Brain Activity in the Development of Imagination in First Graders

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Abstract:

This article provides information about the importance of using brain activity methods to improve the knowledge of 1st grade students in the field of computer science and information technology, develop their imagination and is intended for their development. Brain activity helps 1st grade students improve their thinking, imagination, and creativity. Brain technology plays an important role in developing students' imagination and enhancing their self-expression. Brain activity helps students develop imagination, expression of ideas and creativity. Educational programs mention the importance of paying attention to the use of practice-oriented methods in teaching computer science, the use of interactive educational materials using brain activity methods, and the use of visual tools. These suggestions are necessary to develop students' creative and critical thinking. This study discusses the problems of brain activity (activation of the cerebral hemispheres) and the role of its implementation in the development of imagination in first-graders. The purpose of this study is to analyze the learning process and development of imagination and thinking skills, creative thinking and critical approach in first-graders. The study showed ways of brain activity and how they affect the creative thinking and imagination of first-graders, experiments and methods used to develop them.

Keywords: First grade students, brain activity, motivational need, creative thinking, critical approach, mimic method, non-standard thinking, interactive educational material, visualization, interdisciplinary integration.

Introduction (Введение).

The introduction of scientific achievements into production, including the digital economy, and intelligent robots, requires the creation of a system for training specialists capable of solving some of the problems facing humanity. What kind of professionals should they be? According to the

world community, in the future specialists must have "creative thinking" skills. So, creative thinking in the educational process is thinking that provides an understanding of the meaning of the subject being studied, an idea of the processes that will occur, and coming to a new idea and a certain conclusion. Perception provides food for the development of imagination. Information for perception is obtained from the surrounding world and the processes occurring in it.

In accordance with the order of the Minister of Preschool and School Education of the Republic of Uzbekistan dated March 15, 2023 No. 125 "On approval of the basic curriculum for secondary schools for the 2023-2024 academic year," 1st grade students will be taught "Informatics and Informatics." The goal of teaching first-graders "Computer Science and Information Technology" is to form and develop the necessary skills to train specialists who can contribute to the development of society in the era of the digital economy and who can "think creatively." It is desirable that tasks given to primary school students be related to previously solved problems.

Research Methodology (Методология исследования).

The purpose of the study was to study the methods of brain activity and how they are used in the development of the imagination of first-graders. These methods help develop students' independent thinking, identify their own opinions and improve the learning process.

The "motivational need" (i.e., the need for learning) of first grade children (6-7 years old) is much greater, and it is important to effectively use this opportunity (the available reserve). As soon as children enter school, they begin to master cognitive processes and acquire adult characteristics. This indicates that new activities have begun in their lives.

To effectively use children's resources for learning, you need to pay attention to the following two important issues.

1. Teach productive ways of learning, being mindful and attentive. To do this, classes must be interesting, organized through various games and constantly arouse the interest of students.

2. The biggest problem in primary school education is raising children with unequal basic knowledge and different behavior. This requires a great ability from the teacher to mentally equalize the students.

The abilities of first-graders in the field of cognition (information perception, memory storage, imagination, thinking and speech) increase rapidly. This has become their main activity: learning, communication, various games and work play an important role. Their attention is not inferior to that of adults. If different games are used in training, you can increase their interest in learning and, of course, attention. Schoolchildren also have good memory, especially mechanical memory, and in the early years it develops much faster. But since the need is less, logical memory skills are low. If memetic techniques are used from the early years of education, it will improve their logical memory. Teaching children memetic methods should consist of two stages:

➢ in the first, students master ways of memorizing and reproducing information;

➢ in the second, they learn to use them as a means of memorization in different situations.

Primary school students also have great potential in terms of thinking. In students of the first and second grades, visual and visual-symbolic (role-playing) thinking predominates, and in the third and fourth grades, verbal-logical and symbolic thinking predominates. The main source of intellectual activity of children of this age is their natural curiosity. They are characterized by a desire to deepen their knowledge. At the same time, the relationship between memory and thinking changes in these children of this age. Because the principle of "think and remember" is suitable for primary school students. The process of memorizing them consists of thinking, establishing logical connections

between memorized information and recalling information using these connections. It is advisable to use these features in the formation and development of "creative thinking" skills.

The brain has not changed significantly in recent human history. But with its help, modern technologies were created that provided access to alien planets, great discoveries were made, and human life expectancy was doubled. What changed then? The way the human brain receives and processes information has changed. Thus, a person's ability to learn and think has changed.

Results and Discussions (Результаты и обсуждения).

When you do great things, your brain's energy consumption increases. The brain controls our thinking, memory, speech, limb movements and the functioning of all organs of our body. For example, let's get acquainted with the physiology of the memory process.

