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VIEWS ON THEORETICAL ISSUES OF DIVERGENT THINKING IN SCIENTIFIC RESEARCH

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ABSTRACT

In this article, on the basis of world experience, a scientific analysis of the research on divergent thinking in the modern education system is carried out.

KEYWORDS

Divergent, intellectual, concept, identification, attention, perception, association process, thinking, association, motive, activity, convergence, reproductive, creative thinking, independent, heuristic.

INTRODUCTION

In elucidating the scientific views on the essence of thinking, it seems important to briefly describe the views of some philosophers and to dwell on the history of the formation of this concept as an example. For example, according to Plato, thinking is a process of remembering [3; 228]. For Descartes, thinking is the only attribute of the soul, which determines the continuity of thought processes, the intellectual joy of knowledge [1; 208].

A comprehensive analysis of philosophical, psychological and pedagogical literature allows us to emphasize that the initial period of research of this concept is characterized by its real identification with

logic, and only conceptual and theoretical thinking is the only type that should be studied. The ability to think itself was considered innate, and therefore, as a rule, it was considered outside the problem of the development of the human psyche.

Forms and laws of thought are also the subject of consideration of logic in philosophy. We found out that from the point of view of this science, "thinking in a broad sense is a set of mental processes (attention, perception, process of associations, formation of concepts and judgments) that are the basis of cognition. More precisely, it involves the formation of

judgments and conclusions through the analysis and synthesis of concepts.

The explanatory dictionaries of the Uzbek language have the following definitions: "thinking is a person's ability to understand the content of reality events, connect them, compare them and draw conclusions from them; the process of such a comparison of events"; "Thinking is the property of a person to think, the ability to think" [4; 98].

At the moment, representatives of biology, medicine, genetics, cybernetics and a number of other sciences are also related to the research of thinking, expanding knowledge about human thinking and complementing each other. Each of these disciplines has its own questions, thanks to which they address the problems of thinking, their own system of concepts and, accordingly, their own theories of thinking. Sciences such as psychology and pedagogy make a great contribution to the idea of human thinking.

Let's consider the concept of thinking from the point of view of psychology. We analyzed the theories of thinking in Western psychology, which is as follows: in associative empirical psychology, thinking in all its forms is reduced to associations, the connection of traces of the past and impressions from current experience (H. Gartley, D. Priestley). Thinking activity, its creative nature, in our opinion, is the main problem that this theory could not solve. Therefore, its supporters assumed that mental creative abilities are a priori related to the innate abilities of the mind and not related. Therefore, supporters of the associative theory stopped considering thinking as a connection (association) of ideas.

A. Binet, F. Brentano, K. Bühler, E. Husserl, O. Seltz, representatives of the Würzburg school, in contrast to the subjectivism of associative psychology, put

forward a position on the subject orientation of thought and emphasized its importance. The importance of the theoretical conclusions of these school psychologists for our research is that they showed the orderly, directed nature of thinking and revealed the importance of the task in the thinking process.

From the point of view of psychoanalysis (3. Freud), the thinking of a person, which is an attribute of the mind ("I"), is under the influence of multidirectional influences: the unconscious ("it") and its real demands. the culture in which man lives ("super-I"). These circumstances dictate a certain function to thinking: to act as a process aimed at finding a way to realize unconscious aspirations, taking into account a specific socio-cultural situation. In other words, thinking works as a mechanism to control the actions necessary to achieve a goal.

According to D. Watson's hypothesis, both thought and speech are formed as a result of the same movement activity. The difference is that thought is an internal dialogue and speech is a thought spoken out loud. Behavioral psychologists present internal mental activity as a set of complex chains of internal speech abilities that are formed according to the "stimulus-response" scheme. The disadvantage of this theory of thinking is that thinking is always accompanied by action, although "thought is still richer than speech and is not always formed by words."

In the science of local psychology, based on the doctrine of the nature of human psyche, thinking is interpreted differently, it is understood as a special type of cognitive activity. By introducing the category of activity into the psychology of thinking, the contradiction between theoretical and practical intelligence, the subject and object of knowledge was eliminated. Thus, for our research, a new relationship

between activity and thinking, as well as between different types of thinking, has been opened, it is possible to raise and solve questions about the genesis of thinking, its formation and development in children. It's done. the result of targeted learning. In this regard, thinking in the theory of activity means the ability to solve various problems aimed at revealing its hidden aspects from direct observation and to change reality in accordance with the purpose.

Two aspects can be distinguished in S. L. Rubinstein's understanding of the concept of thinking as an activity. Firstly, to define thinking as a type of mediating activity, and secondly, according to the principle of determinism, to show that external causes act only through internal conditions in mental activity.

According to S. L. Rubinstein, mental activity is determined indirectly by the object, through its internal specific patterns (goals, motives). One or another external reason helps a person to solve a certain mental problem depending on the degree to which the internal conditions of his thinking are formed, in other words, how independently he advances in the analysis of the problem being solved. The mediating role of conditions affects all internal organizations (goals and motivation of thinking).

The analysis of modern scientific literature allows us to note that at this stage the following somewhat conditional classification of types of thinking was adopted and distributed on different bases: the genesis of development, the nature of the tasks being solved; location level, novelty and originality level, thinking tools, thinking functions were studied and analyzed.

Summarizing the above, we can say that when we talk about thinking in the future, we understand a special type of activity, the highest form of human creative

activity, which is associated with changing the subjective images, meaning and meaning of objects. is an icon. Like any activity, thinking is determined indirectly by the object, through internal specific patterns, goals, motives, and is used to solve real contradictions in the conditions of people's lives, to formulate new goals, to open new means and plans for achieving goals.

