

General Psychological Basis for the Formation of Education at a Technical University

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Abstract — The paper discusses the main directions of modern education at the technical universities of Russia in the context of a general psychological basis. As a rule, starting from the second half of the 18th century the educational process is becoming the object of theoretical, not only pedagogical, but also psychological thought. Naturally, this process was interpreted before the second stage of the development of pedagogical psychology in the context of dominant psychological theories, the positions of which were related to the learning process. The process of learning has been interpreted within the categories and concepts of these theories. Until the end of the last century, the associative theory has been dominating, and at the beginning of the 20th century two theories – behaviorism and Gestalt psychology – formulated the basic provisions of learning. Only at the third stage of development of pedagogical psychology, in the second half of the 20th century there were independent theories or, more precisely, learning directions. The review considers general psychological provisions of associative theory, behaviorism and Gestalt psychology of education (learning) and developments, which had a considerable impact on the general theory of education.

Keywords — education, psychology, pedagogy, association, behavioristic and gestalt psychological model

I. INTRODUCTION

The idea of association as a possible mechanism for psyche phenomena was first expressed by J. Locke (1632-1704), although the very concept of association, its types, and features were introduced by Aristotle. D. Hartley (1747) clearly explained the basic principle of the future school, according to which everything is explained by primary feelings and associations of thus caused perceptions or ideas. D. Hartley based his opinion on the materialistic idea that external exposure causes the response action of the nervous tissue, where large and small vibrations occur. According to D. Hartley, “once created, small vibrations persist and accumulate, forming an “organ” that mediates subsequent reactions to new external influences. This makes the body a learning system with the corresponding history. Memory is the basis of learning [1]. For Hartley it is a general fundamental property of the nervous organization”. It is worth noting a crucial role of memory in education, according to D. Hartley.

The reasons for forming associations of perceptions or ideas were further considered by J.S. Mill, who argued that “our ideas (perceptions) are born and exist in the order similar to sensations, from which they are a simple copy. The main law is the association of ideas, and there seems to be two reasons for the association: the vitality of associated sensations and the frequent repetition of association”. The analysis of the main laws of association (associations by similarity, associations by adjacency (coincidence by place or time), causal associations, etc.) and the secondary laws of their formation, which include “duration of initial impressions, their vitality, frequency, time delay”, made researchers conclude that these laws are nothing more than “a list of conditions for better memorization”. Consequently, memorization was determined by the action of the association.

It should be noted that associative psychology also considered thinking as a kind of reproductive function of memory. According to researchers of the problem of thinking, “the question of the reproduction of ideas was one of the central issues of the associative theory of thinking, because the movement of thought depended on which ideas and in what order will be reproduced from memory reserves”. Similar to memory, one of the main laws of reproductive thinking was the law of reinforcing the strength of associations depending on the frequency of their repetition (although its scope has somewhat changed). There is no doubt that the importance planted by the associative psychology on the repetition frequency for the formation and strengthening of associations was a kind of theoretical justification for the demand made at that time by educators to teach material through multiple, mechanical repetition.

H. Ebbinghaus’s experimental data simultaneously characterized a person’s ability to both memorize and learn material, which later allowed researchers to closely converge the two concepts of “memory” and “learning” (as acquiring and maintaining any skill or a system of skills). In the future works of behaviorists there is also a complete fusion of these concepts.

II. RESULTS AND DISCUSSION

In the late 19th century, E. Thorndike, a striking representative of experimental comparative psychology, put

forward one fundamental theory of learning of that time – trial-and-error theory. Essentially, an animal (E. Thorndike carried out experiments on cats) as a result of multiple trials and errors accidentally finds the reaction, which corresponds to the irritant – stimulus. This coincidence is encouraging, which supports this reaction and links it to the stimulus. If such a stimulus is repeated, the reaction will also be repeated. This is the first and basic law of E. Thorndike – the law of effect. The second law – the law of exercise – is that the response to the stimulus is caused by the number of repetitions, strength and duration of the stimulus exposure. According to the third law of teaching – the law of readiness, the reaction of an animal depends on its readiness for a given action. As E. Thorndike argued, “only a hungry cat will seek food”. In developing his theory, E. Thorndike subsequently identified several other factors of learning, of which the factor of “identical elements” plays a special role [2]. In the subsequent development of the learning theory, this factor relates to the principle of skill transfer. Thus, E. Thorndike believed that such a transfer occurs only when there are identical elements in different situations. Further research by E. Thorndike led to some change in the second law, especially in relation to the description of human learning. E. Thorndike introduced the notion of knowledge of results as another pattern of learning, because he claimed that “practice without knowledge of results, however long, is useless”. At the same time, knowledge of the results is seen by E. Thorndike as a concomitant moment of the law of effect, enhancing the strength of the resulting bond between stimulus and reaction. E. Thorndike’s works, associative in essence and behavioristic in method and approach, had a significant influence on the theoretical thinking of the educational process.

