

TRANSFORMATION OF EDUCATIONAL ACTIVITIES OF EDUCATORS AND LEARNERS IN THE PROCESS OF IMPLEMENTING "EDUCATION 4.0"

Ibrahimov F.

Sheki Branch of the Azerbaijan State University of Pedagogical professor,

<https://orcid.org/0000-0002-0775-10>

Ibrahimova S.

Honored Teacher, Sheki Branch of the Azerbaijan State University of Pedagogical
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Abstract

The article focuses on the continuous and gradual development of the civilization process in accordance with the calls of the industrial revolutions, the formation of adequate bases and superstructures, the main features of the "Techno-democratic-information society" that exists in the modern era, which currently makes people stronger, the education system that is formed adequately to these features, the concepts that reveal its nature, among which the concept of "teaching activity" is given a laconic scientific commentary. It is stated that teaching activity is one of the most important elements of the process of implementing education, understood as a system, this element has an important "enabling function" in the efficiency of the system in question. It is emphasized that in the process of implementing education, "interest → action → a new qualitative state of the party involved in the process (the student) to the desired level of development, education and upbringing" determines the management vector. In the research work, teaching activity is perceived as a type of personality activity, a specific form of social activity, and the essence and functions of the components (teaching situation, teaching operations, control, evaluation) included in its structure are clarified; the interpretation of the transformation (dialectics) of the aforementioned components into the sides of the unit in the organization and management of the joint teaching activity of the student and the teacher, as components of the educational implementation process, and their enabling functions are given.

Keywords: Base and superstructure; education; teaching activity; teaching situation; task; opportunity; action; cognitive operations; measurement and evaluation.

Relevance of the research topic: It is known that educational activity includes creative acts that exist between the educator and the learners in the process of implementing education, this type of activity has a complex structure, and the effectiveness (quality level) of the implementation of the educational process is determined by the transformation of the educational activities of the learner and the educator into parts of a unit. The regulation (facilitation) of the emphasized state in the process of implementing education directly depends on the understanding of the essence of the concept of educational activity. Therefore, we claim the relevance of conducting research on the topic "Transformation of educational activities of the educator and learners in the process of implementing Education 4.0".

Methodological basis of the research: In the process of conducting the research, L. Bertalanfi's "Idea of System Analysis" [7; 104-108] was used (the idea, which is interpreted as an attempt to study the properties of an object based on the properties of its parts - italics are ours - F.I., SI) The "System-structural approach", which has been formed as an important branch of dialectics and has risen to the level of its alternative, empirical, empirical-theoretical and theoretical methods of scientific cognition, the internal relationships of the forms of scientific cognition, and various pedagogical and psychological research generalizations were used as a methodological basis.

Interpretation of research generalizations: As is known, the process of civilization has been continuously formed in response to the calls of the "Industrial Revolutions", systems of socio-economic relations have been established on the basis of

dialectical conditioning of one another (logical expectation), and superstructures based on the aforementioned bases have been formed. Currently, there is such a system-basis as the "Techno-democratic-information society", which makes a person stronger, the implementation of information services at a sufficiently high level is a specific feature of the society in question. The information society, unlike the industrial society, is a more intellectual society and creates conditions for the highly educated, skilled, determined, and comprehensive development of people. According to our subjective understanding, members of the "Techno-democratic-information society" are characterized by information culture (this is the knowledge, intellectual skills and habits necessary for a person to adapt to the information society) and technological literacy (this is the ability of people to use various digital technologies, analyze information and operate safely in a digital environment. The development of digital skills is essential to ensure their safe and effective interaction with digital technologies in the future [9; 78-94].

A comprehensive and integrated approach of education systems is necessary to support the development of the skills of all learners to be active and ethical users of digital technologies [12; 57-79]. Digital education allows people to participate independently in social life. In addition, the reality of digital education and the digital revolution requires fundamental changes in the forms and methods of moral education, leading to the transformation of digital skills into the most important skills [11; 58-64]. There is no doubt that the development of digital skills of learners will lead to

their more active participation in society as digital citizens in the future [10], [12; 57-79]. This skill is not limited to using a computer and the Internet, but also: 1) Observing digital safety and cybersecurity rules; 2) Working with artificial intelligence and automation; 3) Digital analytics and data processing skills; 4) Using cloud technologies; 5) Includes rapid adaptation to new technologies), otherwise they will not be able to assert themselves as active and creative members of the society in question.

