

§2.3. PSYCHOLOGICAL AND PEDAGOGICAL FOUNDATIONS OF THE DEVELOPMENT OF LOGICAL THINKING OF YOUNGER SCHOOLCHILDREN IN THE PROCESS OF TEACHING MATHEMATICS, NATURAL SCIENCE AND DRAWING

Main concept, which characterizes mission and goals contemporary Uzbekistan education, is concept "development". At process education these the most important human capabilities transferred by teachers and acquired by students in the form of universal learning activities.

The development of the personality of the student based on the assimilation of universal educational activities, knowledge and development of the world is the goal and main result school education.

Huge role in cognition and self-development plays thinking. Thought e nor e is a set of mental processes that lie in o sn o ve knowledge; it is precisely the active side of cognition that is attributed to thinking - niya : attention, in o acceptance, the process of associations, the formation of concepts and judgments [9]. In a closer logical sense, thinking includes imagine only o the formation of judgments and the mind o conclusions through analysis and synthesis e - per p o notions.

Thinking - this is process cognitive activities individual, characterized by a generalized and indirect reflection in the mind and - human research of connections and relationships between objects and phenomena of action - validity.

V.V. Levites represents thinking how process solutions tasks, questions, problems, constantly put forward by life situations before society. result given process are new knowledge, emerging in result solutions data tasks. Note what percent e ss finding the required solutions are often quite difficult, so mental activity, this is activity, which requires certain attention and patience.

Thinking is a function of the human brain, a special form where its reflex, analytical and synthetic activity is manifested, which toray has support in the second signal system.

The process of thinking is carried out with the help of mental operations: comparisons, a analysis a, synthesis e for, a abstraction, generalization and concretization a t, allowing to reveal all the important connections and relationships between objects, phenomena and facts.

Psychologists identified the features of thinking as a mental process [4]:

First, thinking is mediated. If a person fails to know something directly, directly, then he can know it indirectly, indirectly: some properties are known through other, unknown is known through famous [eight].

Secondly, thinking is generalized. Generalization as cognition of the general and essential in the object a x of reality occurs for the reason that o all the properties of a of these object o in are connected together. O the general exists and manifests itself only in something separate, concrete. Generalizations are expressed by people with the help of speech, languages.

Thirdly, thinking is always associated with the solution of a particular problem, emerging in process knowledge or in practical activities. The process of thinking is most clearly manifested only when a problem situation arises that needs to be solved: a question arises, the answer to which is the purpose of thinking. And the answer to this question is located not immediately, but with the help of certain mental operations, in the process of which the modification and transformation of the existing information.

Fourthly, thinking is closely connected with speech, this is another extremely

important feature of it. Thoughts are always clothed in speech form, even in cases where speech does not have a sound form, for example in the case of deaf people. We always think in words, we cannot think, without saying a word.

Important meaning in process learning gave logic Czech teacher Ya.A. Komensky [14]. He suggested introducing children to short rules of inference, confirm these rules with vivid examples from life, and then develop students' logical thinking by discussing controversial problems of physics, mathematics, ethics. Significant focus in teaching children he gave use analysis and synthesis, a also reception Comparisons.

R.S. Nemov considers that thinking is a theoretical and practical activity that includes actions and operations of an orienting-research nature [10]. By the nature of the tasks they solve highlighted two main view a thinking: theoretical and practical. On the figure presented main constituents theoretical and practical thinking.