A critical analysis of the trial-and-error theory was given by K. Koffka, one of the representatives of gestalt psychology, who worked in the field of child learning and mental development. Unlike associative psychology for gestalt psychology, the initial is integer, structure, gestaltism, but not elements. As the researchers of this theory note, gestalt psychology was based on the postulate that “the emergence of a structure is the organization itself, and, in fact, spontaneous organization”, an instant organization, or, more precisely, a self-organization of the material. It occurs in the process of perception or remembering in accordance with the principles of proximity, similarity, “closure”, good continuation, “good shape” of an object of perception, remembering, acting independently of the subject. Hence, the primary and initial task of learning is to teach understanding, coverage of the whole, configuration, overall correlation of all parts of the whole, their ratio. Gestalt psychologists point out that such understanding comes as a result of the sudden emergence of a decision or insight.

In a debate with E. Thorndike about the validity of the trial-and-error theory, K. Koffka correctly notes that multiple meaningless repetition can only cause harm, that it is necessary to first understand the path of action, its structure, or gestalt, and then repeat this action. “The statement that the animal is being trained in a completely unthinkable way must be rejected”. This path of learning in targeted human learning should be rejected with greater reason. By analyzing the

learning process, K. Koffka puts a fairly large role on imitation. He considers two possibilities of its application: either there is blind imitation without understanding, and then thinking, or “the understanding of the model precedes the imitation action. On the basis of the actual material it can be concluded that learning through imitation is carried out mainly in the second form”.

K. Koffka believes that “... learning through imitation in comparison with spontaneous learning turns out to be easier, not to mention that such skills as speech and writing can be learned by imitation only”. K. Koffka pays great attention to the problem of the role model and emphasizes that the situation of training “is improved with the model already by the fact that the starting point of the solution is noted”.

At the same time, K. Koffka himself makes a substantial reservation that learning is not limited to memory work alone, it needs to explain how a new one is formed in this process. By correctly noting the relationship between understanding the action and fulfilling it, K. Koffka, however, places too much emphasis on imitation, especially when mastering speech in a native language. He does not note recitality so typical for a child, his independent detection of language patterns [3].

Emerging almost simultaneously with gestalt psychology, behaviorism to a certain extent inherited the philosophical position of American functionalism declared by W. James – J. Dewey, which manifests itself in a pragmatic approach to the consideration of the psyche. According to W. James, consciousness expressed in skills, knowledge, perception is always related to the environment, it is defined as the functioning state of adjustment. Accordingly, within this approach only those body reactions that help it adapt to the environment are useful.

The scientific and experimental basis of behaviorism was, on the one hand, E. Thorndike’s provisions on the nature of learning and H. Ebbinghaus’s factual data on verbal memorization. On the other hand, behaviorism, and especially E. Tolman’s neobehaviorism, was based on I.P. Pavlov’s teaching on conditional reflexes. However, due to the positivist approach to the psyche, the basic, central link of the conditional reflex was ignored by the founder of this psychological theory, J. Watson. He left only the extreme members in the reflex scheme, denoting their “stimulus” (S) and “reaction” (R). The “stimulus-* response” relation (S – >R) defined the skill as a developed, “learned” response to a certain stimulus.

The main premise of behaviorism, which allows its representatives to transfer the conclusions obtained by E. Thorndike in animal experiments to human behavior, is J. Watson’s assertion that “a man is an animal different from other animals only in the type of behavior he exhibits. Speech is action, i.e. behavior. Language is skill that with the lips closed is thinking. What psychologists call a thought is nothing more than thinking to oneself”. In other words, according to early behaviorism, all human mental activity, like an animal, can be described in terms of “learning” and “skill”.

These two concepts – “learning” as acquiring individual experience and “skill” as a strengthened stimulus bond – are

standard reactions for J. Watson. Ignoring J. Watson's "consciousness", "thinking", justifies the impossibility of their objective direct study. Therefore, according to J. Watson, behaviorism as a true natural science can do without such intelligent concepts as "brain", "mind", "consciousness" [4]. The main task of psychology is to study human behavior. The study of a person's speech behavior and its teaching is viewed by behaviorism in the same context.