Memory consists of four processes:

a) Memorization (or encoding) - all received information is encoded. From a physiological point of view, encoding is the transformation of external energies to our senses into specific electromagnetic field energy and electromagnetic waves, i.e. signals. And these signals move along neural fibers;

b) Storage. The better the information is encoded, the better it is stored in memory. Typically, information obtained through reasoning and understanding its meaning is well retained in memory. From this point of view, data visualization is important;

c) Retrieval (remembering) - If new information is compatible with information existing in the brain, the brain assimilates it at the same moment, comparing it with previous ones. If it does not match, then the trace of neurons formed in the first moments of receiving information will change;

d) Forgetting. The final stage of processing received information is forgetting. The brain sorts information by importance. Some are ignored and we quickly forget them. [1]

The brain can store between 3 and 1000 terabytes of data. The 900-year history of the British National Archives occupies just 70 terabytes.

A person always strives for perfection, that is, to think deeply, strengthen his memory, make his body healthy and beautiful. They are associated with improved brain activity.

The brain is divided into two hemispheres: left and right [2]. They are connected by a bundle of fibers (packaging material) that transfers data from one side to the other. Also, each hemisphere is divided into 4 parts, which divide it into parts: forehead, temple, crown and back of the head. They are responsible for the following activities:

➤ forehead – speech, movement, complex thinking;

➤ temporal part – hearing and smell;

➤ upper part – sensation and taste;

➤ occipital part – interprets vision (color, light, movement).

The most complex information processing processes occur in the cerebral cortex.

Although humans have many sensory channels, since ancient times we have been talking about five senses that mainly receive information from the external world: sight, hearing, smell, touch and taste. Sense organs begin with cells that record signals.

The brain begins to process visual information, that is, analyze it, 300 ms (milliseconds) before "creative thinking." So, before "creative thinking" begins, the brain analyzes new and pre-existing information.

When creative thinking begins, there is a sharp activation in the right temporal region of the brain (above the ear). This part is responsible for communication with the elements of space and time. So, the combination of previously existing information and new information leads to the birth of new ideas.

To activate both hemispheres of children's brains, you can use folk tales, folk sports games, folklore, "mind maps" and improve their "creative thinking."

During the process of "creative thinking," connections are made between brain cells. This is how special "intellectual connections" are created in the brain, i.e., a private internal "intellectual map".[3]
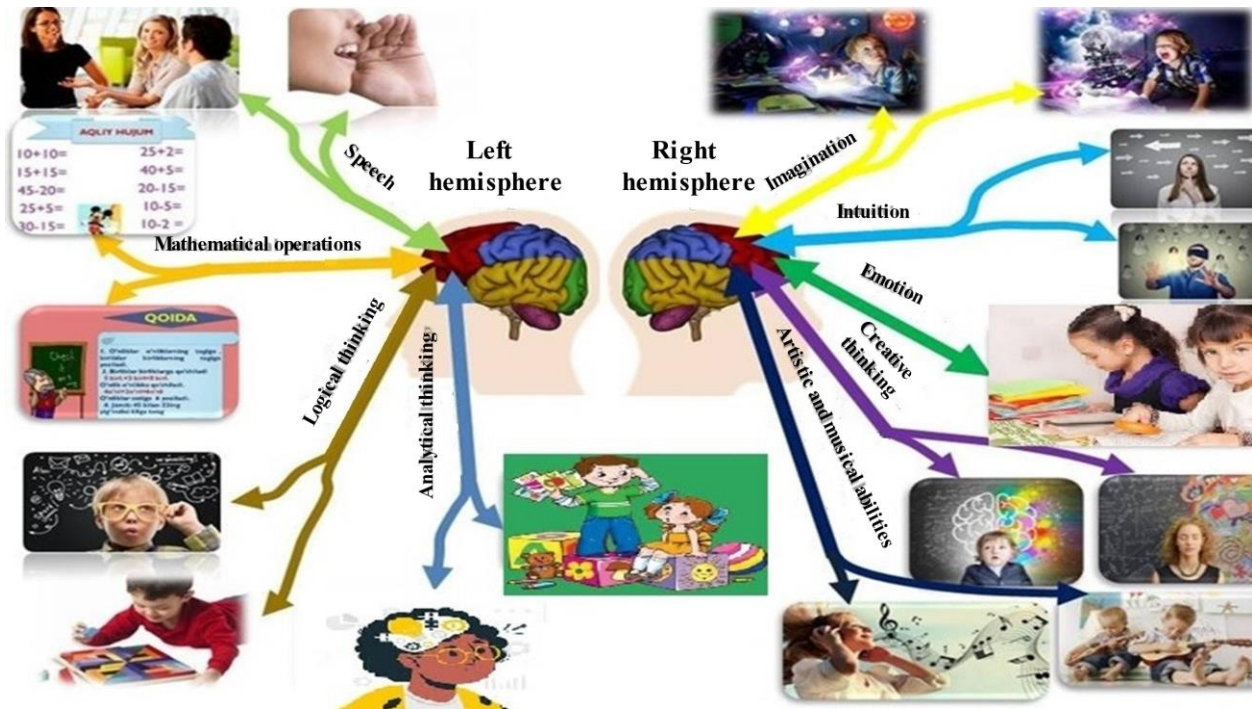

Figure 1. Intellectual map of the cerebral hemispheres by specialty.