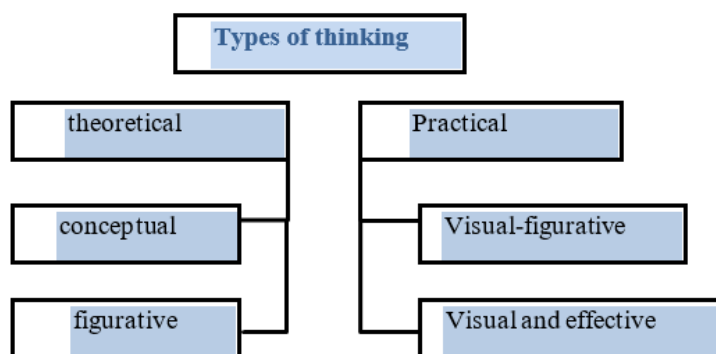


Fig. 2.1. Kinds thinking

Theoretical conceptual thinking is thinking, in the process which a person does not use the senses, but performs mental activity, expresses judgments does conclusions, operating concepts. This kind of thinking is typical for scientific theoretic and research studies, as it most accurately and generally reflects reality.

Inference is a form of thinking in which a new a true judgment based on comparison and analysis of several judgments. Reasoning is either deductive or inductive. Induction and deduction agreed between yourself So same, how synthesis and analysis. And not costs unilaterally exalt one from them before heaven per check another, a it is necessary to use each in its place, and this can be achieved only in volume case, if take account of them connection between yourself and mutual complement each other. In induction we reason from particular judgments to general in deduction move reasoning under construction vice versa, from general judgments we let's go to private. Like o in would neither was x o d reasoning, main then, what students receive new knowledge.

Theoretical figurative thinking is connected with the use by a person in the process of thinking of images, their transformation and manipulation. These images can be retrieved directly from long-term memory or created by a person's imagination. Thanks to this kind thinking is possible to the greatest extent possible to recreate the multitude of various actual characteristics of the subject. In the image, you can fix the simultaneous vision of the object from different points of view. Important a feature of figurative thinking is the establishment of unusual, "incredible" combinations items and them properties.

So the way we considered three forms thinking: concept, judgment, inference. The

main task of figurative thinking is the creation of images and their presentation. education in accordance with the task. At the same time, it happens transformation of existing images and creation of new images, in accordance with new data. Figurative thinking uses operations recognition, selection, formation, transformation and generalization the content of the reflection of the figurative form. Both the theoretical conceptual and theoretical figurative thinking complement each other, allowing a person perceive surrounding reality fullest.

Practical types of thinking are directly related to the perception of the surrounding reality and cannot be performed without relying on her.

Visual-figurative practical thinking operates images, presented in operative and short-term memory, image transformations are not happening. Human finds solution tasks, observing objects about objects, but not touching them.

Visual and effective practical thinking directly associated with transformative activities carried out with real mi items. AT process such thinking process solutions tasks is carried out with the help of real, physical transformations of the situation, objects, property testing.

There is an opinion that o theoretical thinking is more perfect than practical, and conceptual is a higher level of development than figurative, that is, types of thinking are perceived and - mayut as the levels of its development. However, we are convinced that all types thinking is closely related to each other, with the emergence of new forms thinking old forms not disappear they persist and are developing. For the formation of a full-fledged theoretical thinking, it is necessary the condition is the formation and development of all forms of thinking, starting with visual and effective.

Many psychologists studied process education concepts at child (L.S. Vygotsky [6], D.N. Bogoyavlensky [5], V.V. Davydov [10], 3. I. Kalmykov [13], and a number of others). The researchers were interested in two questions. First, in what difference concepts child from concepts adult human, t. e. in how them originality? And secondly, scientists sought to establish how it is necessary form concepts at children in educational work. Consider only some general conclusions from these research. psychologists It was established, what mastery concepts children starts with accumulation experience, Peculiarities logical thinking junior schoolchildren

Human must reason, analyze and get tired in - make the necessary connections mentally, select and apply to the given context specific task known to him suitable rules, techniques, actions. He must compare and establish the desired connections, group different and distinguish similar, and all this is carried out only by means of mental action."

OK. Quiet o worlds in his work "Psychology of thinking" defines logical thinking, as reasoning, theoretical thinking, characterized by the use of concepts, logical constructions, with existing and functioning on the basis of language, linguistic means. The author also calls it "analytical thinking, which is deployed in time, has clearly defined stages, is largely represented in consciousness most thinking human [12].

