

**THE ROLE OF HAND-MOTOR EXERCISES IN THE DEVELOPMENT OF
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Abstract: In this article, the role of the sensory system in increasing the intellectual potential of elementary school students is analyzed based on the observations and lessons given by pedagogues, methodologists, psychologists, and neuropsychologists. The article also mentions that the parallel development of the cerebral hemispheres through hand-motor skills of elementary school students has a positive effect on the development of their cognitive abilities. In addition, in expanding the scope of interaction of mental processes such as perception, attention, and memory, skin reflection was proposed as a solution to the problems of attention and memory of students, and special suggestions were also developed for using hand-motor exercises related to skin sensors in the primary education lesson processes.

Key words: sensory system, cognitive ability, perception, attention, memory, cerebral hemispheres, attention deficit, skin reflex, hand-motor exercises.

INTRODUCTION

The development of cognitive abilities for primary school students is one of the main goals of education. In particular, the Law on the “Xalq ta’lim tizimini 2030-yilgacha rivojlantirish konsepsiyasi”¹ first of all mentions raising the spiritual, moral and intellectual development of the younger generation to a qualitatively new level, introducing innovative forms and methods of education into the educational process. Among the problems in the field of organizing the educational process listed in the concept, special emphasis is placed on the development of students' mental activities, which increases its importance and relevance.

In addition:

- it is required to form a strong motivation for learning in students;
- Despite the fact that state educational standards are based on a competency-based approach, teaching and assessment methods, as well as textbooks and other educational materials, are mainly focused on memorizing and presenting information, which hinders the development of critical thinking, independent information search and analysis skills, and other competencies.

Also, the National Curriculum “2022-2026-yillarda xalq ta’lim tizimini rivojlantirish”² includes the introduction and popularization of modern methodologies that encourage students to be intellectually and cognitively active in the teaching process and the implementation of such methods as a measure. The above-mentioned points include the ability of students to think, understand, logically analyze and make decisions. This is directly related to the methodology

¹ O‘zbekiston Respublikasi Xalq ta’limi tizimini 2030-yilgacha rivojlantirish konsepsiyasini tasdiqlash to‘g‘risidagi 2019-yil 29-aprel, PF-5712-son qarori.

² 2022 — 2026-yillarda xalq ta’limini rivojlantirish bo‘yicha milliy dastur 2022-yil 11-may, PF-134-son

for organizing cognitive activity in an interesting way, on this basis, it is envisaged to use hand-motor exercises (using skin reflexes) through specially developed methods in order to increase the mental activity of primary school students. Hand-motor exercises, in turn, stimulate brain activity, in particular, strengthen the connection between specific brain movements and cognitive processes.

From the point of view of pedagogy and psychology, hand-motor exercises have a positive effect on the emotional, psychological and cognitive development of children. These processes help to increase students' ability to work independently, build self-control and self-confidence. At the same time, combining manual motor exercises with various pedagogical methods for primary school students helps to effectively develop their cognitive abilities. This methodology is important in ensuring the comprehensive development of students, allowing students to learn through movement, which increases their interest in learning.

Students test themselves more in practice, which makes the learning process more interactive. In addition, manual motor exercises encourage students to concentrate, perform their work more accurately and carefully. These processes help develop students' memory and imagination, as they activate the brain to perform each movement correctly, allowing elementary school students to develop motor skills and cognitive abilities at the same time. Such exercises include skills such as mathematical tasks and writing, problem solving, drawing, placing shapes, distinguishing colors and shapes, and writing words and letters. The parallel use of attention, memory, and imagination by students in using their hands and performing various exercises encourages them to think consciously and actively.

LITERATURES REVIEW

Scientists have conducted various approaches and scientific research on the topic "Methodology for developing cognitive abilities of primary school students through manual motor exercises." This topic includes the fields of psychology, pedagogy and neurophysiology, and several scientists have created scientific developments in this area. Many psychologists and educators have linked the development of cognitive abilities with motor skills. For example, such famous scientists as Jean Piaget and Lev Vygotsky have emphasized the role of motor skills in the cognitive development of children. Piaget, in particular, showed that children strive to understand the world through motor movements and the importance of the sensorimotor phase in this process. Lev Vygotsky, in his theory of social development, considered the interaction of physical movements and their connection with society to be important in the process of reading and learning. According to him, it is important for students to act on the basis of interaction and experience in the development of their cognitive abilities.

Research in the fields of neurophysiology and neuropsychology has shown a link between manual dexterity and cognitive processes. Scientists such as Adele Diamond have studied the relationship between motor and cognitive skills and explained how motor exercises affect brain function. She has also noted that motor exercises help children develop attention, working memory, and other cognitive functions. Eric Kandel and other neurophysiologists have found in their work that motor activity is associated with changes in brain structures. The symbiotic relationship between cognitive abilities and motor actions affects brain growth and development.

DISCUSSION

Various pedagogical studies and experiments show the importance of manual motor exercises in developing attention, memory, and imagination in primary school students. Educators consider the use of these exercises in teaching mathematical and linguistic skills to be successful. With the help of such exercises, students learn more practically and effectively, which contributes to their cognitive development.

