AMERICAN JOURNALS
Open Access, Peer Reviewed Journals

American Journal of Pedagogical and Educational Research
ISSN (E): 2832-9791| Volume 35, |April - 2025

DESCRIPTION OF THE STAGES OF PREPARING STUDENTS FOR PRACTICAL ACTIVITIES IN ELECTRICAL ENGINEERING

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A B S T R A C T

In organizing electrical engineering education, it is important to clarify its goals and objectives, content, form, methods and means of education. If we divide the entire period of professional training in higher education institutions into three stages, then the motivational components of training are presented. This article examines the special aspects of the organization of students' practical training in the field of the concept of a conceptual model, which is a basic psychological concept that reveals various aspects of mental reflection in electrical engineering activities.

K E Y W O R D S

Education, pedagogical, information, technological, engineering, technology, psychology, model.

INTRODUCTION

Analysis of the development of society involves taking into account the near future changes in its production environment. Based on the implementation of environmental analysis, it is possible to consider priorities among educational methods. In the framework of our study, the main attention was paid to educational technology, since the main object of our research was the results of mastering the knowledge provided to students of technical specialties in higher education in electrical engineering. We identify the main distinguishing features of technologies. Education is the transfer of information from one person to another. Upbringing is the influence of one person on another in order to force the educated person to learn certain moral habits [1]. If we analyze these definitions, which are often found in pedagogical literature, then it is easy to see that upbringing acts as a special case of education, but only in the process of upbringing moral information is transmitted. This indicates that the meaning of these concepts is different. Upbringing reflects the process of socialization, which is carried out by an individual and a group in the form of a consistent and gradual assimilation of only a certain part, that is, socially formed norms, values, and methods of activity. Upbringing lays a solid foundation for a person's entire life, predetermines the choice of real goals, which is shown to be carried out not arbitrarily by a person, but under the pressure of objectively existing tendencies, depending on the real possibilities of its assimilation [2]. Here, differences are observed - moral information is not simply transmitted, but, unlike education, must be normative. The relationship between education and upbringing is realized due to the fact that the main tool of education and upbringing is the teaching process.

Literature review. Accepting that education is a technological process of information transfer that can be taken into account in future activities, we consider education as an act or a series of acts of transferring norms of behavior that should be mandatory for a specialist in a particular profession. For example, the normative concept of "it is impossible to put pressure on nature" should be mandatory for any engineer, since his main task is to create waste-free technologies, but this cannot be done through specially organized technologies. This, like other ethical norms that an engineer must adhere to, is determined by the level of pressure on the future engineer of the "right to education". The study shows that educational programs cannot be implemented without social technologies, that is, without technology that is inextricably linked with society, but we consider the stability of the ethical standardization of education to be more stable than the stability of the criteria for standardization of education. It is known that technical disciplines can change very quickly, even within a few years. Unfortunately, social characteristics are only vaguely taken into account in educational standards and programs. This situation is one of the main reasons for the decline in the level of higher education. Therefore, one of the main issues in the development of new programs is to take into account the ethical standards inherent in the specialists being trained on the basis of this educational program [3].

Research Methodology. It is difficult to discuss the problems of education in higher education institutions without taking into account the age characteristics of students. As is known, the main period of student life is usually divided into two: late adolescence - 15-21 years and early adulthood - 21-25 years [2]. During these years, not only intellectual capabilities, but also goals and views change radically. First of all, it is necessary to take into account the dynamics of self-assessment. The thoughts, values, and assessments of young people are flexible, have a relative, relativistic nature, and imply the possibility of significant changes even in basic ideas. Such moral flexibility, mental instability can lead to deviant behavior [3].

It is noted that at this age the probability of deviation from the norm is high, and the following are noted: disruption of the need-motivational sphere; decreased ability to adapt socially; It is especially noted as a special sensitivity to certain types of interactions that cause an inadequate response [2].

When considering the scientific fields of psychology and pedagogy within the framework of the educational process, they treat it as external and internal aspects of this process [2, 10-b]. If we divide the entire period of professional training in higher education institutions into three stages, then the motivational component of training gradually changes.

The first stage is characterized by high levels of professional and educational values, which act as motives governing educational activity. However, here the value relationships are abstract and idealized. They are determined by the inclusion of the social significance of professional and educational values, rather than their personal meaning, and do not form a coherent hierarchical system of motivation. As a result, students' value ideas about subjects are not related to their attitude to the profession and study, and their educational activity is guided only by direct educational motives.

At the second stage, the intensity of manifestation of all motivational-value factors decreases, the previously formed hierarchical structure is completely destroyed. Professional and educational values cease to govern educational activity, as a result of which educational activity and educational effectiveness decrease, and the subjective perception of difficulties in mastering the studied subjects increases. At this stage, two-thirds of students with low value attitudes are influenced by various factors in the organization of the educational process, including the quality of teaching. The main

internal factor regulating their educational activity is utilitarian motivation, which is manifested in a formal attitude to learning.

