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The Activity-Based Approach to Achieving Theoretical and Practical Consensus in Pedagogy of N. F. Talyzina

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ABSTRACT

The relevance of the problem under study is based on the necessity to solve the permanent problem of the unity of theory and practice in the content of students' cognitive activity in the modern conditions. The purpose of the article is to analyze and to generalize the main concepts of pedagogy by N.F. Talyzina for implementation of the activity-based approach as a productive means of achieving theoretical and practical consensus in the process of forming students' cognitive activity. The lead approach to studying this problem is the activity-based approach which adequately expresses the objective and the essence of our research. The article is based on the concepts of pedagogy by N.F. Talyzina and reveals the conceptual and instrumental components of implementing the activity-based approach as a productive means of achieving theoretical and practical consensus in the process of forming students' cognitive activity. The materials of the article can be useful in modeling, designing and constructing a pedagogical concept aimed at achieving the balance between theoretical and practical components within the process of carrying out educational activity.

KEYWORDS
Activity-based approach, general types of cognitive activity, specific types of cognitive activity, stages of the acquisition process, theoretical and practical consensus

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Introduction

Within the context of the modern Russian education's lop-sided development determined by the monopolistic status of the competency-based doctrine (Chapayev, 2010) one of its key issues is the disturbance of balance of relations between the theoretical and practical components. The cornerstone of the modern education is developing the practical component in a person. There are hundreds and maybe even thousands of works dedicated to the practice-

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oriented pedagogy and glorifying it. This is all very well; practicality is a necessary quality of a person. Yet the problem is that the substantial level of practicality is planned to be achieved by sequestering the knowledge component. The term "knowledge pedagogy" is even invented; this pedagogy, according to its authors, is intended to reveal the crass conservatism of education built on knowledge (Chapayev, 2013). This in a schizophrenic manner is alongside the provisions on the society of knowledge. The problem is to harmonize the processes of knowledge acquisition to the processes of its successful application. It is no rocket science to sequester the knowledge component of the educational content in a primitive "arithmetic" manner: simply to reduce the number of hours for theory and fundamental courses. This is more than just a simplification approach. What is of crucial importance in solving the above-mentioned issue is finding the things in common between two necessities – necessity to acquire knowledge and the necessity to master the technologies of its productive application. In this case the need arises for the ideology of consensus, not the ideology of discard. We need the integration "…not at the expense of everyone or to everyone's disadvantage, but to everyone's advantage" (Akulinin, 1990).

Anti-scientific tendencies in pedagogy and outside of it could hardly be well-received by all the members of education community. N.F. Talyzina, an outstanding specialist in pedagogical psychology, is not satisfied with those, either. Even in the 1970s-1980s N.F. Talyzina noted that problems of consolidation of certain knowledge in school students' minds includes not only problems of ensuring its deliberate acquisition but also the problems of keeping in memory as the basis for further cognitive and practical activity (Talyzina, 1975, 1983). The analysis of the works by N.F. Talyzina (1970, 1975, 1983, 1993, 2007, 2009, 2011) shows that, in her opinion, the cognitive activity becomes a point of concentration of the things in common (points of "consensus"), achieving the consensus between the processes of forming antinomic (to a certain degree) components of students' cognitive activity – knowledge and skills, general and specific methods, knowledge, logical and specific methods. If we simplify (in the "mathematical" sense) the above-mentioned relations we can receive the correlation "knowledge – activity". Three stages of development of such relations are found in pedagogy: 1) transfer of knowledge without the ways of activity; 2) transfer of knowledge including the means of its application; and 3) knowledge and activity are organically combined in the content of education (Makhmutov, 1972). As can be seen, the third, the highest level includes integration of knowledge and activity. Thus, there are reasons to note the increase of the role of the activity-based approach in the history of education development, including the relations between knowledge and activity itself. Achieving their consensus makes it possible to solve a more general educational collision which permanently arises between theory and practice (Davydova & Dorozhkin, 2016). In the activity-oriented education this consensus can be achieved by "removing" the genetic differences between knowledge and activity within such new formations as methods of activity.

Methodological framework

Methods of research

The following theoretical methods were used: analysis, synthesis, abstract thinking, concretization, generalization, method of analogies, modeling, mental experiment.