Studying the classification of thinking according to the proposed scientific basis led us to the idea of the need for a detailed analysis of the productive type of thinking (which occurs on the basis of creative imagination), which, in our opinion, brings us closer to understanding the essence of divergent thinking. We present this analysis in order to determine the characteristics of the phenomenon of divergence, and then have the basis for the study of the species concept - divergent thinking.

Divergence is a concept derived from the Latin divergence, and in modern dictionaries and encyclopedias it is interpreted as mathematical, biological or linguistic, etc. There is no general understanding of this phenomenon in modern science. For example, in the "Annotated Dictionary of the Russian Language" edited by S.I. Ozhegov, divergence is interpreted as a special scientific phenomenon and includes "a type (or types), a special quality, the characteristics of its activity, the existence and development of any type of object, the characteristic of an integral object that is divided or means ability.

Divergence and convergence processes occur endlessly in the process of biological evolution, anthropogenesis, ethnogenesis, social culture, human language and thinking, development of social life, development of knowledge, science, etc. in the subsequent history of scientific methods of thinking, specific mechanisms explaining the phenomena and

development of information are revealed, first of all, mathematics, formal logic, mechanics, biology, synergetics, etc.

Divergence is an important concept in classical mechanics and in that part of all physics called kinematics. It is interpreted as the presence and dynamics of objects, systems and network structures, as well as various flows in the form of fragmented changes that have extensions at one of the points, that is, division and co-creation in time. .

In the image of mathematicians (the term divergence was introduced by U. Clifford), the concept we are studying is the limit of the ratio of the flow of the vector field flowing through a closed surface surrounding a given point to the volume bounded by it [4; 120].

The emergence of the concept of "divergence" in biology belongs to Charles Darwin. From the point of view of this science, divergence is considered, first of all, as the differentiation of the characteristics and characteristics of previously related organisms in the process of evolution, which leads to the emergence of new characteristics and characteristics.

Analyzing the phenomenon of divergence, let's focus on the approximate scheme of communication and interaction of any type of objects consisting of three elements in general. All objects with different qualities and characteristics undergo internal development. Due to internal reasons and external conditions, at some point of unity and integrity, they come to be divided into parts, that is, another quality or aspect appears. This new quality is essence; at first simple separation, at least binary. In the second stage, this quality goes to the stage of simultaneous, parallel coexistence of new objects that already have their own characteristics. At this stage of development, these objects ensure their

sovereignty, independence, stability, a separate direction of changes, new intensity and adaptation to the environment. At the next stage, under favorable conditions, in the process of further change and development, these objects will approach. We note that the duration of the time intervals of divergence, convergence, and the presence of an intermediate unstable state (bifurcation) are different, except for special cases.

After studying the ideas about the phenomenon of divergence from the point of view of different disciplines, we consider it logical to move on to the analysis of the ideas of modern pedagogical and psychological concepts in order to understand the terms and their interaction: creative and divergent thinking.

The concept of creative, effective, creative thinking is the topic of our further study. We found that these terms have been used synonymously for a long time in educational psychology. Turning to the analysis of scientific literature, we set the task of determining how the largest representatives of psychological and pedagogical theories define the concept of "creative thinking", how they solve the issue of relations between the productive and reproductive components of mental activity.

The study of scientific sources showed that in any case when it comes to thinking, it is said about the emergence of the new, but the nature of this new is shown differently in different theories. In theories of reproductive thinking, "new" emerges as a result of complexity or recombination, mainly from the similarity of existing elements of past experience, the demands of the task, and the direct interaction between existing subjectively identical elements. implementation of dependency. Problem solving itself proceeds on the basis of mechanical trial and error,

followed by the identification of the correct solution found by chance or the renewal of a known system of previously established operations.

According to scientists, thinking cannot be effective without relying on past experience, and at the same time it involves going beyond it, discovering new knowledge. It is always the ability to solve new, more complex problems. In thinking, its productive and reproductive components are woven into a dialectical conflict unity, and their specific weight in a certain mental activity can be different. It should be noted that in the local scientific literature there are objections against the separation of certain types of thinking: productive and reproductive. At the same time, the majority of scientists who study thinking consider such a division to be appropriate. In the literature, these types (aspects, components) of mental activity are named differently. As synonyms of the concept of "product of thinking", it is expressed as: creative thinking, independent, heuristic, creative, divergent.

So, in our opinion, the main feature of creativity in divergent thinking is intellectual activity that combines two components: cognitive and motivational. However, in the context of the problem of the formation of divergent thinking, we consider it necessary to distinguish its personal side, which is unique in the development of adequate means of psychological-pedagogical influence on mental activity. Our opinion is structured as follows: if the personal-emotional aspect is related to the necessary conditions of the thinking process and prevails in setting the task accepted by the subject, then the personal-reflexive aspect prevails in the process of finding and discovering a clear solution. Existing attempts to control the thinking process by influencing value, motivational and emotional aspects do not lead to a significant increase in the effectiveness of problem

solving, and therefore cannot be the basis for the development of procedures for the formation of divergent thinking. In this case, cognitive and personal aspects of thinking and reflection, which ensures organic connection and penetration of a single functional area, will be more adequate. Constructive solution to the problem of formation of divergent thinking includes its inclusion in the content of the task and implementation of activities in a conditional problem situation. Therefore, in our opinion, it is appropriate to distinguish the third component - the personal-reflexive aspect of thinking in solving problems.

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