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TECHNOLOGICAL COMPETENCIES OF FUTURE ENGINEERS IN THE PROCESS OF TEACHING GENERAL PROFESSIONAL SUBJECTS

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ABSTRACT: This article describes the issues of developing professional competencies of future engineers in the process of studying at a university. Contains a description of the specifics of the professional activity of an engineer. Because of this, an urgent theoretical and applied task of the modern educational space and teaching methods in universities is the problem of introducing a competency-based approach into the educational process, determining the psychological, pedagogical, didactic and methodological conditions for the effectiveness of this process.

KEYWORDS: Formation of competencies, competence, professional competencies, engineering education, general professional disciplines, special disciplines.

INTRODUCTION

New requirements in modern conditions are imposed on engineering education on the basis of a competency-based approach, which presupposes the focus of the educational process on mastering general cultural, professional, general professional competencies laid down in state educational standards that ensure the successful implementation of the professional activities of an engineer in a broad social, cultural, and economic context. The work of a modern engineer is complex and multifaceted.

One of the main goals of higher engineering education today is to prepare a competent engineer. The quality of education of specialists and the level of their professional competence have acquired particular relevance in modern conditions. “The competence of specialists is understood not only as their professional qualification characteristics – knowledge, skills and abilities, but also their professional and personal characteristics – human behavioral reactions in various work situations” [4, p. 27]. From the perspective of acmeology, the following general and mandatory “characteristics of professional competence” are identified for all specialists: gnostic (cognitive) – reflects the presence of the necessary professional knowledge (their volume and level are the main characteristics of competence); regulatory – allows you to use existing professional knowledge to solve professional problems; reflexive-status - gives the right to act in a certain way due to the recognition of authority; normative – reflects the terms of reference, the scope of professional competence; communicative determines the possibility of establishing contacts of various types for the implementation of practical activities” [1, p. 109]. When studying at a technical university, a student develops different competencies at different stages of educational

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activity. For example, in the first semesters, students study general scientific disciplines such as physics, chemistry, philosophy, history, foreign language. While studying these disciplines they are forming learning and independent work skills. Students learn to work in a team, tolerant of general social and national differences between people. Study use the basics of acquired knowledge in various fields of activity. Students develop the ability for self-organization and self-education, the ability to correctly express their own thoughts in oral and written speech when communicating with people and for solving assigned tasks and goals.

At the next stage, the study of general professional disciplines begins, in particular, materials science, engineering graphics, metrology, and the fundamentals of design and construction. Students acquire the ability to apply fundamental laws in the disciplines of natural sciences in their professional activities, the ability to use methods of mathematical analysis and modeling, theoretical and experimental research. Students begin to master the basic methods and means of receiving, content and processing information. They have the ability to solve simple problems in the professional field of their activity on the basis of information and bibliographic culture using information and communication technologies and taking into account the basic requirements of information security. They begin to understand the basic property and purpose of information in the development processes of the modern world.

At the last stage of study at the university, special disciplines are taught. After studying them, students can take part in activities to compile scientific reports on the work done and in the introduction of the research results obtained to the desired professional field. They may also be able to participate in working on innovative projects using basic methods research practice. Students acquire the ability to perform initial economic and technical justification of design solutions, ability to perform patent research to ensure patent purity new design solutions, the ability to apply methods for quality control of objects and products in the field of professional activity, analyze possible causes of violations of technological processes and prepare measures to prevent them [2].

The following characteristics of the “formation process” can be distinguished readiness for engineering activities: orientation of content and forms educational process of the university to prepare an engineer capable of going beyond limits of regulatory activity and carry out innovative processes; active focus on the process of developing professional readiness engineer to advanced domestic and foreign experience; humanistic focus of engineer training; bringing the engineer training process to technological level" [3, p. 38-39].

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