Stages of the research

The research was carried out in three stages:

Stage 1 included the analysis of the existing methodological approaches to studying the problem;

Stage 2 included studying the historical-pedagogical materials on the problem and elaborating the authors' position regarding the evaluation of this material;

Stage 3 included generalization of the data of the studied historical-pedagogical material.

Results

The initial ideas of the activity-based approach as the most important methodological basis of Talyzina's pedagogy

General foundations of the activity-based approach

The issues of activity have been studied by a great number of Russian philosophers and theoreticians of culture L.P. Bueva (1968), M.S. Kagan (1974). The problems of the activity-based approach in psychology have been intensely developed A.N. Leontyev (1977, 1983), in pedagogical psychology V.V. Davydov (1983), P.I. Galperin (1976), D.V. Elkonin (1976). A.N. Leontyev (1977, 1983), the outstanding Soviet psychologist, especially contributed to the development of activity-based theory. According to his works, interiorization and exteriorization reflect the dialectics of interaction of internal and external activity, and in the long run define the processes of development, establishment and formation of a person by transforming external actions into internal. The necessity is determined by the fact that the central content of a child's development is its acquisition of the achievements of the historical development of mankind. A.N. Leontyev (1977; 1983) reveals the specific mechanism of perception by an individual of the environment. He is based on the understanding that impact of the historical experience during its acquisition "generates certain reactions in a child, and the reflection of these things". Yet "the first reactions of a child for the impact of these things are directly related to their external side and not to specific qualities. In order to historical achievements to be reflected as specific a child should perform in relation to them an activity, an adequate activity which is objected in them". V.V. Davydov (1983) provided brilliant generalization of the activity-based theory by A.N. Leontyev (1977, 1983). The main concepts of his interpretation in a generalized and slightly restructured form are the following: a) there are two forms of activity – external, objective, sensual-practical activity and internal, psychic activity of an individual mind; b) both forms of activity have social-historical origin and in principle general structure; c) at the same time the relations between the above types of activity are hierarchical: the genetically initial is sensual-practical activity while the internal psychic activity of an individual mind derives from it; the activity process in its essence expresses the relations between the said forms of activity through the mechanisms of interiorization and exteriorization, the first meaning transfer of

actions related to external activity onto a mental, internal level and the second meaning the reverse process of transfer from the inside; the structure of the technological "chain" of activity as integral system of external and internal components is formed by need ↔ motive ↔ target ↔ conditions and the correlated activity ↔ action ↔ operation; the ascertaining indicator of activity is objectivity: activity is determined by an object and then is mediated and regulated by it.

The main ideas of the activity-based concept of N.F. Talyzina

The main ideas of N.F. Talyzina are mainly based on the ideas by A.N. Leontyev, but Talyzina specifies the said ideas relative to the specific features of het concept of forming cognitive activity. This is confirmed both by the data of authors who analyze the works of N.F. Talyzina and her own ideas. According to T.V. Gabay (2014) and I.A. Zimnyaya (1997), N.F. Talyzina on the basis of the activity-based approach carried out the following: 1) developed psycho-diagnostic principles corresponding to the activity-based theory of learning and the methods of evaluating the initial level of a student and the achieved level of proficiency; 2) revealed the system of corresponding general and specific actions, and described the conditions for successful formation of scientific notions by children; 3) greatly contributed to forming a new view on the content of learning: along with the learned, subject-specific activity she revealed the activity of learning itself; 4) correlated these two types of activity and defined the status of teachable activity – the latter acting as a certain "means" of performing learning activity as it is; 5) confirmed by experiment that the most important condition of forming a generalized action is inclusion of a corresponding feature in its orientational basis, and justified the necessity to take into account during learning the indicators of independent performance of actions; 6) revealed that the central link of forming mental actions is its orientational basis which is characterized by the completeness, generalization and the degree of independent mastering of actions; 7) showed that, as compared to the behavioral theory of programming, the theory of stage-by-stage forming of mental actions which is a consecutive implementation of the activity-based approach is a more rational system of cognitive actions.