The most ideal situation is the same active development of the cerebral hemispheres. The following examples are good proof of this:

➢ if the left hemisphere of the brain is actively involved in musical education, then the creation of a musical work, born under the influence of different imaginations, is a product of the right hemisphere [4];

➢ when a poet writes a poem, he uses the right hemisphere to make comparisons and search for elements of fantasy, and the left hemisphere serves to quickly describe these feelings using words;

➢ When an architect draws the outline of a building, he uses the right hemisphere to determine its spatial location and aesthetic appearance. But all calculations are made using the left hemisphere (Fig. 1).

According to experts, from the age of five, the hemispheres of a child's brain begin to divide into "specializations." The ability to learn a language plays an important role in this. So, you can start

teaching the elements of "creative thinking" to children as early as five years old. A. Einstein's interest in science began at the age of 5, when his father showed him a compass. He also enjoyed playing the violin. [5]

According to Sperry Roger's "discovery of the cerebral hemisphere's connection to specialization," imagination and "lateral thinking" are products of the right hemisphere of the brain.[6]

Activation of the right hemisphere of the brain, coordination of the activities of both hemispheres allows you to develop "creative thinking" skills and increase brain productivity. The cerebral cortex ensures the interaction of both hemispheres. The joint activity of the left and right hemispheres, that is, joint thinking of the brain, is called holistic brain thinking [7].

S. L. Hoffert, in his research work, studied the role of students in the process of self-expression and self-understanding, considered the importance of brain activity, self-regulation of students, the development of opinions and social skills, its goals and useful methods.[8]

Brain activity plays an important role in the development of students' imagination and activates the process of their self-expression. KJ Pretty-Fronczak noted the importance of supporting student freedom and interest in the learning process.

D. G. Singer and J. H. Goldstein noted that it is important to develop students' brain activity, abilities to read, imagine and think creatively, as well as to demonstrate and regulate their abilities by imagining and acting out the proposed problems.[10]

In his article S.A. Seider examined how students' imagination and story creation influence their cognitive and developmental processes and indicated that they are important for the development of self-expression and opinion, as well as the methods used in intellectual development.[11]

The opinions presented in this literature show the importance of brain activity methods in developing the imagination of students and the importance of their application in practice:

Student development. As a result of the use of brain activity techniques, the social, personal and intellectual development of students is enhanced through the development of opinions, imagination and expression through dramatic play.

Development of imagination. Using brain activity techniques, students develop thinking and imagination skills.

Relations with students. Brainstorming techniques are important for building relationships with students, improving their performance by expressing their opinions, collaborating through group work, and sharing ideas with others.

Figure 2. Activity of the right and left hemispheres of the brain.

In conclusion, it is important to note that teaching computer science will help develop the imagination of students through effective and practice-oriented methods designed for their growth and development. Brain activity is a very effective way to develop the imagination of first graders, helping to increase their imagination, expression of ideas and creativity. When teaching a first-grader "Computer Science and Information Technology", it is important to use practice-oriented lessons, games and interactive educational materials.

Based on the above conclusions, the following suggestions can be made:

➢ It is advisable to pay attention to the use of practice-oriented methods of teaching computer science in educational programs. Because it plays an important role in students' acquisition of practical knowledge and development of their imagination.

➢ Students should be given additional time to use brainstorming techniques and learn programming languages. This is necessary to develop their creative and critical thinking.

➢ Electronic educational resources should be organized so that students can use interactive learning materials and use visual tools.

➢ It is necessary to emphasize the importance of a personal approach and receiving guidance for the development of students in the field of computer science. This will help them achieve their personal goals and develop independently.

Conclusion/Recommendations (Выводы и рекомендации).

In conclusion, it is important to help develop students' imaginations through effective and practice-oriented computer science teaching methods designed for their growth and development. Brain activity is a very effective way to develop the imagination of first graders, helping to increase their imagination, expression of ideas and creativity. When teaching "Informatics and Informatics" to a first-grader, it is important to use practice-oriented lessons, games and interactive educational materials.

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➢ Electronic educational tools should be organized so that students can use interactive learning materials and use visual tools.

➢ The importance of personal approach and guidance should be conveyed to the development of students in the field of computer science. This will help them achieve their personal goals and develop independently.

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