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PEDAGOGICAL CHARACTERISTICS OF INDEPENDENT WORK AND ITS ROLE IN FORMING PROFESSIONAL COMPETENCES OF STUDENTS-ENGINEERS-ENGINEERS

Abstract: The main goal of this work of higher professional education is to prepare a competent specialist engineer who is active, ready for effective independent solution of professional problems in any conditions. Independent work as a form of organization of the educational process of higher professional education is normatively fixed in the federal state educational standard.

Key words: independent work, student, engineer, competence.

Language: English

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Introduction

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The increasing importance of the independent work of engineering students in the process of their professional training is proved not only by regulatory and legislative documents, but also by the growth of pedagogical research on this issue. Independent work as a form of organization of the educational process of higher professional education is normatively fixed in the federal state educational standard. This document defines the amount of time allotted for extracurricular work of engineering students in the amount of at least 50% of the study time, excluding classroom independent work. In this regard, the relevance of independent work as a form of education and the formation of readiness of engineering students for effective independent professional activity is a

modern problem that is not in doubt. Independent work is the main reserve for improving the quality of training of specialists. A modern graduate who is successful in the labor market must have general cultural and professional competencies, make decisions independently, bear responsibility for them, be able to independently determine the complexity of a professional task in any conditions. The personal qualities of the future specialist and professional competencies require a high level of independence of the graduate at the stage of training. Independent work in a university in this case is the most appropriate mechanism for the formation and development of independence as a personal quality and the form of the educational process that meets the stated goal of modern higher education. It is possible to cite the words of independent activity, backed up by knowledge, can become a genuine human heritage.

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This is precisely the dual nature of independent work - in personal and professional training. Independent work in its pedagogical sense is designed to solve many educational problems and tasks of personal development. The personal tasks solved in the process of independent work include: the formation and development of independent work skills. Consequently, independent work, as a form of the educational process, is designed to solve not only didactic tasks, but also general pedagogical and personal ones; to form and develop professional competencies, contribute to the development of the individual as a future specialist, professional.

In the pedagogical literature there are a sufficient number of different definitions of independent work. Meanwhile, at the level of definition of the concept of independent work, there are discrepancies. A retrospective analysis of the definitions of independent work accumulated in pedagogy allows us to highlight several reasons for determining this definition. For example, independent work means students completing assignments without any help, but under the supervision of a teacher. Defining independent work, identifies it with self-education. Individual search for knowledge - a general characteristic of the educational activities of a university student; that actually "in independent work, independent student preparation, taking place in parallel with the educational process of the university, is the process of self-education".

Combining the two processes, loses the specifics of the actual independent work. We agree that self-education, as "the most universal and flexible form of continuing education", has more significant tasks than the tasks of independent work of engineering students. The tasks of self-education go beyond the educational process at the university. Therefore, self-education differs from independent work not only in the form of assimilation, deepening and acquisition of new knowledge during the period of study at the university, but also in the form of continuing the education of young specialists after graduation." For example, professional self-education is the formation of special skills and the acquisition of subjective qualities. Consequently, independent work is part of a more significant process of self-education, acting as its means, method, mechanism, presenting a personal activity determining. Independent work should be called the students' activities that they perform, "showing maximum activity, creativity, independent judgment, initiative." Important in this definition is the emphasis on the activity of students in the leadership of the teacher. Thus, the grounds for determining independent work in this period were the degree of participation (leadership) of the teacher and the degree of independence of students. Despite various reasons in the definitions of Soviet scientists, nevertheless, based on the analyzed definitions, the following characteristic signs of independent work

can be distinguished: this is an essential component of the educational process;

□ this is a form of the educational process that can be carried out in an auditorial and extracurricular manner;

□ this is an independent cognitive vigorous activity of students without the direct guidance of a teacher;

□ this is an activity that is carried out independently under the leadership role of the teacher Gog, planning and monitoring its implementation. Let us dwell for comparison on some definitions of independent work in the interpretation of modern researchers. For example, the following definition is given: "The independent work of engineering students at a university is an internally motivated activity that involves the realization of its goal, including a certain personal meaning, the obligatory self-organization in time and space, the presence of self-control and the subordination of other interests and forms of employment to this task. In the definition of a researcher, a psychological approach is obvious, allowing you to turn to the personal qualities of students. By independent work in didactics, one understands the various types of educational activities of students (both individual and collective) in class and extra-curricular activities without the direct participation of the teacher, but according to his assignments. Consider the independent work of engineering students as part of a contextual approach. The basis of the effectiveness of independent work determines a steady educational and professional interest. On the whole, including independent work in the self-educational process aimed at forming the professional competence of a future specialist, nevertheless, does not exclude the managerial function of the teacher, but emphasizes the mandatory independence of engineering students in setting learning tasks, performing actions, evaluating their activities and their results." You can also actualizes the personal meaning in the organization of independent work, noting the leadership role of the teacher. Also emphasizes the role of a teacher. According to her definition, independent work is organized and planned by the teacher, but he does not directly participate in its implementation. The author also emphasizes that the planning and control of independent work, as an important part of the educational process, should be carried out not only by the teacher, but also by the departments, the educational department, and the methodological services of the educational organization. In its definition, it emphasizes the objective and subjective sides of this process, where a specific task proposed by students for independent fulfillment acts as the objective side of independent work.