Analysis of the works by N.F. Talyzina (1970; 1975; 1983; 1993; 2007; 2009; 2011) provides the possibility to state several provisions that either confirm or add to the characteristics of her activity-based theory which in many ways was based along the Marxist theory of a person and at the same time contains several independent conclusions. Below are some of them:

1. Activity is a system, an integrity consisting of different elements in such a way that only this whole system of elements in certain connections and relations makes it possible to solve a task and implement activity. Consequently, the activity-based approach is at the same time a systematic approach. Due to this, the inextricable connection of mentality and activity looks like a connection between separate elements of this integrity. Under the laws of system analysis, we cannot understand any single element of the system if we remove it and do not take into account its place and role within the system.

2. The activity-based approach is psychology of actions. The approach determines the possibility to single out an adequate unit of analysis – an action. This provides the possibility to overcome functionalism: action as a system

cannot be received using only one function. No action consists of only one function. Consequently, psychology of functions must be replaced with psychology of actions.

3. The principal difference of the activity-based approach from all the others is that the real process is analyzed, the real process of interaction between a person and the world taken in its integrity and occurring as the process of solving a task. All the previous approaches "tore out" from this system of activity separate elements and by abstracting them from the system analyzed them by themselves.

4. The activity-based approach is built on understanding the social nature of a person. According to this understanding, a person is not born with "ready" logical thinking or knowledge about the world. He does not disclose laws of nature anew every time nor logical laws of thinking – they are mastered during the process of activity. A person is not born with "ready" mathematical or musical abilities, he can only acquire them by entering the world of mathematics or music – by acquiring the previous experience accumulated by the people in these spheres. From the principle of a person's social nature follows the fact that cognitive abilities of students are not innate but are formed during the learning process. The task of the science is to reveal the conditions which ensure formation of cognitive abilities. This implies the focus of the theory of learning on studying the laws of transfer of social conscience's phenomena to phenomena of individual conscience.

5. Three principles of the activity-based approach are: a) inextricable connection of mentality and activity; b) primacy of material forms and secondariness of psychic ones; and c) the social nature of the laws of a person's psychic development.

6. In the activity-based approach processes of learning and educating are considered as activity. For a teacher it means that during the teaching process he has a task to form certain types of activity including cognitive one. Such approach to teaching does not exclude thinking, memory and other processes but only means a different understanding of their nature, functional purpose and origin.

7. The activity-based approach requires absolutely new consideration of the correlation of knowledge and skills, namely: a) knowledge must be not be contrasted to skills but considered their part; b) knowledge cannot be mastered nor consolidated outside of the actions by a student; c) criterion of knowledge cannot be separated from actions; d) to know means to always perform some activity or actions related to this knowledge; and e) knowledge is a relative phenomenon.

8. The complex nature of knowledge generates the need for development of such criteria of its proficiency which would take into account the peculiar features of its reproduction: *evaluation of knowledge is performed by including it into different types of activity* and the latter are defined by the objectives of learning. For instance, is the learning objective is remembering (which is also important in the learning process!) then the skill of reproducing knowledge is valuable in this case. If it is necessary to use knowledge in solving tasks (which occurs more often) then a question arises: *in which types of activity must students have the skill of using taught knowledge*?

The functional purpose of the activity-based approach in the context of the article's range of problems

According to E.G. Yudin (1978), a philosopher, activity can be:

— an explanatory principle – a phenomenon with philosophical-methodological content expressing the universal basis of human world;

— as a subject of objective scientific studies, that is, something dividable and reproduced in the world view in accordance with the latter's methodological principles, the specifics of its tasks and the aggregate of the main notions;

— as a subject of management, that is, something to be organized within the system of functioning and development;

— as subject of design, that is, singling out means and conditions for the best implementation of certain types of activity;

— as value, that is, consideration of a place that activity occupies in different cultural systems.

Pedagogy focuses on the uniting, integrating function of activity. For instance, A.A. Kirsanov (1982) considered it as the methodological foundation of the individualization theory, M.I. Makhmutov (1972, 1985) as the "systemically important factor" of building a theory of learning, V.Ya. Shevchenko (1993) as the factor of subjectivity development. V.S. Bezrukova (1982) observes: "it is in the work, ultimately manifested alloy general and vocational education, their ultimate integration". G.M. Romantsev (1997), V.A. Fedorov (2001), A.V. Efanov (2002), Y.E. Neupokoeva & N.K. Chapaev (2016) studied the issues of forming vocational educational activity as the most prospective type of educational activity.