Due to the rapid development of technology, the knowledge and skills that students acquire during their education become obsolete by the time they graduate. In order to help develop and shape the use of today's fastest-growing technologies in scientific and technical education, it is necessary to train students and prepare them for the digital environment. Adapting to a rapidly changing environment will make it necessary for students to stay in touch with educational institutions even after graduation, providing both workers with updated skills and young students (and faculty) with a new direction related to the rapidly changing realities of the industrial and corporate sectors [13; 25-30], [14; 579-592].

Education, which is a process of sharing human experience, has been formed on a basis that includes the characteristics of industrial revolutions in stages as a product of social practice. According to our subjective understanding, it is appropriate to formulate the aforementioned sharing process as "the process of mastering systematized knowledge, skills and habits in accordance with the nature of the state, society and individual and its result" [5; 260]. "General education", which is an important stage of the education system, has taken its place on the superstructure of the basis formed on the basis of the calls of the IV industrial revolution and has become a "system formulated as a student-centered "SS" in general education schools".

It is worth emphasizing that this system is open to the application of the theories of "Multiple Intelligences" (Howard Gardner), "Stages of Intellectual Development" (Jean Piaget), "Social Development" (Lev Vygotsky), "Thinking Styles" (Carol Dweck), "Spiritual Development" (Lawrence Kohlberg), "Conditions of Learning" (Robert Gagne), and "Emotional Intelligence" (Daniel Goleman).

The establishment of a new pedagogical mindset and the successes achieved in the field of the concept of activity have led to the emergence of many concepts related to education, which can be interpreted with the concepts of "value", "process", "result", "system", and a change in views on it. Among the aforementioned concepts, the concept of "teaching activity" has also taken its place.

Teaching activity is one of the most important elements of the process of implementing education, understood as a system; this element has an important "enabling function" in the effectiveness of the system in question.

By the way, let's clarify the concept of "enabling function." In doing so, we argue that the concept of "teaching activity" includes the creative activity that exists between the educator and the learners in the process of implementing education.

It is known that something cannot come from nothing, and the new can only arise from certain preconditions, the essence of which is laid in the bosom of the old. The potential existence of the new is precisely the possibility. The possibility arises in the existing reality and is realized, embodied in the new reality. Being hidden tendencies expressing various directions in the development of an object, possibilities characterize reality in terms of its future. Dialectics assumes that development does not consist in expanding the set of ready possibilities, but in the process of the constant emergence of possibilities within the framework of reality and their transformation into a new reality. The process of realization of possibilities, their transformation into reality is possible thanks to activity and communication. Possibility does not mean action in itself. It is absurd to talk about a new quality if there is no idea that causes action. By "idea" we understand an idea that has risen to a high degree of objectivity, completeness and concreteness and is at the same time directed towards practical implementation [6; 16-17]. As a variation of one of the interesting ideas of ancient Greek philosophers, we should say that the teacher affirms himself when he has the opportunity for action that conditions his creative pursuits. From his mixed and vague ideas, clear pedagogical thinking emerges. Here it is appropriate to say that the idea that causes action is a vital being that creates a new model of development.

It is worth drawing attention to the very relevant analysis of Professor R.F. Mustafayev on the internal unity of possibility, action and personality. He rightly emphasizes that the concept of "possibility" plays a special role in our thinking and is in a certain sense equivalent to our existence, our everyday life. Being acquires essence when it has the possibility of action. The latter is impossible without deep creative searches. Where there is possibility, this means action. In turn, this creates a dialectical unity between particles and the whole. The idea that creates action is a vital being that forms a new model of development [4; 88].