The neobehaviorism by E. Tolman, C. Hull, E. Guthrie, B. Skinner, which introduced the concepts of intermediate variables, cognition map, value matrix, goal, motivation, anticipation, behavior management, considerably changed the general content of J. Watson's orthodox behaviorism. This laid the basis for neobehavioristic theories of E. Tolman's cognitive behaviorism (with central image category), C. Hull's hypothetical-deductive behaviorism (with central motivation, anticipation category), and B. Skinner's operant behaviorism (with central management category). It was in neobehaviorism that the laws of exercise and E. Thorndike's effect were clarified. The first law was supplemented not only by the action of repetition frequency, but also by the formation of a comprehensive (gestalt) structure, a cognitive map affecting the efficiency of learning. The law of effect (or reinforcement) is related not only to the satisfaction of need, but also to confirmation (on the basis of anticipation) of the cognitive map [5].

Since the beginning of the century, certain directions and theories of learning have been formed on the basis of these psychological theories. According to one of them, the main task of "formal" education is to develop child's abilities necessary to extract knowledge. According to another, the main purpose of education is only to learn a certain amount of knowledge. Based on the postulate that "a child does not develop and raised, but develops through upbringing and learning", S.L. Rubenstein emphasized the artificiality of such opposition of two learning directions. He believed that in the real course of learning (through which a child goes by developing) and development (which is carried out in the course of learning), both take place: the mastery of a certain system of knowledge, and at the same time the development of the child's abilities.

At the same time, according to N.A. Menchinskaya, who expressed this idea most fully, education is based on the mechanism of associations (understood by the author as a synonym of the "time link" in the conditional reflex theory of I.P. Pavlov), including complex analytical and synthetic activities. Accordingly, all the mentioned features of education and consolidation of associations, and above all their repetition, should be taken into account by a teacher in the organization of the educational process. Considering the peculiarities of analytical and synthetic activities of students, the strengthening of associative bonds are still significant requirements of education.

Since the middle of the century, the directions of learning have polarized around its two characteristics: manageability and formation of the students' ability to "extract" knowledge on their own. At the same time, none of the directions is currently present in pure form, one includes the elements of

the other. However, a necessary requirement for each of them is disciplinary, developing education and activity of the subject of learning.

Main directions of modern education:

- All modern directions of education can be considered from the perspective of some common grounds. Forms of contact and distance education can be identified on the basis of direct (mediate) interaction of a teacher and a student. The first form includes all traditionally developed directions of education, while the second – currently created education "at a distance" with the help of special technical input and output interacting means.
- On the basis of the principle of consciousness (intuitivity), education is related to the nature of learning experience. This is, for example, the intuitive mastering of a child's native language, defined by L.S. Vygotsky as a bottom-up path (this includes the suggestopedic direction of G.K. Lozanov, which arose in the mid-1960s), and learning based on the principle of consciousness.
- When considering the learning theories based on the principle of consciousness, it is very important to answer the question of what students are aware of in the learning process. According to N.F. Talyzina, if students are aware only of rules, means, it is a form of the so-called traditional, "reporting, dogmatic" learning. If it is an awareness of the actions themselves, subject to certain rules, it is a theory of the formation of mental actions (P. Ya. Galperin, N.F. Talyzina). If it is the awareness of the program, the algorithm of actions, it is programmed learning, the theory of algorithmization (N.F. Talyzina, L.N. Landa). If it is the awareness of a problem or a task, for which it is necessary to master means, methods, techniques, it is a problem-based learning [6].
- Based on the educational process management, learning can be divided into a) not based on it (e.g. traditional learning) and b) considering management as the primary learning mechanism (the theory of gradual formation of mental actions, programmed, algorithm-driven learning).
- According to the basis of the relationship between education and culture, the following can be distinguished: a) training, the basis of which is the projection of the image of culture into education and formation of project activity of students (theory of project learning), and b) learning based on disciplinary-subject principle (traditional learning).
- On the basis of the connection of training with future activities, there is sign-contextual, or contextual learning (A.A. Verbitsky) and traditional learning of the non-contextual type.
- Learning, including active forms and methods, and traditional (informational, reporting) learning are identified by the basis of the learning organization method.