From our side we can add another heuristic function of the activity-based approach – function of *Aufhebung*. *Aufhebung* in Hegel's philosophy is a moment of development 'which combines both denial and keeping, preservation" (Ilyichev et al., 1983). What is substantial for us is the denial, keeping and preservation create a consensual model in which the process of development, transformation and finally of creating something new is carried out. In Talyzina's pedagogy skills and knowledge (ways of acting, actions, operations) in a certain sense are denied as independent units, acquiring instead their new meaning within the content of cognitive activity which is "a more developed unity" (Ilyichev et al., 1983). Thus, the function of *Aufhebung* is closely connected to the integrative (system-forming) role of the activity-based approach.

The content of technological support of the process of implementing the activity-based approach as a means to achieve theoretical and practical consensus in pedagogy by N.F. Talyzina

According to N.F. Talyzina, the basis of the technological support of the process of forming cognitive activity is separating within its structure general and specific types (methods) of learning activity. General types of cognitive activity are used when working with various types of knowledge: to plan one's activity, to control its performance, methods of logical thinking. Specific types of cognitive activity are used only within a certain area of knowledge (for instance, geometric transformation or phonetic analysis of a word).

Among the significant **general skills of cognitive activity** Talyzina lists the methods of comparison, deduction and phenomena definition.

1. Skill of comparing objects is a necessary indicator of developed reasoning, according to Talyzina. The most important operations that a student should master when **forming the method of comparison** are: a) to separate features of the objects; b) to define general and specific features; c) to single out the basis for comparison (one of the significant features); and d) to juxtapose objects according to this basis.

2. The initial moment in forming the methods of deduction is getting acquainted with features that are necessary, sufficient, necessary and at the same time sufficient. When learning the method of singling out the consequence students learn the following: a) to make conclusions from the fact of an object's belonging to this phenomenon; 2) perform tasks to bring out necessary features; 3) upon the general "acquaintance" with necessary features students grasp the notions of features that are necessary, sufficient, necessary and at the same time sufficient; 4) based on the brought-out necessary and sufficient features state under which conditions this object can be related to this notion; and 5) define whether the object possesses such features.

3. Conditions that must be taken into account in **teaching the methods of defining concepts**: a) training which should be started in primary school should also be preceded by learning the relations between generic concepts and subconcepts; b) students should understand that a subconcept always possess all the features of a generic concept, while a generic concept in relation to a subconcept is the following step of generalization; c) it should become obvious for students that the definition includes only necessary and at the same time sufficient features; and d) students should understand the relations of collateral subordination.

As can be seen from the above, the general methods of cognitive activity equally include theoretical and practical components. Thinking activity of students is an integral process of interaction of knowledge (representations) and intellectual skills. This is also characteristic for **specific methods of cognitive activity**. Their main distinction from general skills is reference to a specific subject material. In other words, in some cases they cannot be transferred to any other subject. A person possessing humanitarian reasoning can master no skills of mathematical or technical thinking. Developing the specific skills of cognitive activity is a necessary attribute of the productive learning process.

The consensual essence of the activity-based approach to solving the problem of theoretical and practical synthesis in the process of forming cognitive skills is distinctly stated by N.F. Talyzina revealing the correlation of knowledge, logical and specific methods of cognitive activity. This can also be attributed to the technological tools of the cognitive activity. They are as follows:

– one cannot care about knowledge without caring about the activity in which this knowledge is included;

– when studying any subject one first of all must think not about the number of learned facts or mastered skills but about learning the basic, fundamental knowledge and forming adequate general types of cognitive activity – logical and specific;

– when developing the content of learning per a subject and defining the sequence of its learning it is necessary to take into account connections and relations along all the three lines: a) subject-related, specific knowledge; b) specific types of activity; and c) logical methods of reasoning and logical knowledge included thereto;

– all these components are inter-related and form an integral non-dividable content of learning.

The content of technological support also includes **stages (technological chain) of digestion process**. N. F. Talyzina separates two groups of stages. The first group includes motivational stage and the stage of compiling a scheme of orientational basis of actions (stage of familiarizing students with activity and knowledge it includes). The second group includes stages of performing activity: actions in materialized (material) form, external speech actions, actions in external speech inwardly and mental actions.

