

# Theoretical Problems of Designing Pedagogical Technologies in Higher Education Institutions

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## Summary

The article discusses theoretical and methodological issues of modern pedagogical technologies: the essence, structure, functions, principles, conditions for successful functioning in educational process of the university. The article reflects the results of the analysis of publications on the following grounds: 1) levels of presentation of scientific information (theoretical, theoretical and experimental, empirical); 2) signs and properties of educational technologies; 3) approaches to the choice of grounds for classifications of educational technologies; 4) the possibilities of educational technologies in the formation of the academic, communicative and professional competence of a specialist; 5) criteria for assessing the effectiveness of their application in university educational practice; 6) the readiness of university teachers to develop and implement educational technologies.

## Key words:

*pedagogical design, modern educational technologies, ways of designing innovative pedagogical technologies*

## 1. Introduction

In the process of teaching and scientific research, knowledge, skills and abilities are formed, there is a comprehensive intellectual development of the personality of students and their worldview. All this happens through the main sphere - the mental activity of students: sensation, perception, ideas, comprehension, memorization and other mental processes. As a result of mental functioning, all this is analyzed, synthesized through the harmonious action of the higher nervous activity of a person. On the basis of this activity, a learning system is created that combines the content and form of scientific knowledge, establishing connections and relationships between objects and phenomena of the objective world.

The condition for constructing a theory of teaching in higher education is the interconnection of three formative principles:

1) the accumulation of experimental empirical material based on the assessment of the practice of the educational process, its typification, classification and grouping;

2) the establishment of empirical connections and elements that make up the educational process;

3) the formation of theoretical, generalized, objective relationships that make up the educational process, the identification of their causes and development.

The interrelation of these principles provides the theory of learning with a meaningful basis, sufficient scientific certainty and objectivity [2-5].

Learning, the educational process, mental activity and its development are concepts that are inseparable in essence and in form. This applies to the broadest concept of education, and to any specific fact of learning [1-3].

It is also very important that learning takes place in a directed, organized way. This means that the learning process itself as a process of mental development requires relying on the fundamental data of science about the functions and nature of thinking, relying on the physiology of higher nervous activity and psychology. That is, the theory of learning should be in the closest connection with the psychophysiology and psychology of learning. This requires teachers to turn to the active mental activity of students, influencing the development of their creative thinking work, a well-grounded psychological approach to each lesson and, which is especially important, the ability to model the student audience, to manage its cognitive activity.

The pedagogical meaning of the connection between the theory of teaching in higher education and the laws of psychophysiology and psychology is mainly in substantiating the ways of the all-round development of a creatively thinking and creatively acting personality of a highly qualified specialist.

The theoretical basis of the study was the works of foreign and domestic authors devoted to the analysis of learning in

educational institutions, including universities, in which the problems of effective training of students were solved on the basis of innovative approaches to the organization of the educational process [1-7].

## 2. Theoretical Consideration

This substantiation requires a preliminary consideration of some general, interconnected concepts of the doctrine of higher nervous activity and psychology. These concepts, first of all, include consciousness, thinking, mind and psyche.

Consciousness in psychophysiology is considered as a person's property to reflect reality in sensations, perceptions, ideas, ideas, judgments and concepts. Consciousness allows us to evaluate and establish the relationship of people with each other, the environment and improve it in the process of diverse activities. Human consciousness is largely individual and independent, it allows us to imagine, invent, generalize phenomena and events, make guesses and assumptions, etc. Human consciousness reflects the subjective image of the objective world in a certain creative representation.

Thinking is a property of the human brain, a specially organized matter, to reflect objective reality in concepts, judgments, images of generalized ideas. Thinking and its development are inextricably linked with work and the language of people. Thinking is characterized by such processes as analysis and synthesis, hypothetical search, abstraction, formulation of concepts and laws, proofs, inferences, modeling, etc. The concept of "mind" is actively associated with thinking - an active process of thinking that characterizes a deep understanding of the phenomena of the surrounding world, ways and forms of their development.

The psyche is a specific function of the human brain, which ensures its diverse adaptation to the changing conditions of the surrounding reality. Mental functions include handling sensations, perceptions, ideas, feelings and mental activity. The psyche, just like consciousness, expresses the subjective image of the objective world, the concept of the psyche is broader than the concepts of consciousness and thinking, since the psyche considers not only the conscious, but the sensory and subconscious.

In higher education, the most essential applied tasks of psychology are:

- psychological substantiation of the ways of acquiring knowledge and skills;
- organization and management of the processes of thinking and work;
- psychological substantiation of ways to improve teaching methods;
- substantiation of the characteristics of the age-related development of students;
- assessment of the mental properties of the student;
- identification and development of individual creative characteristics and inclinations of students;
- assessment of the mental and moral state of students.

Revealing the laws of the psychological theory of teaching in higher education is closely related to the consideration of the characteristics of the psychology of student age (on average 17-23 years). This is the heyday of the physical and mental development of a person. But blossoming is not yet ripeness. With the approach of maturity, there is a continuous increase in working capacity, dynamics of vigorous activity, productivity. At the same time, the moments of an increase in the dynamics of one function are replaced by moments of a decrease in other functions. At this age, the development of verbal intelligence, the dynamism of arousal is observed. The level of observation and the general culture of observation increases. The performance of actions, deeds prevails over their justification. This age is characterized by the manifestation of maximalism, the desire to express oneself as soon as possible in difficult life situations without a sufficiently deep assessment of the likely consequences of committed actions, egocentrism. There is an indifferent attitude to the experience of other people, advice, comments, instructions from elders are perceived as an unreasonable invasion of privacy. Characterized by the desire for independence, independence, passion for new (not always progressive). Along with self-confidence, there is a lack of confidence in their capabilities, which often manifests itself in swagger, negligence, negativism and even aggressiveness. At this age, the motives of camaraderie and friendly solidarity are very noticeable[8-10].