Analysis and results. The third stage is achieved in properly organized educational work and with the successful activation of students' interests. It is characterized by a fully conscious attitude to educational and professional values, which form a single integrated system of motivation, structured according to the level of generalization. Students' educational activities, with the formed value attitude towards academic subjects, continue on a more favorable motivational background. Students who have reached this state are more satisfied with their chosen profession and are oriented towards its meaningful and creative aspects [2].

The psychological theory of education consists of the laws of forming the psychological system of student activity. The goal of preparing a student for professional activity should be to form a system of psychological activity. Depending on the real conditions of professional activity, its psychological mechanisms can change significantly, which should be taken into account in the process of professional training. These statements are also true for engineering education. Therefore, in order to search for ways to improve the quality of engineering education, it seems important to determine the features of the formation of the psychological system of modern engineering activity [4].

As a psychological model of modern engineering professional activity, it is proposed to use the functional psychological system of activity, which is formed from the spiritual elements available in the student through their dynamic mobilization in accordance with the goals of professional training [5].

The psychological system of activity includes the following main functional blocks: motives of professional activity; goals of professional activity; activity programs; information base of activity; decision-making; subsystems of professional qualities. All blocks of the psychological system of activity are closely interconnected and are isolated for research purposes. The formation of each of the blocks occurs in the educational process and has its own characteristics for engineering education [5].

The personal needs of students determine the motives and goals of engineering professional activity, which are formed throughout the entire period of training. Students, motivated by motives and realizing the goals of activity, learn to act in accordance with the activity programs formed during the educational process. The activity program should be formed primarily as an internal mental model of the sequence of actions leading to the achievement of the set goal. The student should form a set of mental activity programs for standard professional situations in his engineering work, as well as the skills of making creative decisions in non-standard situations [4].

The concept of a conceptual model is the main psychological concept that reflects the information basis of activity and reveals various aspects of mental reflection in various types of activity, including engineering activity. A conceptual model is called an internal means of regulating activity, it includes all the life experience and knowledge that a person uses to solve professional problems [6]. A conceptual model is a set of possible methods and means of influencing an object, which are closely related to the content of mental images of real and predictable activity states, which allow a person to mentally imagine the image of the normal functioning of the object of activity and its possible deviations from the normal functioning [7].

From the point of view of cognitive psychology, the preparation of a modern engineer for the profession should be aimed at forming a conceptual model of future professional activity. A distinctive

feature of the conceptual model is that it includes not only the transmitted signals received at the current moment, but also the person's previous experience. It acts as a dynamic synthesis of existing information retrieved from memory [8].

When forming a conceptual model, it is also necessary to take into account the insufficient use of the human brain's capabilities to perceive, process and remember professionally important information. This is due to the need to spend nervous energy and mental effort on this process. Therefore, it is necessary to improve the ability of students to perceive and assimilate professionally important information, while minimizing the intellectual and mental forces required for this. The use of modern technologies for organizing the educational process makes this possible. However, the main thing is not just to convey professionally important information, but to understand its meaning and content. Thus, the technologies being studied should significantly increase the speed of perception, understanding and deep assimilation of a large amount of knowledge necessary for a modern engineer. We organize educational activities in several stages, which are as follows.

The first of them is the level of sensation and perception, which arises from the direct impact of objects and phenomena of objective activity on human analyzers.

The second is the level of imagination, that is, the level of visual images of objects and phenomena that do not affect the sense organs at the current moment, but did affect them in the past. This level is of great importance in the formation of a conceptual model.

The third is the level of speech and thinking processes. It is characterized by a generalized indirect reflection of reality. This level is formed by the student in the process of assimilating knowledge, as well as in the methods of generalization and abstraction, that is, in the methods of thinking in the process of decision-making.

The levels of information reflection in the mental system of activity are manifested in the form of sensory, perceptual and conceptual organization of information, which, in turn, reflect two classes of conceptual representations of information in the student's mind. The first of them includes "concepts whose signs correspond to the visual-imaginative properties of objects. These concepts are formed first in the process of cognitive activity and determine the unfolding and course of perceived knowledge. The second class includes "category concepts", the signs of which are associated with the reflection of functional relationships between primary concepts and objects" [9].

Conclusions and Recommendations. Researchers emphasize the formation of a system of interconnected concepts in the process of cognition for technical specialties. The future engineer helps to strengthen concepts in his thinking schemes by introducing any concept into a set of relationships, contributing to the emergence of additional associations. Each new concept introduced should be clearly defined and interconnected, its relationship to other concepts should be determined.

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