1. **Motivational stage.** According to N.F. Talyzina, the main focus in the process of forming cognitive activity should be on internal motives. This is determined by the fact that external motives are not directly linked to digested knowledge and performed activity. In this case learning serves as a means of achieving other goals. Internal motives express cognitive interest related to exactly this subject. Thus, obtaining knowledge on this subject is not a means but a goal. Here we are speaking about direct satisfaction of cognitive need, on implementing the learning activity in the most innate sense. It becomes a direct motive of learning activity. Thus, learning can have different psychological meaning for a student. It can be a direct motive (driver) of cognitive activity and a means to achieve other goals which in this case are a motive making a student perform cognitive activity. Problematic education is the strongest didactic means of developing cognitive motivation (Chapayev & Akimova, 2014). It is viable to start learning any new activity by setting a problem which requires this activity. The very presence of a problem already sets some parameters of active cognitive and learning activity.

2. **Stage of compiling a scheme of orientational basis of actions.** At this stage students familiarize themselves with the new activity and the knowledge included thereto. When familiarizing students with the new activity a teacher must describe both how to define phenomena and show the process of definition, both how to solve certain tasks and to show the very process of solving. In order to do that a teacher, on the one hand, should reveal the knowledge of the subject with which students should act, and on the other hand, to reveal logic of the process of cognitive and learning process. Thus, learning starts from its result, so to say – from the knowledge on the subject but in this case knowledge is simply the initial point of learning. The real product of learning is acquiring the experience of performing learning and cognitive activity independently. A very important thing here is to fix a brought-out content of activity. This is necessary because students must not only understand the content of activity being formed but also its correct performance.

3. **Stage of materialized actions**. At this stage students work with a card containing the information on the performed activity and also receive a system of tasks that requires performing the activity. Initially such tasks can be practice-oriented, for example, when forming the knowledge on perpendicular lines drawings serve as tasks.

4. **Stage of external speech actions.** As students keep on mastering correct performance of practical actions they also master theoretical actions: learn to operate the indicators of a notion and logical rules without support from the external objects and without performing practical operations using their hands. There is a smooth transfer to external speech actions when students name features / indicators from memory.

5. **Stage of inward external speech.** At this stage a student works without support from schemes or reasoning aloud. Students speak out the complete process of solving a task but inwardly, without sound. This stage is a connecting "bridge" to the final stage.

6. **Stage of mental actions.** At this stage a task is solved in the form of internal speech as an individual process which does not require cooperation with other people. This stage is characterized by processes of generalization, reduction and automatization of actions.

Discussions

The anti-knowledge tradition in our country has a long history. So, for example, in the 1920s the process of digesting formulas, principles and laws in school was replaced by the practice in workshops, at city streets and agricultural facilities (farms). In the 1970s several Russian psychologists, for example, A.M. Matyushkin (1972), T.V. Kudryavtsev (1975) and others, according to Z.I. Kalmykova (1979), focused on describing "the negative role of the previous experience which can restrain the movement towards a principally new direction" and spoke of the necessity to overcome "the barrier of previous experience". Influenced by this type of research the teachers' community acquired a simplified attitude towards the issues of consolidation of knowledge and denied the necessity to carry out specialized work in this area. In the 1990s and later the defamation of knowledge reached a new quality level. In the scientific publications and in the system of education in general there began the ideologically substantiated battle against the notions of knowledge, skills and expertise. The problem reached the point when during the defence of dissertations in pedagogy candidates were afraid to say the word "knowledge". Psychologists also continued to contribute to the righteous battle with knowledge but in a slightly softer way, for instance, by contrasting knowledge to other elements of social experience. So, in example, it is stated that "a person is characterized not so much by knowledge, skills and expertise as by the attitude towards the reality" (Myasishchev, 1995). From our side we can note that, probably, in psychology using the logical schemes of the "or-or" type is justified in some cases. As regards pedagogy, here disjunctions can be used quite rarely. "The subject of education" – a person – is so diversified, dynamic and probabilistic that it is quite difficult to determine what can characterize it more and what less, and the most important thing is that it is difficult to separate one from the other" (Khamatnurov, Dudina & Chistik, 2016).

