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15

MANAGEMENT OF LEARNING ACTIVITIES IN ACCORDANCE WITH ANALYTICAL AND HEURISTIC LOGIC

GESTIÓN DE LAS ACTIVIDADES DE APRENDIZAJE DE ACUERDO CON LÓGICA ANALÍTICA Y HEUSRÍSTICA

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ABSTRACT

The aim of this article is to analyze the educational reforms in the territory of the Caucasus during the tsarist occupation. The research analyzes the disparity of educational development in the various areas of the territory and its subsequent implications. In general, it was found that the Armenian ethnic group accepted the Russification process more quickly, while in the Muslim peoples this process was more complex. In this context, the training process in a new type of educational environment was enhanced by the creation of new types of secular schools and gymnasiums. The educational reforms constituted a positive impulse in the analyzed period, which contributed to the accelerated development of the region, although later it worsened the social crisis, because although the educational impulse was appreciated, the national identity of the peoples was never abandoned.

Keywords:

Educational activities, problem solution, motivation, intuition.

RESUMEN

El objetivo de este artículo es analizar las reformas educacionales en el territorio del Cáucaso durante la ocupación zarista. La investigación analiza la disparidad del desarrollo educacional en las diversas zonas del territorio y sus posteriores implicaciones. De manera general se encontró que la etnia armenia aceptó de forma más rápida el proceso de rusificación mientras que en los pueblos musulmanes este proceso fue más complejo. En este contexto, el proceso de formación en un nuevo tipo de entorno educativo fue potenciado por la creación de nuevos tipos de escuelas seculares y gimnasios. Las reformas educativas constituyeron un impulso positivo en el período analizado lo que contribuyó al desarrollo acelerado de la región, aunque posteriormente agudizó las crisis sociales, pues, aunque se apreció el impulso educativo, la identidad nacional de los pueblos nunca fue abandonada.

Palabras clave:

Actividades educacionales, resolución de problemas, motivación, intuición.

INTRODUCTION

According to Lorenzo &Gallon (2019), etymologically, the word pedagogy comes from the Greek παιδαγωγέω, a compound word that includes παῖς-παιδός, child, and ἄγω-ἀγωγός, leader, meaning the curator that guided a child's development and well-being during the first years of life. It has traditionally been defined as the discipline that deals with education concepts and teaching practices (Ellis, et al., 1991), or in more precise terms as the method and practice of teaching, especially as an academic subject or theoretical concept (Oxford University, 2021). It includes both theory (conceptual understandings of what is learning and knowledge, how humans learn, think, and interact) and practical approaches (who should teach, where, when, how, and what for) (Beetham & Sharpe, 2013).

"Education", "upbringing" and "training" are important concepts within pedagogy. Education is the discipline that is concerned with the methods of teaching and learning in schools or schools-alike environments as opposed to various non-formal and informal means of socialization (e.g., rural development projects and education through parent-child relationships). It can be thought as the transmission of the values and accumulated knowledge of a society (Swink, et al., 2021).

Taking this into account, training activities not only equip people with the knowledge, skills and habits necessary for various types of socially useful activities, but it also develops in a person the ability to manage their own psychological processes in order to select, organize and direct their work and operations, habits and experiences in relation to the problems to be solved. Thus, training fulfills the mission of enabling a person to engage in other necessary activities and, in general, in the formation of his independent personality as a creative person.

From the first days of its emergence, pedagogical psychology recognized this fact and studied the psychological problems of teaching in different directions. In educational psychology, the concept of "learning activities of students" was formed and established, and it is undeniable that in school practice, this concept has acquired a special relevance.

In the 60s and 70s of the past century, on the one hand, the establishment of a new pedagogical thinking, and on the other hand, the successes achieved in the field of the concept of activity, led to the emergence of the concept of "teaching activity" in pedagogical psychology.