Along with curiosity, the desire for new things, the manifestation of interest in certain activities and areas of knowledge, there is denial and skepticism as a result of superficial views. The categorical opinion at this age can easily change, especially under the influence of "authoritative" friends.

The age of 17-23 years is the most fruitful for the formation of knowledge, scientific and professional development, improvement of a comprehensive thinking culture.

Along with age characteristics, the assessment of personality traits by temperament is of necessary interest.

Among students, as well as among people in general, they differ:

- choleric people (temperamental, active, sociable, energetic);
- sanguine people (excitable, persistent, active, balanced, sociable);
- melancholic (slow, withdrawn, prone to stable moods and states, shy, painfully sensitive, unsure of themselves);
- phlegmatic people (with the strongest, balanced type of character, unhurried, persistent, non-offended).

In relation to educational and scientific work, specific student types emerged: empiricists, analysts, rationalizers, logicians, performers, organizers, taxonomists, scholars, generators of ideas, romantics, imitators, and even thought interceptors.

It is essential to use psychological grounds for managing the cognitive activity of students, by organizing interests, motives, attitudes, active mental activity and the use of methods of reflexive influence.

**Motive, attitude, interests.** Interest in cognition arising on the basis of conscious motivation is of great importance for the educational process. Interest and motivation are inextricably linked with the physiological processes of higher nervous activity. From the standpoint of neurophysiology, the creation of interest and motivation is characterized by the emergence of a strong irritation focus in the cerebral cortex. That which interacts with him is included in temporary connections and is appropriately fixed.

The motivation of cognitive activity characterizes a person's attitude to a particular manifestation of reality and is associated with the emergence of a need for cognition. Interest is an expression of the directionality of a person's consciousness due to the presence of interconnected systems for reflecting reality. If such a connection exists, the process of cognition is carried out actively, if it is broken, then the interest in learning weakens, and then it can disappear altogether [9-13].

Interest and motives are the basis for the educational process on which knowledge, skills and practical experience of students arise, consolidate and develop. Motivation, interest, the need for knowledge - all these are necessary conditions for learning activities. Educational information is more actively perceived when students need to perceive it. The same content of the studied subject of the same degree of complexity, in the same volume, can be assimilated in different ways, depending on the way it is presented, the motives of perception and the interest of students [14-15].

The educational process is carried out more actively in those cases when it is associated with solving problems of problem situations, and the problems have a motivational basis, including a keen interest in the subject of study. Motives stimulate, organize, and direct learning activities. Of considerable interest is the motivation for organizing the learning process and directing the mental activity of students. It is of essential interest to find out what motives guide the cognitive activity of students, what they are based on. At the same time, it is of considerable interest to clarify the specific reasons for the manifestation of interest, motives and needs for study [16-20].

Modern neurophysiology and psychology consider it very important that a person always acts according to an attitude that arises as a result of external influence, which tunes him to obtain the expected result. Setting in teaching is a condition for organizing and directing mental activity and proceeds from the goals and objectives of teaching. When there is a clear setting based on the goals and motives of learning, then mental activity turns out to be concentrated, and the energy of this activity is concentrated, therefore, and the result of training in this case turns out to be more effective.

**Perception and understanding.** Psychology gives a significant place to such an important psychological quality for teaching, which is perception. Psychology considers

perception as a process of reflection in the human mind of objects and phenomena.

Very important for the learning process is the fact that the composition of perception includes speech activity, which determines the content of perception. Physiology of higher nervous activity considers perception as analytic - synthetic activity of the cerebral cortex, characterized by the fact that it is caused by the combined effect of the properties of objects and phenomena on the human sense organs. Therefore, perception is not just a series of sensations, but an integral image of an object as a model of a particular set of attributes of the object of perception.

Psychologically, each perception is considered as a synthesis of the sensations and representations included in it with its own specific structure and the allocation of the role and place of each component in this whole.

Perception processes are in close connection with representations, which psychology considers as reproduced images of perception. In contrast to perception, representations arise on the basis of memory, without the direct involvement of the senses. In the educational process, representations usually arise under the influence of directed mental activity, speech and the conventional language of science.

**Attention.** Psychology indicates the ways of revealing the most important property of thinking for learning - attention. Attention is the initial stage of understanding. When attention arises, a separation of the real and the imaginary occurs, suggestions and guesses arise. The organization of attention and observation is one of the main conditions for the success of training. If the teacher manages to attract the attention of students to the subject of study, then this means that he has achieved half of the success.

**Memory.** The educational process of higher education is closely connected with the rational use of the psychophysiological theory of memory. Psychology considers memory as a device of mental activity to preserve and reproduce what was in the mind. Memory, memorization and forgetting are in functional connection with the past content, experience, impressions and active mental activity of a person.

## Conclusions

The theory of teaching in higher education is inconceivable without addressing the continuity of its historical development and educational and cognitive activities, referring to the methods and means of teaching in their specific role, opportunities and ways of their development.

An essential indicator of the development of the educational process is the emergence of new, progressive ideas and tendencies for improvement: content, forms, means and methods of teaching, on the basis of which new theoretical propositions arise that provide justification and direction for optimal pedagogical actions.

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