At the same time, according to the author, the cognitive activity of engineering students, the realization of the need to acquire knowledge are

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subjective. It defines independent work "... as a complex and continuous type of educational activity of engineering students, which is carried out both in the classroom and during independent training." The author emphasizes the role of the pedagogical leadership of teachers in organizing independent work, as well as the importance of independent work itself, which allows us to deepen, comprehend, and systematize the material obtained; improve acquired skills. For effective independent work in the process of professional self-development, according to N.V.Smetanina, a flexible, focused leadership of the teacher, mastering the skills and effective methods of independent activity by students is necessary. This definition is probably more suitable for classroom independent work, since it notes the deepening and understanding of already acquired knowledge. In addition, in this definition, the connection between professional self-development and independent work is not clearly traced. Researchers in their work emphasize the possibility of independent work for classroom and extracurricular educational activities of engineering students. In addition, the author focuses on the possibilities and even the need for an individual approach to the organization of independent work, believing that this approach not only ensures the effectiveness of the result of independent work, but also contributes to the development of a student engineer. For these purposes, the author offers the variability, complexity of educational and training-professional tasks for independent work of engineering students. Therefore, in this definition, emphasis is placed on the content of educational tasks for independent work and the role of the learner is not emphasized. Defining the independent work of engineering students, on the contrary, emphasizes that it is free activity, the effectiveness of which is determined by self-control, reflection, focus, activity, self-organization on the part of engineering students.

Actually independent work is initiated by students from the position of "individual internal cognitive motives at the most convenient time from their point of view". Without claiming to be a complete analysis of the concept of independent work, four leading approaches in its definition can be distinguished. Independent work as a private type of activity, independently organized by virtue of individual motives of cognitive, personal, professional development, free in the choice of time, volume and means, self-controlled, mediated by the external management of the teacher. The subjective approach involves addressing individual determinants. The determinants include, first of all, self-regulation. In the context of self-regulation, a student engineer must be able to set goals for independent work, be able to design, plan the process of independent activity, determine the necessary conditions, and choose the means for its implementation. Definition of independent work from

the position of a personal-activity approach. In the framework of this approach, independent work is determined by the internal motivation of the subject, his focus on the development of educational material, the desire for results, the ability to plan and structure the volume and tasks of independent activity. Consequently, the effectiveness of independent work depends not only on the level of formed skills and abilities of independent activity, but also on the level of self-awareness, reflexivity, self-discipline, personal responsibility. Considering independent work as the subject of our research, one cannot help but pay attention to the very concept of "independent", which indicates the decisive role of personal efforts and the personal nature of activity, which is the meaning of subjectivity. In domestic pedagogy, psychology, and philosophy, the problem of subjectivity, of a person as a subject of his activity, has been repeatedly studied. It was these works that laid the foundation for the modern, personality-oriented educational paradigm. Therefore, in the methodology of independent work, a personality-oriented approach is absolutely justified. Also, the analysis of definitions allows us to highlight some of the components of independent work that occur in all definitions. Firstly, independent work is a managed (during the training period) type of independent educational activity that takes place before, during and after the organized educational process and is the driving force of the permanent process of self-education. Secondly, independent work is a process that depends on the managerial, leading role of the teacher. Thirdly, independent work, its effectiveness is determined by the personal qualities of engineering students (motivation, purposefulness, cognitive and activity, independence, self-regulation). Fourth, the effectiveness of the independent work of engineering students, its nature depends on the conditions of its organization. Such conditions may include the degree of teacher management, the nature of the content of tasks and tasks of independent work, the degree of security (information and technical base, methodological support, skills of independent activity of engineering students). Thus, in our study, under the independent work of engineering students, we understand the type of educational activity of engineering students, due to the personal motivation for the formation of professional competencies, the ability to choose the method of educational activity, managed and organized during the training period by the teacher's leadership role and the educational environment's pedagogical conditions. It becomes obvious that the independent work of engineering students is not a method or only a form of organization of the educational process, but appears to be a separate multilateral and multifunctional phenomenon that has educational, personal, professional, social potential and significance. According to I. A. Zimnyaya, independent work is the highest form of educational

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activity and, therefore, has priority in the professional education of engineering students. In the logic of our study, it is necessary to identify the structure and typology of independent work in order to determine the possibilities of independent work of engineering students to form professional competencies. This logic of reasoning will allow us to reach the pedagogical conditions for the effectiveness of independent work of engineering students in the formation of professional competencies. In the structure of independent work, relying on the analysis of definitions, we distinguish the following components from two positions: from the position of a teacher: planning, selection of educational tasks,

□ control, analysis, support.

Consequently, in order to organize effective independent work in a university, despite the fact that it is organized by departments, a training department, and methodological services, a set of additional pedagogical conditions is required. The effectiveness of independent work is determined by external factors (methodological, regulatory support, pedagogical conditions), internal factors (the formation of self-study skills of applicants; the formation of key competencies, motivational and cognitive activity of student engineers, the student's personal qualities that determine the individuality of the learning process).

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