A number of scientific sources have commented that although training is an important characteristic of educational activity, it does not cover all aspects of it. "Assimilation" and "learning activity" are essentially different events. Assimilation is an integral part of every learning process, not just the learning process. Educational activity is a type of activity, a unique form of social activity of the individual (Alizade, 2004).

Elkonin & Davydov (1966), and others in the "Concept of Teaching Activity" developed and distinguished the components of teaching activity such as a) teaching situation (or teaching tasks); b) teaching operations; c) control and d) assessment. The concept of these researchers, founders of the theory of formation of mental activity, differs from others in that these researchers do not connect the main aspect of the development of students' mental activity with teaching methods, but they see it in the content of acquired knowledge. The authors of the concept take the position of setting three important tasks for the modern school. These tasks include: a) the acquisition of a certain amount of knowledge; b) mental development; and c) creation of cognitive motives.

According to their subjective judgments, each of these tasks has its own solution and the solution of any of these tasks (problems, functions) does not lead to the solution of others but they can be solved only at the same time. The key to solving these tasks is to link the content of the knowledge to be mastered with adequate teaching methods. The authors of the concept believe that changing the content of education on the basis of the inclusion of the learning process creates a basis for addressing issues related to the development of mental development and cognitive motives (Elkonin & Davydov, 1966).

Other researches also show attempts to link teaching methods to learning objectives or levels of educational content. In this regard, I. Y. Lerner writes that "... teaching has four goals expressed in pedagogical language. These also correspond to the four elements of culture. Since the content of education can be determined only by the content of culture, it must consist of those types of content knowledge, skills and habits, creative experience and the norm of emotional education aimed at the system of wealth inherent in society (Mehdizade, 1982).

Because of this some authors rightly try to draw the attention of the pedagogical community to the fact that if the learning process is included in the content of education, then it is necessary to look at the content of training in a broader sense. In such an approach, the activity has a broader meaning and includes not only knowledge, skills and habits, but also motivation, assessment and other aspects of training. From our subjective point of view, it should be emphasized that the structure and content of

the activity is not unambiguously understood in didactics or other fields of science. According to the "psychological theory of action", in general, the activity is reduced to the activity of the person, interpreted as its attribute, i.e. perceived as an indicator of the subject's activity. From this point of view, education is seen as a system of interchangeable activities, and it is concluded that "in this case, the activity itself is divided into components."

Psychological and methodological approaches suggest that the role of activity in the content of education can feed all levels of the didactic system, from the content and purpose of education to learners' self-awareness and self-esteem based on its results. Unfortunately, the main aspect of the work of practical educators, as a rule, is the teaching of certain program material and the existing subject teaching methods have always guided teachers to this. Although advanced Methodists and teachers have paid some attention to the formation of teaching operations, self-monitoring and self-assessment skills in students, this has not been systematic. Therefore, in this paper, the approach to the inclusion of the learning process in the content of education is chosen to approach teaching as an educational technology, to act as a subject of analytical and heuristic logic in the process in which the learner enters. The relevance of the topic is supported by its possibilities in aiming at optimizing the learning process.

DEVELOPMENT

In the methodological approach based on the ideas of Hegel and Marx (developed by G.P. Shedrovsky), the carrier of the activity is not considered an individual, the activity itself is perceived as a substance (the substance that forms the basis of all things and events), repeated and reproduced under the influence of the learner (Mehrabov, 2010). Because of this, the inclusion of the learning process in the content of education requires the transformation of the learner into a subject of educational activity, which serves as an opportunity in the learning situation, in other words, to solve a cognitive problem of a specific nature (conditioning the production of a new one). Thanks to their research, psychologists have found that human creative mental activity can be of two types: analytical and heuristic. Analytical and heuristic types of creative thinking can be related to the introduction of new information into the existing system of knowledge and its processing in solving problems, including educational activities. The division is important not only to facilitate the selection and application of mental operations in solving the problem, but also to direct the practical activities of the educator in order to create pedagogical conditions for the implementation of individual mental operations. Depending on the content of the problem and other factors type (logic) is given (Ibrahimov, 1998).