According to the above grounds, traditional learning can be described as contact (may be distance), reporting, based on the principle of consciousness (awareness of the subject of mastery itself – knowledge), purposefully unmanageable, built on a disciplinary-subject principle, out-of-context (in the

system of higher education – without purposeful modeling of future professional activity in the process of education). The definition of traditional learning by N.F. Talyzina as information-reporting, dogmatic, passive reflects all the above-mentioned characteristics. At the same time, it should be stressed that this is a statement definition, not an assessment definition of the type “good” – “bad” [7]. Traditional learning contains all basic prerequisites and conditions of knowledge acquisition, the effective realization of which is determined by many factors, in particular individual-psychological peculiarities of students. Th study of M.K. Kabardov shows that people characterized by an analytical type of intellectual activity – “thinkers” – are more capable, for example, of acquiring traditional forms of foreign language learning than active and game forms of learning.

Along with traditional learning there are other directions in education: problem-based learning; programmed learning; learning based on the theory of gradual formation of mental actions (P.Ya. Galperin, N.F. Talyzina); algorithm-based learning; developing sign-context learning, project-based learning, etc. At present, as W. Okon emphasizes learning is a multilateral process that includes diverse elements of its various directions. This multilateralism of education allows taking advantage of its direction for each stage of the educational system, for each specific educational situation, according to the capabilities and individual-psychological characteristics of both the students and the teacher himself. In the general form multilateralism of learning is presented by W. Okon as a set of its various compositions.

TABLE I. MULTILATERALISM OF LEARNING BY W. OKON

Way of learning	Teaching method	Position (student)	Action strategy
Assimilation	Delivery	Reception	Information
Discovery	Problem	Research	Problem
Experience	Exposure	Effect	Emotion
Activity	Practice	Action	Operation

Problem-based learning is based on obtaining new knowledge by students by solving theoretical and practical problems, tasks in problem situations thus created (W. Okon, M.I. Makhmutov, A.M. Matyushkin, T.V. Kudryavtsev, I.Ya. Lerner, et al.). A problem situation arises if a person has a cognitive need and intellectual ability to solve the problem in case of difficulty, contradiction between old and new, known and unknown, given and sought for, conditions and requirements. Problem situations are differentiated by A.M. Matyushkin according to the following criteria: 1) the structure of actions to be performed in solving the problem (for example, finding the method of action); 2) the level of development of these actions in the person solving the problem, and 3) difficulties of the problem situation depending on intellectual abilities.

Problem-based learning includes several stages: awareness of the problem situation, formulation of the problem based on the analysis of situations, solution of the problem, including nomination, change and testing of hypotheses, solution verification. This process is deployed in a similar way to the three phases of thinking (according to S.L. Rubinstein), which is created in a problem situation and includes the awareness of the problem, its solution and the ultimate conclusion. Therefore, problem-based learning is based on analytical and synthetic activity of students implemented in reasoning and reflection. It is a heuristic, research type of learning with great developing potential.

Problem-based learning can have a different level of difficulty for the learner depending on what and how many actions he or she takes to solve the problem. V.A. Krutetskiy proposed a scheme of problem levels of education in comparison with the traditional one by separating the actions of a teacher and a student.

The emergence of programmed learning is related to the name of B.F. Skinner, who in 1954 appealed to the pedagogical community to increase the efficiency of teaching by managing this process. The management category is seen as central to programming: “True problem is that at all levels of education learning is ensured with good management [8].

Programmed learning is based on general (V.P. Bepalko) and private didactic principles of consistency, accessibility, systematization, autonomy. These principles are implemented during the execution of the main element of programmed learning – the learning program representing an ordered sequence of tasks. For programmed learning, the presence of a “didactic machine” (or a programmed study guide) is essential. In this type of learning, an individual approach is implemented to a certain extent as taking into account the nature of the student’s mastery of the program. However, the main is that the process of learning, developing skills is controlled by the program.

There are three main forms of programming: linear, branched and combined. According to B.F. Skinner, a behavioristic understanding of learning as establishing a link between stimulus and reaction is at the heart of the chronologically first form of programming – linear. The correct step of a student in this form of learning is supported, which serves a signal for further execution of the program. As evidenced by W. Okon, the linear program, in Skinner’s understanding, is characterized by the following:

- didactic material is divided into minor doses called steps, which students overcome relatively easily, step by step;
- questions or gaps contained in the individual frame of the program should not be very difficult so that students do not lose interest;
- students themselves answer questions and fill in the gaps with the necessary information;
- students are immediately informed in the course of their education whether their answers are right or wrong;
- all students take turns throughout the program, but everyone does it at a convenient pace;

- significant number of instructions at the beginning of the program to facilitate the receipt of a response is gradually limited;

- in order to avoid mechanical storage of information, the same idea is repeated in different versions within several program frames.

