

PEDAGOGICAL ASPECTS OF PREPARING FUTURE ENGINEERS FOR PROFESSIONAL ACTIVITY

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Abstract: This article talks about the pedagogical aspects of the development of professional competence and preparation for professional activity in engineering, and shows concrete examples of its direct application. In this, the characteristics of the professional activity of an engineer and his training in a higher educational institution, the basic professional skills necessary for the successful implementation of engineering activities, and the personal characteristics of engineers are mentioned.

Keywords: competence, physics course, psychological-pedagogical, group, independent work, laboratory work, independent activity, ability, lecture.

Today, in connection with the increase in the scope of tasks solved by engineers, many changes are taking place in engineering activities in general, the content, goals and tasks of engineering work are changing and gaining new meaning. The tasks that engineers solve during their professional activities determine the engineering tasks that require certain qualities of graduates of higher education institutions. There are many works devoted to the study of the psychological and pedagogical aspects of engineering education: OV Seydametova, L. Sharipova considered the basics of training specialists in higher education, the characteristics of the engineer's professional activity and his higher education training in the institution, who paid attention to the psychological and

pedagogical aspects of the work of future engineers. Researcher ZFBeknozaroza developed a model based on didactic principles based on organizational-functional, independent activity of formation of professional competence in future engineers in the process of teaching physics, in which she paid special attention to the following:

1) from the cycle of natural sciences studied by future engineers, the general physics course was chosen for modeling as a subject with the greatest opportunities for the formation of all basic general professional competencies;

2) from all forms of lessons that can be conducted within the framework of this training course, practical training is selected as a pedagogical form that can include elements of lecture, laboratory work, group and independent work;

3) from all types of activities in the practical lesson, problem solving is chosen as the main activity that lasts up to 90% of the time allocated for the lesson.

As part of the research, we were interested in the abilities of students that can be formed and developed during the general physics course, lectures, practical and laboratory classes, because if the student has the necessary skills in the future, the quality of mastering special subjects as an engineer and we can talk about successful work. It is necessary to pay attention to the basic professional skills (ability to work independently; analytical, cognitive skills, ability to analyze, synthesize, generalize; mathematical skills) necessary for the successful implementation of engineering activities. For example, if we talk about mathematical ability, after solving an engineering problem at the level of acceptance of a certain concept, it is necessary to perform mathematical calculations.

Figure 1. Necessary abilities and personality traits for a future engineer to perform calculations.

Thus, about half of the personal characteristics required for an engineer can be formed in the study of fundamental sciences in elementary courses. Many specific skills can be matched with general skills that cannot be developed without them. In the first and second years of higher education, students from the period of studying the general physics course to create the full professional and important characteristics and qualities of the

person, and to create positive motivation for education and work, to form the ability of students to improve the quality of knowledge for independent work, special subjects it can be concluded that the future engineer should use skills, abilities and competitiveness in the labor market.

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