The analytical type of mental activity is related to the exact sequence of mental actions during the solution of the problem and the existing solution algorithm. Mental operations such as analysis and synthesis, generalization, abstraction and concretization follow each other, in a certain sequence, step by step, to achieve a step-by-step solution to the problem. When the right rules are chosen correctly, the algorithmic logic of thinking sooner or later leads to a solution.

Jerome Bruner tried to reveal the specifics of the difference between intuitive thinking and analytical thinking in psychology. By comparing analytical and intuitive thinking, he showed that analytical thinking is characterized by the fact that its individual elements are clearly imagined; it is possible to express it in speech. In this case, a person can understand the course and content of thought, and the mind can accept judgment in the form of a transition from "general to specific" and "from specific to general." Intuitive thinking underlies the heuristic type of mental activity. In practice, the student's intuition manifests itself in a quick grasp of the idea. Intuition in the learning process is both imagination, creative imagination, quick conclusions and common sense and it is conditioned by a rich life experience.

Russian researcher Pushkin (1965), writes that the contradiction between the requirements and conditions of different activities is often encountered in life. Man has to solve diverse problems, but the given condition does not give grounds to reveal the method of solving them; sometimes in his past experience there is no solution scheme. To get out of this situation a person needs to create a new strategy of action, which is not in his life experience. This situation is called a mental process to a "problem situation". The problem-solving process is called productive thinking or heuristic action. Regarding that Pushkin (1965), sees the essence of heuristic activity in the following: a) it is an activity that is used to solve non-typical problems; b) there are receptions that are formed in the process of solving the problem and can be consciously transferred to other issues.

The structure of the analytical type of mental activity is as follows: 1) perception of difficulty and analysis of the problem situation; 2) identification of the main difficulty; 3) application of known algorithms or search for a solution by analytical methods; 4) check the solution and its accuracy. The structure of the heuristic type of mental activity is fundamentally different. Its individual stages are similar to those of the analytical type, but they are also specific.

The structure of the heuristic type of mental activity is as follows: 1) perception of difficulty and analysis of the problem situation; 2) identification of the main difficulty and formula of the problem; 3) a) search and development of solutions by making assumptions (development of a new algorithm) or b) making hypotheses and finding solutions in an intuitive way; 4) check the validity of the hypothesis by applying the obtained result in practice. Undoubtedly, the second way improves the practice of managing the development of the learner's mental abilities, the process of teaching activities (Ibrahimov, 1998).

As can be seen, the starting point of an intellectual process based on both analytical and heuristic logic is a problematic situation. It is undeniable that *"when a person needs to understand something, he begins to think. Thinking usually starts with a problem and a question, a surprise, a doubt, a contrast… through a problem situation, a person is involved in the process of thinking"* (Rubinstein, 1946, p. 347). At the heart of this situation there is a dialectical contradiction, that is, a "problem situation" is a contradiction between the knowledge of the requirements of practical and theoretical activities of people, the ignorance of the ways and means of carrying out this activity (Rakitov, 1977).

In contrast to scientific research, the problem situation in the learning process (teaching activities when the content of education includes the learning process) arises from the need to perform teaching tasks, which are necessary for the theoretical or practical implementation of the task. The mental state of the learner in this process characterizes the problem situation. The starting point of the learner's intellectual activity, which is aimed at meeting the need to redefine the task, is directly related to the problem situation. A. M Matyushkin writes that the problem situation, first of all, is not a training task, it is characterized by the mental state of the student and it occurs during the training task. In this regard, A. Nurushov also notes that the problem is a perceived difficulty that requires a search for a solution to the situation. A problem situation arises only when the difficulty is perceived, that is, when the learner accepts it for solution (Ibrahimov, 1998).

