

PHYSICAL-ENGINEERING PROBLEMS STAGES OF SOLUTION AND ITS DIDACTIVE TASKS

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Abstract

In this article, based on the comparison of the stages of solving physical and engineering problems in the preparation of engineers for professional activities, the features of the educational and methodological support of the general physics course and the features of the educational and methodological support in the educational process are presented.

Key words: physics course, competence, educational and methodological support, educational process, model, analysis, theoretical knowledge, independent work, individual, invariant.

Introduction

During the study of the general physics course, it is possible to compare the stages of solving problems in different subjects on the basis of the analysis of scientific and educational-methodical literature by developing educational-methodical support for solving physical and engineering problems.

Based on the comparison of the stages of solving physics and engineering problems, didactic tasks (general education/professionally oriented) of the educational and methodological support of the general physics course were developed. The structure of this task is shown in Figure 1.

The developed support performs the following tasks in the educational process:

1. Educational. From the point of view of the traditional approach: it helps to systematize and generalize the knowledge of the general physics course, it helps to solve the problems in education. From the point of view of professional direction, it helps students to generalize, distinguish the main ones, make reasonable decisions, learn to prove their point of view, helps to form the knowledge and functional components of the main general professional competences.
2. Controller. The level of mastering of theoretical knowledge and the ability to solve educational problems, as well as the levels of formation of basic general professional competences (as well as the analysis of mistakes made) allow the implementation of intermediate and final types of control.
3. Educational. From the point of view of the traditional approach: it activates the cognitive activity of students, encourages them to study the general physics course as a science and as

one of the foundations of future professional activity; from the point of view of a competent approach: forms the direction of activity in solving problem situations towards the result, helps to form the motivational component of the main general professional competencies.

4. Reflection. Traditional approach: learning to check the obtained result, finding the optimal way to solve the educational task, allows self-evaluation. Professionally oriented approach: forming the need to check the results of one's activity, finding an effective way to perform a professional task, a critical attitude towards oneself, helps to strive for self-development. Contributes to the formation of the reflexive component of basic professional competencies.

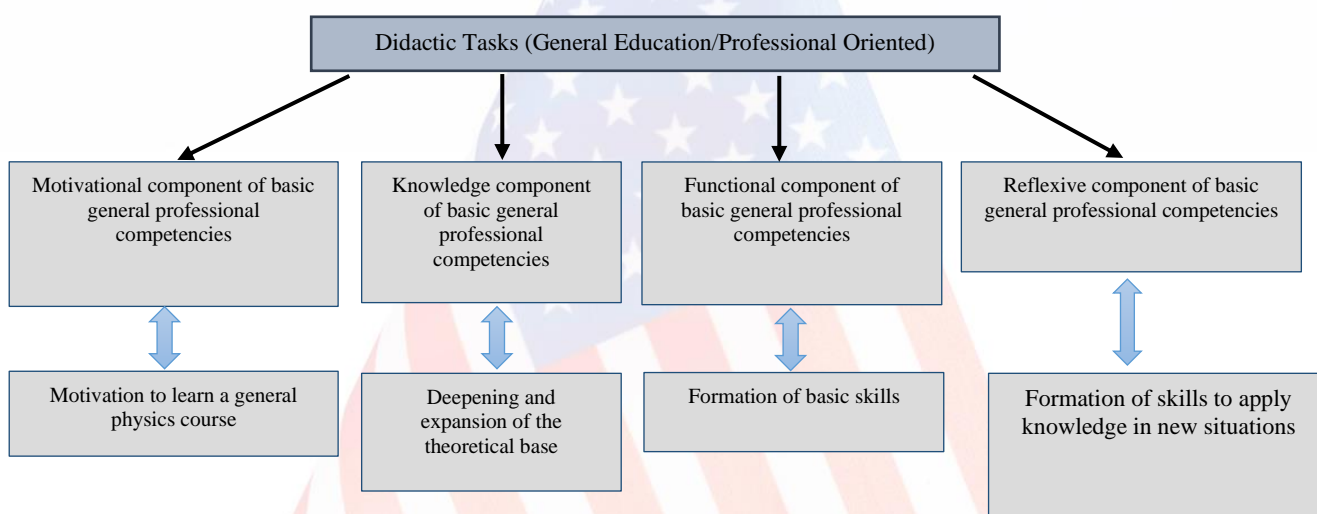


Figure 1. The structure of didactic tasks.

5. Individualization of the teaching of the general physics course and formation of the basis of professional competence due to the ability to use a large part of the educational and methodical training in the independent work of the students.

6. Optimizing the educational process due to the activation of cognitive activity and independent work of students.

In short, the systematic use of didactic tasks developed through the proposed educational and methodological support leads to an increase in motivation for studying general physics course, solving physics-engineering problems and independent work, helps to form the basic general professional competencies of future engineers.

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