work and project assignments that allow students to apply their knowledge to real-life situations.

It is also important to develop students' creative thinking and ability to innovate. Engineering is constantly evolving, and future engineers must be prepared for change and new challenges. Engineering education should promote the development of critical and analytical thinking, as well as the ability to explore and push the boundaries of science and technology.

It is also important to take into account modern requirements and trends in engineering. For example, new areas such as energy efficiency, sustainable construction and robotics have been developing in recent years. The training of future engineers should be aimed at mastering and developing these new technologies and trends.

Engineering education should be comprehensive and in-depth to prepare students for various fields of engineering. Along with technical knowledge and skills, students should gain skills in communication, project management and teamwork, as these are important skills for a successful career in engineering.

To summarize, the education of future engineers should be practical, creative, focused on the latest technologies and have a comprehensive approach to prepare students for real-life challenges and challenges in the field of engineering.

General professional subjects, which are usually included in the educational program of engineers, play an important role in the formation and development of professional skills and knowledge. Some of these may be specialized, depending on a particular engineering field, but there are also a number of subjects that are common to all engineering specialties and are of particular importance. Here are some examples of such items and their significance:

1. Mathematics: This subject is the basis for understanding the fundamental principles and methods of engineering. Knowledge of mathematics allows engineers to analyze and solve complex technical and scientific problems, as well as develop new mathematical models and algorithms.
2. Physics: The study of physics helps to understand the basic laws and principles of nature that underlie engineering. Engineers equipped with knowledge of physics can more effectively and accurately evaluate and model the behavior of systems and processes, and predict the outcomes of engineering decisions.
3. Control Theory: This subject studies methods and tools for managing and controlling technical systems. Knowledge of control theory helps engineers design and develop automatic control systems and optimize their performance to achieve specified goals.
4. Engineering Mechanics: The study of engineering mechanics allows engineers to analyze and predict the behavior of solids and structures under the influence of external forces. This is important for the design of safe and reliable engineering solutions, as well as

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for taking into account the dynamics and interactions of components in the system.

5. Engineering Graphics: This subject teaches engineers the techniques of visualization and communication through graphical means. Knowledge of engineering graphics allows you to create technical drawings, diagrams and diagrams, as well as communicate effectively with other professionals and clients.

These and other general professional subjects play an important role in the formation of professional thinking, the development of analytical and technical skills, as well as the ability of engineers to solve complex problems and develop innovative technologies and solutions.

The formation of production and technological competencies is one of the main tasks of teaching general professional subjects. These competencies include the ability to apply industrial and technological knowledge and skills to solve practical problems.

In the process of teaching general professional subjects, the following methods and approaches can be used:

1. Practical classes and laboratory work. They allow students to put their acquired knowledge and skills into practice. For example, students can create projects, study and analyze production processes and technologies, and perform various practical tasks.
2. Project work. Students are invited to complete a project related to the production and technological aspects of their specialty. This allows them to apply the acquired knowledge and skills in practice, develop independence and creative thinking.
3. Case method. Students study various cases and analyze real production situations. They analyze the causes of problems and suggest ways to solve them based on their knowledge and experience.
4. Interaction with specialists from real production. This may include the inclusion of invited specialists in the teaching process, the organization of excursions and internships at enterprises, as well as the participation of students in real production projects.
5. Use of modern technologies. Professional subjects can be taught using modern technologies, such as computer programs, virtual and augmented realities, 3D modeling and others. This allows students to become familiar with real-life engineering problems and develop their manufacturing and technological competencies.

Overall, it is important to create an educational environment that allows students to actively apply their knowledge and skills, as well as develop practical thinking and the ability to solve industrial and technological problems. This will help them become qualified engineers in the future.

Thus, the process of developing production and technological competencies among future engineers in the process of teaching general

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professional subjects is an important and integral element of their training.

Teaching general professional subjects allows students to gain the necessary knowledge and skills that they can apply in their future professional activities. However, in order for this knowledge and skills to be useful and applicable in practice, it is necessary to pay special attention to the formation of production and technological competencies.

The formation of production and technological competencies involves the development in students of the ability to analyze and solve practical problems, the ability to work with various technical means and technologies, as well as the effective use of acquired knowledge and skills to achieve their goals.

In the process of teaching general professional subjects, it is necessary to use various methods and approaches that will allow students to actively participate in the educational process. This could be work in groups, project activities, practical exercises, etc. This approach will allow students not only to gain theoretical knowledge, but also to apply it in practice.

Thus, the formation of production and technological competencies of future engineers in the process of teaching general professional subjects is an important and integral element of their training. This allows students to gain the necessary knowledge and skills that they can successfully apply in their future professional activities.

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