From our point of view, the following three goals are pursued in creating a cognitive need through a problem situation, which is realized by satisfying that need: 1) to teach new knowledge, as well as to apply the acquired knowledge in the new, unfamiliar situation; 2) to acquire knowledge qualitatively in the conditions of creative application; 3) to form a culture of students' use of scientific methods in accordance with their age and level of knowledge. It should not be forgotten that the problem arising from the analysis of the problem situation is in itself a psychological-didactic category, but also a problem that acts as a psychological-didactic category (a form of transition from old knowledge to new knowledge by resolving relevant contradictions). It carries new methods (both process and result) and determines the structure of the process of perception (the process of intellectual activity).

It is well known that we have to use the term motivation when investigating the causes and mechanisms of purposeful human behavior. The analysis of relevant materials obtained from scientific sources shows that motivation has been studied and is being studied in different directions in different psychological schools. The interaction of the elements that make up the structure of the field of motivation determines the effectiveness of educational activities. Motivation includes: needs; the meaning of training; motives; purpose; emotions and feelings. Needs are a unique condition that expresses a person's dependence on a particular life situation and determines his activity in this situation. Needs have a hierarchical structure and are dynamic. As a person's field of activity and communication expands, they change, new, higher needs are formed and developed on the basis of any satisfied need. The need for learning also arises in this process and creates conditions for students' learning activities as a special mental state. Cognitive needs develop into learning (and creativity) needs as they develop in the learning process (Alizade, 2004).

Distinguishing between the objective and subjective significance of things provides a basis for a psychological analysis of the motives of the individual. A. N. Leontiev not only expressed the importance of things for the subject with the term "personal meaning", but also put forward the idea that it directly reflects and keeps alive the pure life relations of the subject. Alizadeh (2004), showed that due to the formation of personal meaning, a new function is added to the two main functions of motivation (motivation and direction), which belong only to man meaning.

The meaning of training characterizes the attitude of the student to the educational activity by the dimensions of personality. Training should be subjectively important for the student. The student must "understand" the importance of learning for himself, not only with the logic of the mind, but also with the logic of the senses. The direction of the student's activity in teaching is determined by learning motives. The specific direction of the learner's activity in teaching is determined by his purpose. The goal is the "vector of educational activity."

Educational activities need to teach students how to set goals and achieve them. The learner must clearly define his/her goal, choose the most effective one from several

goals, the sequence of achieving it, the opportunities and time, possible difficulties and ways to overcome them (in fact, the emphasis forms the logic of action-mental activity).

It is clear that the optimal formulation of the problem is not an immediate and direct process. There are two phases in the problem statement process: 1) to "see" the problem in order to reveal it; and 2) to identify the problem in the question itself. The philosophical literature also shows that any problem consists of a "central question" and queries grouped around it. There are questions before and after the formulation of the central question. The first describes the process of finding the problem, and the second describes the process of solving the problem.

Of course, the formulation of the problem by the educator and the learner depends to a large extent on its complexity and the depth of its content. The problem arises at the beginning of the learner (or rather in the "cognitive apparatus") as a result of a complete analysis of the situation. The solution itself is a stage of educational-cognitive activity, which is considered to be one of the complex elements of problem-based learning and consists of several sub-stages.

Both the logic of solving the training problem and its solution scheme show the need to develop a solution process plan. But also the solution to the problem includes the selection among possible solutions in order to find the best one. Authors who study the importance of plans in human intellectual activity distinguish two types of plans: systematic and heuristic plans.

Systematic plans are identified with algorithms. Although problem-solving guarantees success, people do not always use systematic planning in their search for a solution. This plan requires a single action, in other words, the same set of actions, and sometimes takes a long time. An alternative to this type of solution, which is often effective, is the heuristic search method. A heuristic solution, as a rule, begins with a hypothesis. Many educators believe that if a student makes a hypothesis, he has already put forward a hypothesis, although such an assumption does not fit the nature of the concept. The hypothesis is a reasonable assumption and in teaching activity is a psychopedagogical category. It acts as a means of managing the intellectual activity of the learner, and a principle of solving the problem of learning.

