

PSYCHOLOGICAL AND PEDAGOGICAL FUNDAMENTALS OF STUDENTS' PHYSICS TRAINING OF CONSTRUCTION SPECIALTIES USING SOLVING PROBLEMS MEANS

Stages in student learning are determined by a combination of many factors and indicators. The development and implementation of pedagogical technologies based on the competence paradigm of vocational education ensures the action of three interdependent factors influencing the development of personality: motivational, value-volitional and content-activity components.

Successful formation and realization of the value-volitional component of students' educational and cognitive activities is ensured under the conditions of co-management, partnership, subject-subject relations. Then the tasks of formation of value orientations, aspiration to self-realization, creative potential of students are effectively solved.

In the process of observing the process of solving problems in physics, the teacher must gradually form the student as a strong-willed person. The methodological component of this process for the teacher is the ability to understand the complexity and multifaceted of the structure of value-volitional factors, take into account age, identify hereditary, acquired and growing abilities and opportunities, create the most favorable conditions for their development.

We believe that taking into account the personal, psychophysiological characteristics of students, the level of competencies - knowledge, skills, abilities, values in practice determine the individual cognitive trajectory and the process of forming professional qualities of the future construction specialist. Purpose, physiological and psychological readiness to learn, the desire to learn is a prerequisite for student learning activities.

Motivation in the physics teaching is the main motive force of his behavior and learning activities and occupies a leading place in the structure of personality, permeating all its structural formations: orientation, character, emotions, abilities, mental processes and more.

During our observations of the process of solving problems in physics, we found out the conditions that give rise to activities aimed at removing contradictions and difficulties.

There is a need of the subject of study in a particular activity, and the motive - the justification of the decision to meet or not to meet this need in this educational situation.

Summarizing the research of scientists, we have identified the following motives that are inherent in solving problems in physics:

- cognitive;
- professional;
- motivating;
- mercantile.

External motivation implies that the physical problem of a cognitive nature is solved in order to achieve goals not related to the knowledge of the object, as well as to achieve objective higher values. External motives are motives of material encouragement, personal benefits related to obtaining a diploma, fear of failure, motives of communication, prestige among students, etc., ie motives focused on values that lie outside of educational activities. In any case, the process of forming motives is influenced by personality traits. The fuller the awareness of one's own motivations and motives for cognitive activity, the more precise the goals that the subject wants to achieve, the stronger the learning and cognitive motivation will be.

Learning should be meaningful to the student. The use of various techniques and methods of teaching in the process of solving educational problems in the physics of construction should evoke positive emotions and natural curiosity, to ensure high expectations of results. In order for a student to be truly involved in active learning, it is necessary to provide a clear problem for him in physics, to motivate personal weight and inner receptivity of the process under consideration, and this is achieved by creating a contextual learning environment.

We believe that the motivation to study physics is the vector that should unite both subjects of the educational process in the course of professionally oriented learning, which aims to become a future specialist in construction. This goal is achievable in the case of a conscious focus on the aspirations of both the teacher of physics and students, but if their motives are opposite - we will have zero result.

The process of perceiving the content of the educational problem is to reflect in the student's mind the defining properties of physical phenomena that act on the senses. In addition to information from visual, auditory, tactile and other receptors, a significant role is played by direct sensory experience and basic knowledge of the student, as perception is a "recognition" of physical concepts and phenomena, systematization into separate groups known to the subject. Of course, effective perception presupposes the presence of motivation, concentration, independence of decision-making, and so on.

Comprehension and understanding is a psychological and pedagogical part of the problem mastering the content process, which reveals the logical connections between concepts, determines their place in the holistic structure of the physics section to which this type of problem belongs. In the course of comprehension, the analysis of connections and causal dependences is carried out, the attitude to the mastered educational material is formed. Gradually, this attitude grows into a belief, there is a need for confidence in the validity of the conclusions, it becomes real to make unexpected assumptions - educational discoveries in the process of solving problems.

The consolidation phase involves a generalized rethinking of the action course, analysis and synthesis of the solution of the problem in order to systematize knowledge.

Testing the practical significance of the problem-solving process is manifested in the application of experience gained in solving experimental problems, home observations and work.

In the context of the professional learning environment based on the use of physical problem mobilizes the activities of students of construction specialties through the impact on all channels of perception of the new - visual, auditory and motor, which begin to work in parallel and coordinated. In this case, the perception of educational material is based not on distracted, but on selective attention, better processed as a result of mental actions, more securely stored in memory and more quickly remembered in the future. Such selective attention is the basis of purposeful and effective professionally oriented teaching of physics to students of construction specialties.

Physics is a basic discipline in the educational process in the training of construction professionals. Professionally oriented teaching of physics in institutions of higher

education in construction should provide a deep relationship between the fundamental and professional components of training a future specialist, link the content component of physics with the peculiarities of construction professions in considering specific processes and phenomena. Therefore, one of the main means is the use of applied, professionally oriented tasks and questions, the solution of which requires students to actively search.

Professionally oriented teaching of physics on the basis of solving the system of educational problems should provide conditions for personality-oriented learning of students of construction specialties, to which we include:

- focus on preparing the student for the future profession, taking into account his cognitive characteristics, motives, inclination to study physics and other personal qualities;
- creating conditions for the development of value-volitional orientations, the separation of physics as the basis of scientific and technological progress, the formation of a professional position;
- formation of the need and readiness for personal self-improvement;
- focus on the development of students capable of their own learning activities in the context of a professional environment based on the teaching of physics and special disciplines;
- Orientation of educational material on the formulation and solution of problems in physics of professional orientation.

Improving the quality of knowledge of students of construction specialties in the process of professionally oriented teaching of physics should be provided by the implementation of personality-oriented content activities, which take into account interdisciplinary links in the content of professionally oriented problems. operating with different sources of information during their solution and finding ways to solve them in a non-standard way.