Branched programming (N. Crowder) differs from linear by its multiplicity (and repetition) of step selection. It is aimed not so much at the error-free action, but at the teacher's understanding (and the learners themselves) of the reason that can cause the error. Accordingly, branched programming requires some mental effort from a learner, in fact it is "the control of the thinking process" (W. Okon). Feedback in this form of programming, and not only positive reinforcement (according to the law of effect) confirms the correctness of the answer [9]. A comprehensive program can be a large text containing many answers to questions. Here, the detailed responses proposed in the "frames" are either assessed as correct or rejected, in both cases accompanied by full reasoning. If the answer is not correct, the student is asked to return to the original text, think and find another solution. If the answer is correct, the following questions are offered, etc. As W. Okon notes, the questions, in Crowder's understanding, have the purpose of:

- a) checking whether a student knows the material contained in a given frame;

- b) in case of a negative response, referring a student to coordinating and accordingly justifying frames;

- c) fixing basic information by means of rational exercises;

- d) increasing student's efforts and simultaneously eliminating mechanical learning through multiple repetition of information;

- e) forming the required motivation of a student. The branched program is more complete than the linear one, takes into account the peculiarities of human learning (motivation, mindfulness, influence of the progress pace). Combined programming and its other forms are generally close to those discussed above.

Programmed learning in the late 1960s and early 1970s was further developed in the works of L.N. Landa, who suggested to make this process algorithm-driven.

The advantages of management and programming in the educational process are most fully and theoretically presented in the direction of learning based on the psychological theory of gradual formation of mental actions. Having set the task of "revealing the mystery of the mental process", i.e. how material, substantive can be transformed into ideal, mental, P.Ya. Galperin developed a comprehensive scheme of this transformation. Together with N.F. Talyzina this theory was implemented in practice in the course of education [10]. The initial theoretical postulates included the following provisions developed in the domestic psychology by L.S. Vygotsky, S.L. Rubenstein, A.N. Leontiev:

- any internal psychics a transformed, interiorized external; first the psychic function acts as an interpsychic, then as an intrapsychic (L.S. Vygotsky);

- mentality (consciousness) and activity is the essence unity, but not identity (S.L. Rubenstein): psychic is formed in activity, activity is regulated by psychic (image, thought, plan);

- psychic, internal activity has the same structure as external, substantive (A.N. Leontiev, N.F. Talyzina);

- psychic development has a social nature. "The development of human individuals went not through the deployment of internal inherited species experience, but through the learning of external social experience fixed in the means of production, in language" (A.N. Leontiev);

- activity nature of psychic, image "allows considering action as its unit. Hence, imaging can only be controlled through the actions by which it is generated".

P.Ya. Galperin set fundamentally new tasks for learning: to describe any formed action with a set of its properties to be formed; to create conditions for shaping these properties; to develop a system of benchmarks necessary and sufficient to control the correctness of action generation and error avoidance. P.Ya. Galperin distinguished two parts of the object action being mastered: understanding and ability to perform it. The first part plays the role of orientation and is called indicative, the second part – executive [11]. P.Ya. Galperin attached special importance to the indicative part considering it "a manager", later he will call it the "pilot chart". As a result of the study conducted by P.Ya. Galperin and his students, it was found that:

"a. Along with actions, sensual images and concepts about the subjects of these actions are formed. The formation of actions, images and concepts constitutes different sides of the same process. Moreover, the schemes of action and the schemes of objects can largely replace each other in the sense that the known properties of the object begin to denote certain modes of action, and behind each element of action there are certain properties of its object.

b. The mental plan constitutes only one of the ideal plans. The other is the plan of perception. It is possible that the third independent plan of action of an individual is a speech plan. In any case, the mental plan is formed only on the basis of the speech form of action.

c. The action is transferred to the ideal plan either in its entirety or only in its indicative part. In this latter case, the executive part of the action remains in material terms and, changing together with the indicative part, eventually becomes a motor skill.

d. The transfer of the action to the ideal, in particular to the mental plan, is carried out by reflecting its substantive content by means of each of these plans and is expressed by repeated sequential changes in the form of the action.

e. The transfer of the action to the mental plan, its interiorization constitutes only one line of its changes. Other, inevitable and equally important lines constitute changes:

completeness of action links, measures of their differentiation, measures of their mastery, pace, rhythm and force indicators. These changes lead, first, to a change in the execution methods and forms of feedback, second, to a change in the quality of action achieved. The first of these changes lead to the transformation of a perfectly executed action into something that in self-surveillance reveals as a mental process; the second allow controlling the formation of action properties such as flexibility, mindfulness, consciousness, criticality, etc.”