As was shown above, we have already proven that diminishing the role of deep knowledge acquisition and the knowledge by itself could not be accepted by all the psychology-pedagogical community. For instance, according to Z.I. Kalmykova (1979), the sharp contrasting of developmental teaching to the traditional teaching which is being criticized for *overestimation of the meaning of memory, solidity of knowledge and underestimation of the task to develop*

independent thinking is not always productive. The fact is that within the integral thinking activity its logical and heuristic components are in close contact. This determines the fact that *consolidation of knowledge is a quite complex mnemonic activity in which memory and thinking act in inextricable connection. Knowledge is the most important component of mental development*. In support of her position Z.I. Kalmykova (1979) refers to the words of V.F. Shatalov, a well-known teacher-innovator, who said that *a student working with a reference book differs from a student who knows all the formals in the same way as a chess player-beginner differs from a grand master – he sees only one step ahead*. Deep consolidation of knowledge not only in short-term but also in long-term memory ensures the freedom of operating it in solving tasks, allows not to be distracted by minor things and *to focus on the main point – to search for a key to solve the problem. Good knowledge of formulas, essential characteristics of terms and regularities and the main theoretical provisions ensures their easy actualization in complex situations*. Yes, creative thinking crosses the boundaries of existing knowledge. Yet, in order to open the new, to reject the already known, old, it is necessary to acquire this old, to possess broad range of knowledge (including its operational side) which is sufficient for movement ahead and ready for actualization in accordance with the set task. In principle, without the initial minimum of knowledge there is no solution of problems and there can be none. Knowledge is acquired during the process of remembering. In some cases, for instance, when the volume of material is not large, nonvoluntary remembering may be effective. During the process of learning a student encounters so large a volume of knowledge that to consolidate it requires special efforts and special organization of mnemonic activity. It is based on the goal to remember knowledge which is the basis of a school subject. It is given right after the initial mastering of new terms or regularities. The goal to remember contributes to growth of thinking activity, the degree of self-regulation and self-control. All this, without doubt, is aimed at increasing the effectiveness of mastering. эффективности усвоения. Undoubtedly, special training of rational methods of mnemonic activity will greatly contribute to ensure the solidity of knowledge. The position of Z.I. Kalmykova (1979) regarding the fundamental role of knowledge in solving practical tasks (problems, issues etc.) is confirmed by the modern research. For instance, the results of the experiments carried out under the supervision of S.A. Shapiro (2005) have shown that in simple situations, when reproductive thinking is needed, it is not necessary to know formulas as it is quite possible to use reference books etc. Yet in solving non-standard tasks, when it is necessary to activate productive thinking, consolidation of the main formulas in memory is required. A. Levenchuk (2015), a most experienced expert in the field of engineering management, insists that in educational institutions disciplines and knowledge should be taught and at a production facility - work with specific technologies. In his view, knowledge is not an enemy of technologies (practice) but they get along just fine in accordance with the ancient principle “to Caesar what is Caesar’s” and form together integral and distinct unity.

Conclusion

1. Both in theoretical and in practical activity we can distinguish between objective experience (experience of knowledge) and operational experience (experience of methods of actions with objects and knowledge). A person needs

both types of activity. Theoretical activity allows to foresee changes in the subject reality, forecast the results of practical actions and to choose the most useful actions. During the practical activity the subject reality is changed.

2. In the learning activity there are additional relations between knowledge and skills. Knowledge manifests through skills and skills – through knowledge. In other words, skills and knowledge are mutually verifiable things. Thai is why a question whether a student knows something or not to a large extent depends on which actions he is able to perform during test tasks. So, for instance, knowing a geometry theorem can manifest itself as a) a skill of reproducing its wording, b) a skill of using this theorem in solving some problems, and c) as a skill of independent proving any theorems of this type. On the other hand, any of these skills is based on the corresponding knowledge, that is, a student must know how to a) reproduce the wording of a theorem, b) use this theorem in solving some problems, and c) independently prove any theorems of this type.

3. We can agree with the opinion that a school student's personality cannot be reduced to the specific features of his activity. Yet a person expresses itself and develops in the process of performing activity. The implementation of the activity-based approach can form such conditions when the content of education becomes an integral aggregate of the methods of activity that organically integrate its theoretical and practical components. In other words, on the pedagogical level the principle of the unity of conscience and activity is implemented in accordance to which *things of conscience comprise an actual moment in movement and activity* (Leontyev, 1977).

Recommendations

The research can be recommended to academic specialists and practitioners in the sphere of education, master's degree students and post-graduate students.

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