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**The Role Of Logical Thinking In The Preparation Of Future Teachers For Professional Pedagogical Activity**

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| **CC License**  CC-BY-NC-SA 4.0 | ***Abstract:***  *This article presents the pedagogical foundations of the formation of logical thinking in the educational process. In particular, the importance of logical thinking in the preparation of future teachers for professional pedagogical activity is highlighted based on theoretical sources. Based on the theoretical analysis, the pedagogical and psychological aspects of the use of logical assignments by future teachers were analyzed.*  ***Keywords:*** *professional pedagogical activity, educational process, logical thinking, pedagogical-psychological factor, pedagogical technologies.* |

**Introduction**

Wider use of modern pedagogical and psychological approaches in the diagnosis of logical thinking competencies and thinking styles of future teachers in the world, further development of future teachers' ability to effectively organize the lesson process based on the laws of logic, as well as successful work with logical operations and prove the results, the ability to work quickly with new concepts, the experience of drawing conclusions based on the data, the ability to develop tasks based on the laws of induction and deduction, the ability to identify logical errors in thinking, the experience of creative approach to the problem, the science The knowledge of the logical structure, the ability to compare and classify the system of knowledge, learning through modern pedagogical technologies is still being studied as an urgent problem by the Afghan public. At the same time, an expert assessment of the diagnostic possibilities of pedagogical developments, describing the technologies of teaching future teachers to think logically, further improving the technological model of forming logical thinking in future teachers, pedagogical, psychological exercises and issues that teach logical thinking attention is being paid to scientific research such as the development of types and their systematization, at the level of individual reforms.

**Methodology**

It is known that the reflection of environmental information is considered a characteristic of all living organisms, but among them, humanity is cosidered the only creature capable of a higher form of knowledge and thinking. That is, a person is not just a reflection, but a great breed with the skills of logical, creative, creative, effective thinking, analyzing situations, making logical judgments in conflicting situations, understanding cause and effect, and making rational decisions in problematic situations. is considered These abilities are not given to a person from birth, but are formed through pedagogical processes such as study, mastering, and education. Logical thinking is a type of thinking, the essence of which is the process of concepts, conclusions based on the laws of logic, comparing them and comparing the problem with specific actions. For example, a child develops vision and guesswork by looking at the environment. Or it is impossible to know the surrounding world without thinking. That is why thinking, logical thinking and its formation are considered one of the most interesting and important topics for the sciences of pedagogy and psychology. Until now, science has its own theoretical foundations for the issues of logical thinking, most of which are considered pedagogical-psychological research. Pedagogical scientists A. Ya. Komensky, I. AGalkina, P. G. Lubochnikov, N. S. Omelchenko, A. Z. Zak, Yu. M. Kolyagin, L. M. Likhtarnikov, L. G. Peterson, D. Poya, G. I. Saransev, L. M. If Friedman's scientific research is recognized, and among the psychological researchers, L.S. Vygotsky, P. Ya. Galperin, V.V. Davidov, L.V. Zankov, N.B. Istomina, R.S. Nemov, L. Yu. Ogerchuk, N.F. Talyzina, O.K. Tikhomirov, Yu.N. Kulyutkina, N.V. Kuzmina, A.M. Matyushkina's research is more recognized [1,59-60]. Therefore, in most studies, the problem of "logical thinking" is widely studied in the framework of approaches that are considered important for both disciplines.

The famous Russian psychologist S.L. As Rubinstein noted: "Through thinking, a person compares situations, distinguishes mutual relationships, understands the connections between events, and thereby has the opportunity to understand the nature of environmental events in a deeper way [2,78]. So the thought process is continuous. It arose when a person faced a problem, when he was engaged in a task that he had not faced before. If a person does not have enough experience in solving tasks, if the previously used tools and methods are not suitable for solving the problem, he understands that it is necessary to look for and use other methods that are not similar to the previous ones. According to this approach, experience, acquired knowledge and skills are one of the conditions that ensure logical thinking. According to researcher J. Dewey, any thought process that leads to a conclusion is logical. According to the author, the conclusion is not just a process, in order to reach a conclusion, a concept is defined, its characteristics and peculiarities are confirmed based on judgment, and finally a conclusion is reached. Logical thinking is a form of thinking in the form of concepts, judgments and conclusions in accordance with the rules and laws that are consciously developed and implemented with its help [3,85]. Among others, P. G. Lyubochnikov defines logical thinking as concepts, considerations, conclusions based on logical laws. That is, mental processes related to processing, comparison and connecting them with actions or causal laws are recognized as a set of logical, reliable actions or thinking operations[4,37]. The same definition was given by M.Yu. It can be found in the dictionary "Modern educational process: basic concepts and terms" published by Oleshkov and V.M. Uvarov. According to the authors, logical thinking is a type of thinking that involves working with concepts, judgments and conclusions, and it is considered the most difficult cognitive process unique to humans. Logical thinking develops gradually from a young age. When solving a problem, each person makes a conclusion based on information about an object or event with the help of reasoning. Also, the author divided the way to solve the problem into four stages [5,63]:

1. The emergence of difficulty, contradiction, question or problem;

2. Create a hypothesis, proposal or project to solve the problem;

3. Implementing a solution to the problem;

4. Check the success of the decision through experience, and then evaluate it, etc. In fact, logical thinking gives the student a wide range of opportunities, such as self-development, regulation of relationships, exchange of ideas, debates. L.S. Vygotsky emphasizes that the development of logical thinking depends on the level of speech development. The author distinguishes three stages of the formation of logical thinking[6,110-112]:

1. Syncretic combination of many objects defined by one word;

2. Complex concepts;

3. Clear concepts. That is, he says that it is possible to control the development of consciousness by teaching and developing the meaning and general level of words from a young age. Among others, A.A. Lublinskaya, while studying the process of logical thinking, notes that the process of self-development takes place in it. The author was able to distinguish two forms in children's speech[7,182]:

- speech showing an emotional reaction to the situation - "speech-play";

- Establishing connections and relationships that are not yet conscious or directed speech - in the form of "speech-question".

According to the rule, with the beginning of schooling, children acquire a system of concepts representing relationships and learn the rules of logical thinking. In general, the ability to think logically develops only if the educational material is organized taking into account the age characteristics of children. Every teacher should always direct children to think and study, this can be achieved by systematic organization of the educational process, wide use of opportunities that can properly develop the logical ability of the child in the lesson.

**Discussion and results**

An appropriate set of logical knowledge and skills is considered as the content of logical literacy. The development of students' logical literacy occurs spontaneously, that is, in the process of studying various subjects without a special plan and system, in the framework of appropriate courses that provide for the study of logic in a controlled, specially organized, purposeful way. possible Several methods were used in the implementation of the research. In particular, the questionnaire "Five factors for evaluating the level of logical thinking" developed by Yaroslav Isaykin and the questionnaires "Thinking speed and flexibility of thinking" were used.

**Table 1 Level of thinking flexibility of students of NSPI, KSPI AND SSU Kattakorgan branch**

|  |  |  |  |
| --- | --- | --- | --- |
| The degree of flexibility of thinking | Talabalarda | | |
| NSPI Students | KSPI Students | SSU Kattakorgan branch |
| High | 64% | 52% | 41% |
| Medium | 28% | 24% | 27% |
| Lower | 8% | 24% | 32% |

Analyzing studies of student thinking development, it can be seen that thinking flexibility is a much needed but understudied component. From the obtained results, it can be observed that the results of the questionnaire on the level of thinking flexibility of the students studying at the Navoi and Kokan State Pedagogical Institutes and the Samarkand State University Kattakorgan Branch are higher in the students of the Navoi and Kokan State Pedagogical Institutes than in Samarkand. showed lower in the students of the Kattakurgan branch of the state university.

**Table 1 NSPI, KSPI and SSU The level of thinking speed of students of the Kattakurgan branch**

|  |  |  |  |
| --- | --- | --- | --- |
| Level of thinking speed | In students | | |
| NSPI Students | KSPI Students | SSU Kattakorgan branch |
| High | 71% | 63% | 58% |
| Medium | 18% | 20% | 16% |
| Lower | 11% | 17% | 26% |

The method of determining the speed of thinking allows to determine the speed of execution of orientational and operational components of thinking. This method can be carried out both individually and in groups. Through the speed of thinking, a person performs intellectual tasks using the choice method, that is, by removing the wrong option when finding the right answer. Through the ability of flexibility, a person solves intellectual tasks using the transformation of abstract objects (words, images) and finds new associative links between abstract objects.