Boolean thinking suggests Availability at child capabilities to perform basic logical operations: generalization, analysis, comparison, classification.

The most important mental operations in the learning process are analysis and synthesis [9]. Analysis involves the selection of elements given object, his signs and properties _ _ _ On the first stage junior schoolchildren single out only separate parts and properties of the subject, that is, can only do partial analysis. Then, the ability to analyze all the properties of an object is formed, but without establishing relationships between them. And only after that is the younger student able to analyze all the properties and features of an object and establish a mutual connection between them.

Synthesis is a combination of various elements and sides of an object into a single

whole. In the mental activity of students, analysis and synthesis complement each other, since analysis is carried out through synthesis, a synthesis through analysis [10].

Generalization is the selection of the main features of objects or phenomena and their properties. Features of generalization of younger students are in allocation most notable external signs items.

Generalization proceeds in close unity with specification. assimilation concepts, laws, rules occurs on the basis of consideration of individual objects, facts, signs, schemes and performing specific actions with them. Assimilated concepts, laws, rules are applied to the solution of private specific tasks. So in the process learning mathematics generalization used in the formulation of mathematical rules, revealing the law of - dimensions.

Concretization is a mental transition from more general to less general, from the general to the singular. The process of specifying the opposite wives processes abstraction and generalizations.

Education specification in educational process understood in volume sense, what teacher must teach students confirm general provisions of mathematics with specific examples. For example, from a permutation terms, the sum does not change: $4 + 2$ is equal to $2 + 4$, since both of these sums are equal to 6.

Thus, comparison is a logical action by which installed similarities or differences signs objects. For formation this actions can use algorithm comparisons:

1. Define objects comparisons.
2. Name sign comparisons.
3. Select the essential features comparison object (if significant signs not known then analyze and define them).
4. match significant signs at comparable objects.
5. Define differences at general sign Name _ general and distinctive significant signs. K.D.Ushinsky [12] argued that without comparison there is no understanding, and without understanding No judgments that's why necessary wide apply this reception.

By the third class, thinking passes into a qualitatively new one, ruyu stage, requiring the teacher to demonstrate in detail the connections, existing between the individual elements of the studied material. In that period children assimilate generic ratios between individual signs of concepts, they form an analytic-synthetic type of de-activity, mastering the action of modeling. It defines the start formation verbal-logical thinking.

The formation of the logical thinking of younger students is an important part of the pedagogical process. Help students to fully to the extent to show their abilities, develop initiative, independence, creativity is one of the main tasks of the modern school [2, p. ten]. Already in elementary school, students must master the basic elements - logical operations (comparison, generalization, classification, analysis, etc.), which will allow them to further provide evidence, build inferences, statements, logically related to each other, to do conclusions, substantiating their judgments, and, ultimately, independently to get knowledge. Mathematics is exactly the subject where you can more b- to the highest degree to implement it [1, p. 32]. Many researchers point out that purposeful work on the development of logical thinking of younger students should be systematic (E.V. Veselovskaya, HER. Ostanina, A.A. Joiner, L.M. Friedman and others). At the same time, research psychologists (P.Ya. Galperin, V.V. Davydov, L.V. Zankov, A.A. Lyublinskaya, D.B. Elkonin and others) allow us to conclude that the effectiveness process development logical thinking junior schoolchildren depends on the way of organizing special developmental work [3, p. 234]. AT the works of these authors prove that as a result, the body and - vocational education, younger students quickly acquire the skills of logical thinking. At the same time, a unified approach to solving this issue, how to organize such

education, in the moment no.

Thinking is divided on the three kind and presented: clearly o- efficient thinking, visual-figurative thinking and verbally- logical thinking.