It is undeniable that interest is always an opportunity. It is interest that drives opportunity. Interest can be transformed by the inner world of the personality and acquire value in its actions. Personality is always an opportunity. In our opinion, in the process of implementing education, "interest-action determines the management vector of the desired level of development, education and upbringing of the party involved in the process". In this process, the "choice" factor is of particular importance. At least the algorithmic and heuristic activity ratios are related to choice. In the process of implementing education, "opportunities", not "probabilities", correspond to the function of belonging. →→

In our opinion, we can talk about the "specificity function" by referring to Lutfizadeh's idea, which allows modeling human thoughts, finding methods in various options, and implementing accepted decisions. Determining what is most consistent with the specificity functions in the process of implementing

education actually means revealing the essence of this process.

Let us emphasize that “teaching activity” is multifaceted. Although training is an important characteristic of teaching activity, it does not cover all its aspects. Training, in the broad sense of the word, involves the acquisition of new knowledge, skills and habits. However, acquisition and teaching activity are essentially different phenomena. Acquisition is not only the learning process, but also an integral part of every field of activity, for example, play or work. Teaching activity is a type of activity, a specific form of social activity of the individual [2;150].

The concept of educational activity (D.Velkonin, V.V.Davydov, etc.) distinguishes the following components in the structure of educational activity: 1) educational situation; 2) educational operations; 3) control; 4) assessment (evaluation). Educational activity is a type of activity, a specific form of social activity of the individual [15].

Educational activity is a type of activity of both the teacher and the student in the “S-S” (“subject” “subject”) system, which is absurd to imagine these types of activity without assessment. The joint activity of the educator and the students in the pedagogical process begins to be realized with the transformation of the goal set by the educator into the goal of the student [7; 130-134]. In other words, when the part of human experience, adequate to the purpose of its presentation by the educator, which should become the subject of education, developed on scientific-pedagogical grounds and systematized, becomes the object of satisfaction of its cognitive needs, the event of the implementation of education in one form or another - the joint creative activity of the student and the educator begins, the students are ready to accept the educational task of the educator [8; 289-290].

Educational activity begins with the solution of educational tasks. The question is: “What do they mean when they say educational tasks?” Although its essence is reflected in the meaning of the task, its character is connected with the meaning of “educational”. Educational tasks are distinguished from any scientific, military, sports, etc. tasks by one important feature. Educational tasks involve the discovery and mastering of educational-general solution methods (principles, regularities) by students (students).

By presenting teaching tasks, the teacher places students in a unique teaching situation: in this situation, they become familiar with the content of general methods for solving teaching tasks, taking into account all specific and concrete options, and acquire the appropriate knowledge, skills, and habits.

By the way, let us note that the meaning of knowledge (information) includes the following: certain facts, terminology; methods of selecting facts; conceptual symbols; development trends; classification; criteria for verification and evaluation; research methods applied in a relevant field or problem; general concepts, structures and theories; principles and regularities necessary to explain and interpret phenomena and foresee their future development; knowledge of theories and structures [4;152].

Educational tasks have many unique characteristics, but one thing is clear: to solve them, students must master the necessary educational operations.

Teaching operations are diverse. Many of them are of a general nature and are used almost equally in the mastering of various teaching materials. Some teaching operations are more specific for the mastering of certain teaching materials (mathematical, linguistic, etc.). They also distinguish teaching operations applied in special cases. Intellectual processes - analysis, composition, comparison, generalization, etc. are always carried out by applying them to the content of a certain subject (mathematics, grammar, etc.) and therefore appear in the form of various subject operations (for example, mathematical). From this point of view, the formation of teaching operations is directly related to the acquisition of mental activity by students.

As a side note, J. Guilford distinguished 120 intellectual abilities in the structure of intelligence (“SOI”). Analyzing experimental materials, he came to the conclusion that intellectual abilities differ from each other according to three parameters: 1) the nature of intellectual operations; 2) the content of intellectual processes and 3) the products of intellectual activity. J. Guilford distinguished 5 operations, 4 types of content and 6 types of products of intellectual activity and considered them separately as factors. Thus, in J. Guilford’s model, 120 intellectual abilities are characterized by 15 (5+4+6) factors. Of the three parameters distinguished in the “SOI” model, the first (the nature of intellectual operations) is of greater importance. The second and third parameters can be explained precisely on its basis. J. Guilford distinguished the following according to the nature of mental operations: cognition, memory, divergent productive thinking, convergent productive thinking, and evaluation (evaluative thinking) [2;43-44].