The results of the questionnaire on the speed of thinking, the results of the questionnaire on the level of flexibility of thinking of students studying at Navoi and Kokan State Pedagogical Institutes and Samarkand State University Kattakorgan branch Navoi and Kokan State Pedagogical Institute higher among the students of the institutes, and lower among the students of the Kattakorgan branch of the Samarkand State University.

**Table 3 Indicators of the level of logical thinking questionnaire (by Student's t-test)**

| **Shkalalar** | **Groups** | **M** | **Standard Deviation (Sigma)** | **t-statistics** |
| --- | --- | --- | --- | --- |
| Observability skills | Experimental group | 7 | 5,2 | 5,11\* |
| Control group | 5 | 4,5 |
| Experience and skills | Experimental group | 6 | 5,8 | 4,25\* |
| Control group | 4 | 3,3 |
| Ability to act with awareness | Experimental group | 5 | 4,2 | 13,65 |
| Control group | 5 | 4,1 |
| Indifference to one's inner experiences | Experimental group | 4 | 3,6 | 8,24 |
| Control group | 3 | 2,5 |
| Relying on their own experience | Experimental group | 6 | 5,8 | 3,34\*\* |
| Control group | 3 | 2,9 |

**Note: \*р≤0,05**

According to the results of the research, according to the survey on the level of logical thinking of future teachers, the indicators of students studying at the Navoi and Kokan State Pedagogical Institutes and the Kattakurgan Branch of the Samarkand State University according to the first scale, that is, observational qualification M (7-5), and sigma, (5.2-4.5) differences between each other. The next scale showed M (6-4) and sigma (5.8-3.3) for experience and skill.

The results of the experimental and control group test subjects on the scale of the ability to act with awareness were M (5-5), and the sigma difference was (4.2-4.1) levels. Logical thinking is the essence of human perfection, through which every person realizes his place in society and determines the meaning of his life. The next scale showed a higher than average level with differences of M (4-3) and sigma (3.6-2.5). The results of the testers based on their experience on the last scale are characterized by M (6-3), and sigma (5.8-2.9).

**Table 4 Indicators of the questionnaire of thinking speed and thinking flexibility and locus of control level (according to Student's t-test)**

| **Shkalalar** | **Groups** | **M** | **Standard Deviation (Sigma)** | **t-statistics** |
| --- | --- | --- | --- | --- |
| External locus of control | Experimental group | 14 | 12,25 | 2,84\*\*\* |
| Control group | 22 | 19,14 |
| Internal locus of control | Experimental group | 22,28 | 20,84 | 3,54\*\* |
| Control group | 16,15 | 14,65 |
| Speed of thought | Experimental group | 24,70 | 23,25 | 4,64\* |
| Control group | 18,38 | 16,35 |
| Flexibility of thinking | Experimental group | 22,90 | 18,21 | 4,49\* |
| Control group | 17,56 | 15,94 |

**Note: \*р≤0,05**

Improving the technology of formation of logical thinking in future teachers shows that the indicators of the questionnaires of thinking speed and flexibility of thinking and the level of locus of control are 14-22 on the first scale, that is, external locus of control, and the level of significance (2 ,84\*\*\*) was a high indicator with the amount. The next scale internal locus of control was 22.28-16.15, and the difference (3.54\*\*) was above average. The scale of thinking speed was 24.70-18.38 degrees, the mutual difference (4.64\*) reflected the average result. And the last scale, flexibility of thinking, showed the average with the amount of 22.90-17.56 and the level of importance (4.49\*). Logical thinking can be described as the ability to correctly evaluate people, to correctly predict their behavior and to relate to them accordingly. A number of qualities that provide a good understanding of other people can be distinguished.

**Conclusion**

In accordance with the theoretical model (goal, process, result) of developing the logical thinking of future teachers based on the developed practical results, the implementation of innovative didactic and methodical requirements for preparing students for professional activities, the consistency of the development of their professional and pedagogical logical thinking in order to provide, the methods of selecting educational materials for general and specialized subjects and using them in the educational process were clarified. Volitional and motivational aspects, i.e., emotional stability, courage, self-confidence, independence, self-control, thinking speed, flexibility of thinking, and emotional control qualities, have been proven to be useful tools in scaling up the logical thinking of future teachers.

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