The development of mental activity of a child of primary school age It has their peculiarities and determined regular change stages in which each previous prepares the next. FROM the emergence of new forms of thinking, the old forms do not disappear, they persist and are developing.

School education built so the way what verbal o- logical thinking takes precedence. If at first a lot of attention is paid to working with visual samples, then starting from the third grade, the volume of this kind of occupation is sharply reduced. The figurative beginning loses its need for educational activity. _ Children master the techniques of mental activity, acquire e - melt the ability to act in the mind and analyze the process of their own reasoning.

Numerous studies have shown what exactly is in the initial school are laid basics evidence thinking. Here home purpose of the work on development logical, abstract thinking consists that children master the techniques of logical thinking, learn draw conclusions from those judgments that are offered to them as initial ones, so that they can confine themselves to the content of these judgments, not attracting others knowledge. The purpose of our work was to develop a special program, and in its as part of a set of tasks and exercises for the development of logical thinking younger schoolchildren using theoretical and methodological ski foundations of the educational process. The tasks were solved through theoretical and empirical methods. The collection, analysis, synthesis, comparison and summarizing the material.

Thinking, as one of the cognitive processes, is inherent in everyone to a person. A well-developed ability to think correctly is not the last factor in the success of teaching various subjects. In general, the ability to "think right" is usually understood as the ability to analyze, build judgments on the basis of the analysis carried out in compliance with cause-and-effect relationships, logic, correctness (consistency) of judgments. The studies carried out show that Not all children have this skill to the fullest.

It was found that thinking it is a mediated and generalized process of cognition (reflection) of the surrounding world. Thinking reflects: general and essential properties objects and phenomena, including those properties that are not perceptible directly, essential relationships and regular connections between items and phenomena.

Thinking is divided on the three kind and presented: clearly o- efficient thinking, visual-figurative thinking and verbally- logical thinking. Development mental activities child primary school age has its own characteristics and is determined by regular change of stages, in which each previous one prepares subsequent. With the emergence of new forms of thinking, the old forms do not disappear they are saved and develop.

School education built so the way what verbal o- logical thinking gets priority development.

The result of its implementation was to be an increase in the level of logical e - the thinking of the younger schoolchildren.

Conducted experimental study to determine the effectiveness of the developed program for the development of logical thinking junior schoolchildren showed good performance in solving assigned tasks. Based on a comparative analysis of the results of the ascertaining and control stages of the study, we can say that development program contributes to the improvement of results and increase general level development of logical thinking.

AT progress research were made conclusions:

1.Primary school age is the most important stage of development visual-figurative and logical thinking, during which the foundations for the implementation of logical

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operations of analysis are laid, synthesis, generalizations, restrictions, classification, comparisons, an abstraction and others being basic successful mastering educational program general education schools.

2. The main age features that characterize the performance of logical operations in junior schoolchildren, relate:

- predominance of the sensual, active on a concrete and abstract;
- implementation of synthesis mainly in a visual situation without separation from action with items;
- pursuit to substitution operations comparisons of objects, connections and relations between objects and their properties, replacement of essential features by their bright external signs.

3. The thinking of students must be developed in the indicated sequence and - validity of view of, timing the beginning of active actions according to development of different kinds of thinking by the age when they first start appear in children.

4. Given the development of thinking in students, in lessons of mathematics in elementary grades, it is advisable to also include elements of the game, elements of entertainment, on the lessons necessary use a lot of visual material.

5. Required purposeful work on learning in junior schoolchildren the main methods of mental operations, which will promote development of logical thinking.

6. Diagnostics and timely correction of thinking in junior schoolchildren will be promote more successful development of reception -

development of logical thinking (comparison, generalization, classification, analysis).

7. Developed program, directed on the development of logical thinking until a high efficiency.

Analysis of the results allows us to conclude that the purpose of the study, set in the introduction has been achieved, and the program developed during the study for the development of logical thinking of younger students has turned out effectively.