The structural analysis of the intellect has shown that its core is thought. This provision had a special scientific and methodological significance for the concept of developmental education. In order to develop students intellectually, it is necessary, first of all, to develop thinking in them. In this process, it was necessary to take into account the genetic and functional interaction of thinking with emotions and perception, on the one hand, and with memory, and finally, with imagination, on the other. In the structural model of J. Guilford, thinking was systematically considered, its genetic and functional connections with various cognitive processes were explained.

By the way, let us also emphasize that the formation of learning operations in learners is a major requirement of modern times. The successful implementation of the principles of developmental learning depends, first of all, on the solution of this issue (for more information, see: [1]).

Control also plays a significant role in the formation of educational activity. The effectiveness of the activity is directly related to the level of control, as well as to the educational operations. From this point of view, it seems that two aspects should be noted separately: 1) The student compares the educational operations he performs and their results with the purpose of his activity, identifies and eliminates his own mistakes. It is necessary to always draw the attention of students

to this aspect - the results of educational operations, teach them to mentally plan educational operations, primarily to carry them out internally and analyze their results. When analyzing metacognitive functions, Flavell distinguished two aspects in terms of control: in the first case, the student controls himself by organizing his attention, and in the second case, he controls the problem-solving process (problems are solved through cognitive issues). Both functions are of particular importance in educational activity. 2) When control is effective, the student's educational activity is carried out as a manifestation of his will: he makes efforts to overcome the difficulties encountered, shows special activity for the implementation of the goal, and the direction of his activity is already conditioned by mediated interest. In this situation, control gradually turns into self-control, begins to develop effectively on the basis of reflection. Control is directly related to assessment, which is of great importance as a unique component of educational activity. The question may be asked: "What is the difference between assessment and control?" When examining educational activity from this point of view, it is necessary to distinguish its two sides - the final result and the methods of achieving the result.

In the control process, more attention is paid to the extent to which these methods are effective and adequate. In other words, in the control process, the results of individual teaching operations are examined, not the final result of teaching activities. However, in the assessment process, the final result of teaching activities is analyzed, and its compliance with the purpose of teaching activities is determined. The assessment situation is characterized by psychologically complex features. In this situation, more than the assessment itself, perhaps the aspects that emphasize the teacher's attitude to the student with emotional shades play a special role. When assessment is psychologically effective, it gradually turns into self-assessment, playing an important role in the formation of the student's self-awareness. It creates radical changes in the dynamics of the student's level of assertion in the field of assessment. It creates qualitatively new features in his learning motivation. Psychologically favorable conditions are created for the actualization of cognitive interests in teaching activities.

During the monitoring and evaluation of pedagogical processes and events, the activities of learners and educators, one often encounters the problem of measuring one or another quality indicator. Therefore, the question "Is it possible to measure the quality indicators of processes in numbers?" worries many specialists. In this regard, the American scientist J. Morrissey showed that the most difficult problem is to overcome the emotional opinions of people working in the field of management about the quantitative assessment of quality, such as "there are no accurate and reliable methods for quantitative assessment of creative work", and to monitor the solution of this problem and develop new approaches to their solution [3;38].

To solve these and similar problems, first of all, it is necessary to get acquainted in some detail with the concepts of "measurement", "measurement scale". Measurement is the implementation of appropriate algorithmic operations to express the observed states of

an object (process, event) with appropriate signs (unit, number or symbol). As a result of measurement, information about the studied object is obtained, in other words, the state of the studied object is assessed. Depending on the purpose of measurement (evaluation), such rules for measurement are selected and determined that allow assessing the main properties of the object. Each such rule requires determining its own "measurement scale". Currently, the following measurement scales and their modifications accepted by specialists are used: named (nominal) scale; ranked (degree) scale; interval scale; ratio scale; absolute scale [3;39].