For a comprehensive training, students should be able to distinguish between "primary" and "secondary" in the training material. Proof is the ability to find key facts and techniques in a learning material to test the validity of a hypothesis. It is important to develop these skills by organizing students' systematic activities to make hypotheses, analyze facts, and prove them. Here, the functions of the educator must be evaluated. In the process of proving the hypothesis, these functions include: 1) informing students about the facts necessary for analysis and judgment; 2) directing their opinion to analysis, comparison and conclusions; 3) to motivate students to make correct judgments, substantiation of hypotheses and research of facts. It is important that every student, be it analytical or heuristic, be able to regulate learning, look back, formulate a problem more clearly, and identify a more rational solution. In particular, it is useful to analyze mistakes, to correct the whole process of development of thought.

CONCLUSIONS

Intellectual processes have a special place in the structure of teaching operations. In this regard, the educated person, in the true sense of the word, becomes the subject of his activity. The judgments debated draw attention to the search in terms of the development of methods of teaching subjects, and the way to refer to analytical and heuristic logic as an option for students to become the subject of their own activities. This should be considered as a service to the understanding of the concept of educational activity and the enrichment of theoretical knowledge related to the formation of educational activity. The practical significance of this analysis is due to the fact that the practical pedagogue shows the way to the correct use of management functions (especially facilitation, incitement, etc.) in the transformation of the student into a subject of educational activity.

REFERENCES

Alizade, A. A. (2004). ***Psychological problems of modern Azerbaijani school***. Pedagogy.

Beetham, H., & Sharpe, R. (2013). ***Rethinking Pedagogy for a Digital Age: Designing for 21st Century Learning***. Routledge.

Elkonin, D. B., & Davydov, V. V. (1966). ***Age possibilities of knowledge acquisition***. Education.

Ellis, A. K., Cogan, J. J., & Howey, K. R. (1991). ***Introduction to the Foundations of Education***. Prentice Hall.

Ibrahimov, F. N. (1998). ***Essays on the basics of optimal ratios of algorithmic and heuristic activity in training***. Translator.

Lorenzo, N., & Gallon, R. (2019). Smart Pedagogy for Smart Learning. In, L. Daniela (Ed.), ***Didactics of Smart Pedagogy: Smart Pedagogy for Technology Enhanced Learning*** (pp. 41-69). Springer.

Mehdizade, M. M. (1982). ***Ways to improve the educational process in secondary schools***. Education.

Mehrabov, A. O. (2010). ***Conceptual problems of modern education***. Translator.

Oxford University. (2021). ***Pedagogy***. Oxford University Press. from https://www.lexico.com/definition/pedagogy

Pushkin, V. N. (1965). On the concept of heuristic activity in cybernetics and psychology ***Questions of Psychology, 2***(3), 34-39.

Rakitov, A. I. (1977). ***Philosophical problems of science***. Mysl.

Rubinstein, S. L. (1946). ***Fundamentals of general psychology***. State Study Pedagogical Publishing House of the Ministry of Education of Russian Soviet Federative Socialist Republic.

Swink, R. L., Huq, M. S., Shimahara, N., Gelpi, E., Szyliowicz, J. S., Graham, H. F., Moumouni, A., Browning, R., Thomas, R. M., Riché, P., Vázquez, J. Z., Anweiler, O., Mukerji, S. N., Chen, T. H. E., Naka, A., Bowen, J., Arnove, R. F., Lauwerys, J. A., Meyer, A. E., Nakosteen, M. K., Lawson, R. F., Chambliss, J. J., Scanlon, D. G., Marrou, H.-I., & Ipfling, H.-J. (2021). ***Education***. Encyclopedia Britannica. https://www.britannica.com/topic/education