P.Ya. Galperin considered mindfulness as the main characteristic of performed actions. Compared to traditional trial-and-error learning, P.Ya. Galperin justified the advantages of the second and especially the third type of learning, where the full indicative basis of student’s action is realized.

This theory was the foundation of the educational process programming developed by N.F. Talyzina as a program of its management from the position of the management theory and on the basis of the theory of P.Ya. Galperin on the systematic formation of mental actions by N.F. Talyzina develops the main elements of the new direction of educational process programming [13]. Its purpose is to determine the initial level of cognitive activity of students; identify new cognitive actions; define the content of learning as a system of mental activity; identify means, i.e. actions, as generalized means of acquiring a wide range of knowledge on the third type of orientation; identify five main stages of learning, each of which requires action; develop the algorithm (system of requirements) of actions; feedback and regulation of the learning process.

General characteristics of actions are essential for the implementation of this direction of programming: material in form, external, speech “to oneself”, mental); by the degree of generality; extent of development; the extent to which the action is developed and whether it is prepared or developed on its own. There are indicative, executive and control functions within the action. According to N.F. Talyzina, “any action of a person represents some microsystem of management that includes the “management structure” (indicative part of action), executive, “working structure” (executive part of action), tracking and comparing mechanism (management part of action)”. The central element of mental action is its indicative basis characterized by completeness, generality and degree of independent mastering of actions [14]. The third type of indicative basis of actions distinguished by the optimum of completeness, generality, autonomy provides the highest efficiency of mental actions. Comparing the existing approaches to learning, N.F. Talyzina notes that compared to the behaviorist theory of programming, the theory of gradual formation of mental actions “programs and builds the most rational structure (system of cognitive actions)”. It is true management of human development. At the same time, according to S.D. Smirnov, this theory serves as an example of “consistent implementation of an activity approach to learning”.

At present, sign-contextual, or contextual learning is quite widespread in vocational (higher and secondary) education. In

this learning, information is presented in the form of educational texts (“signs”), and the tasks designed on the basis of information contained therein set the context for future professional activities. According to A.A. Verbitsky, the substantive and social content of future professional activity is modeled in the educational process by all didactic means, forms, methods, among which one of the main places is taken by the business game [14]. It is known that the business game is a fairly common, multivariate form of modern university and post-university education. There are innovative, positional games (A.A. Tyukov); organizational and learning games (S.D. Neverkovich); educational games (V.S. Lazarev); organizational and thinking games (O.S. Anisimov); organizational and activity games (Yu.V. Gromyko), etc. In the concept of A.A. Verbitsky and his followers, the business game is a learning tool. It is a form of sign-and-contextual learning in which the participants carry out “quasi-professional activities bearing features of both teaching and labor”. Business game is an active form of pragmatist learning [15]. It involves the definition of goals (game and pedagogical: didactic and educational), the content of the game and the presence of game and simulation models (A.A. Verbitsky, N.V. Borisova). The simulation model, which reflects a didactically processed (generalization, simplification, problematic) fragment of professional reality, is the substantive basis of students’ quasi-professional activities.

III. CONCLUSION

The review studied the general psychological basis for the formation of learning within current education. The general psychological provisions of associative, behavioristic and gestalt psychological theories of learning and development, which had a significant influence on the general theory of learning, are considered, namely:

- K. Koffka’s idea that learning by imitation compared to spontaneous learning turns out to be easier not to mention that such skills as speech and writing can be learned by imitation only;
- The idea of E. Thorndike, a vivid representative of experimental comparative psychology, called trial-and-error theory;
- The idea of J. Watson. Ignoring consciousness and thinking. J. Watson justified this by the impossibility of their objective direct study. For this reason, according to J. Watson, behaviorism as a genuine natural science can do without such theoretic concepts as “brain”, “mind”, “consciousness”.

All the above-stated ideas formed the basis for problem, program, sign and contextual learning that in general represents the interests of behavioristic and gestalt psychological theories of education (learning) and development which, at a turn of the 18th – 20th century had a considerable impact on the general theory of learning and formed the basis for the natural-scientific and humanitarian disciplines taught at technical schools.

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