Scientific novelty and practical significance of the research. 1. A specific (laconic) scientific explanation of the main features of the "Techno-democratic-information society" that makes a person stronger at the current stage of civilization development is given to the education system, to the concepts that reveal its nature, among which the concept of "educational activity"; 2. The attention of educational theorists and practitioners has been drawn to the fact that educational activity includes creative acts existing between the educator and the students in the process of implementing education, and that the efficiency (quality level) of the implementation of the educational process is determined by the transformation of the educational activities of the student and the educator into the parties of the unit; The direct dependence of the correct regulation of the emphasized state in the process of implementing education on the understanding of the essence of the concept of educational activity has been emphasized; 3. The interpretation of the educational activities of the student and the educator as parties of the unit will greatly facilitate the work of the educator in terms of the systematic selection of creative acts existing between them in the real pedagogical process (in the process of implementing education).

Result. 1. Educational activity is one of the most important elements of the process of implementing education, understood as a system (as well as a process, result, value), this element has an important "enabling function" in the effectiveness of the system in question; 2. In the process of implementing education, "interest → action → a new qualitative state of the desired level of development, education and upbringing of the party involved in the process" determines the management "vector", which plays the main role in the organization and management of the joint activity of the educational activity (its components - educational situation; educational operations; control; assessment (value)) as a component of the educational implementation process, transforming the unit into parties (dialectics), and directing the enabling functions.

References:

1. Abbasov, A. N., Mammadzade, R. R., & Mammadli, L. A. (2021). *Pedaqogika: Ünsiyyat (Ali təhsil müəssisələri üçün dərslik)* [Pedagogy: Communication (Textbook for higher education institutions)]. Mütərcim.
2. Alizadeh, A. E. (2004). *Müasir Azərbaycan məktəbinin psixoloji problemləri* [Psychological problems of the modern Azerbaijani school]. Pedagogy.

3. Mardanov, M. C., Aghamaliyev, R. A., Mehrabov, A. O., & Gardashov, T. B. (2003). *Təhsil sistemində monitoring və qiymətləndirmə* [Monitoring and evaluation in the education system]. Chasioglu.
4. Mustafayev, R. F. (2000). *Düşüncə azaddır* [Thought is free]. [Publisher Unknown].
5. Ibrahimov, F. N., & Huseynzade, R. L. (2014). *Pedagogika (Dərslək)* [Pedagogy (Textbook)] (Vol. 1). Mütərcim.
6. Ibrahimov, F. N. (2002). *Tədris prosesi: imkan-fəaliyyət-yeni keyfiyyət* [Educational process: opportunity-action-new quality]. Mütərcim.
7. Ibrahimov, F. N. (1998). *Təlimdə alqoritmik və evristik fəaliyyətlərin optimal nisbətlərinin əsaslarına dair öçerklər (monoqrafiya)* [Essays on the basics of optimal ratios of algorithmic and heuristic activity in training (monograph)]. Mütərcim.
8. Feyziyev, J. A., Ibrahimov, F. N., & Bediyev, S. R. (2011). *Didaktika (Dərslək)* [Didactics (Textbook)]. Mütərcim.
9. Hristian, K. (2019). Challenges and opportunities for education in the Fourth Industrial Revolution. *African Journal of Public Affairs*, 11(3), 78–94.
10. Sari, L., & Arif, S. (2019). The roles of digital literacy, technology literacy, and human literacy to encourage work readiness of accounting education students in the Fourth Industrial Revolution era. In *Proceedings of the International Conference on Economics, Education, Business and Accounting*. KnE Social Sciences.
11. Priya, S. (2019). Digital Revolution of Education 4.0. *International Journal of Engineering and Advanced Technology (IJEAT)*, 9(2), 58–64.
12. Mascheroni, G., & Olafsson, K. (2016). The mobile internet: Access, use, opportunities and divides among European children. *New Media & Society*, 18(8), 57–79.
13. Ercan, Ö. (2018). Development of new directions in education and Education 4.0. *University Research Magazine*, 1(1), 25–30.
14. Li, L. (2020). Education supply chain in the era of Industry 4.0. *Systems Research and Behavioral Science*, 37(4), 579–592.
15. Elkonin, D. V. (1996). *Vozrastnye vozmozhnosti usvoeniya znaniy* [Age-related possibilities of assimilation of knowledge]. Prosveshchenie