In recent years, new research on the relationship between manual motor exercises and cognitive development has been ongoing. New pedagogical approaches, in particular, teaching by combining students' motor activities with digital and interactive technologies, have been shown to be effective in developing students' cognitive abilities.

Although scientific research on this topic is well developed, more research is still needed on some of its aspects, in particular on the effectiveness of practical approaches and methodologies in primary education. It is also necessary to further improve the methods for measuring and evaluating the impact of manual motor exercises on cognitive development. Therefore, the topic is relevant, studies on it are ongoing, and changes and innovations can still be introduced in this area. This issue creates great opportunities for increasing the effectiveness of the methodologies used in the educational process.

Experts have long emphasized that satisfying the student's cognitive needs in an educational situation plays an important role in his development. If a student is given the opportunity to succeed in an educational situation, he will be able to choose the right path for himself in life. Didactics are trying to substantiate in every possible way that creating a learning situation creates broad opportunities for the development of the student's cognitive activity. If the student strives to know, feels the need to learn, healthy inclinations and interests are formed in them, and they succeed in the process of learning. The joy of knowing, creating, and communicating that arises in the student is the main factor that increases his interest in the learning process.

Sensation is related to perception, but before perceiving a thing or phenomenon, it is necessary to perceive it, therefore sensations are the result of the effect of matter on our sensory organs. It receives, selects, accumulates sensory information, receives and processes the flow of information every second, and delivers it to the brain. As a result, an adequate reflection of the surrounding external world and the organism's internal state is formed. The sensory organs are one of the ways through which the external world enters the human mind.

In the educational process, favorable conditions should be created for the development of voluntary, stable, strong, active conscious attention in younger school-age students. In the process of cognition, voluntary, conscious attention is formed through independent mental activity, solving examples, problems, performing didactic exercises, and repetition. In 7-8-year-old children, the skills of voluntarily concentrating, distributing, and consciously controlling attention are formed. In order to turn this skill into a skill, it is necessary to perform regular manual motor exercises.

RESULTS

Below, we will look at the cognitive skills that are important for human development by analyzing the cognitive process from different angles.³ Cognition covers the main areas of child development, including memory, motor skills, visual and spatial understanding, perception, and language skills. When children participate in creative arts activities, their cognitive skills develop in several areas.

³ Learning through creative arts training manual guide - 1

Practicing creative arts activates multiple cognitive functions at once, because they are multimodal learning activities that require students to use different parts of their bodies and minds at the same time. Visual arts activities are an effective way for children to learn about colors and shapes. Art activities are a great way to engage children in basic subjects. For example, when children complete a leaf observation task - they use magnifying glasses to study the veins on a leaf, which helps them understand the process of photosynthesis in science class.

Observational learning also provides opportunities for children to record their thoughts, ask questions, and reflect—all essential skills that children need to become more capable learners. If the learning environment encourages creative exploration and play, it helps children imagine, discover, and understand the world independently. Group play and exploration are also beneficial because they facilitate “facilitated” learning—meaning that less able children develop by learning skills from a more capable child or adult. This is often observed when young children are involved in creative arts activities.

When participating in dance activities, a child is learning kinesthetically. Kinesthetic learning (learning through physical activity) requires the learner to perform movement through thought, which helps develop their cognitive learning skills. One of the most effective ways to help a child remember information is to put it to a song – especially to a song melody that they are already familiar with. Songs have long been used to teach the alphabet, as well as numbers and other basic materials. When you combine an educational song with a dance activity, memories are reinforced, thereby developing cognitive skills.

Cognitive Skills:

Creative Thinking. Creative thinking is the ability to use your senses to create new ideas or images that do not already exist. Creative thinking can be used to create something new or original, or to solve problems. This can be achieved through structured and unstructured methods.

Critical Thinking. Critical thinking is the ability to analyze and evaluate a problem, which in turn informs decision-making.

Hand-Eye Coordination. Hand-Eye Coordination involves controlling eye movements in conjunction with hand movements and using visual information to control the hands.

Language. Language is a way of communicating with others, and can be verbal, written, or visual (pictured).

Listening. Listening is the ability to pay attention to, effectively understand, and interpret what is being said.

Logical thinking. Logical thinking is the process of analyzing information and taking rational steps to draw conclusions.

Observation. Observation is the process of carefully observing or monitoring an object, place, or person.

Problem solving. Problem solving is the process of finding a solution to a problem or issue.

Sensory perception. Sensory perception is the neurophysiological processing of stimuli. It involves responding to all of the "senses": touch, hearing, sight, taste, etc.

SUMMARY

In conclusion, various pedagogical studies and experiments show the importance of manual motor exercises in developing attention, memory, and imagination in primary school students. Educators consider the use of these exercises in teaching mathematical and linguistic skills to

be successful. With the help of such exercises, students learn more practically and effectively, which contributes to their cognitive development.

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