

USING MULTISENSORY TEACHING METHODS IN EARLY DEVELOPMENT OF CHILDREN WITH DISABILITIES

Liudmyla Mashuta

Master's Degree in Special Education, USA

Abstract

This article examines the specifics of using multisensory methods in the context of the early development system for children with disabilities. It analyzes scientifically based approaches to organizing the educational process that take into account the neuropsychological, sensory and cognitive characteristics of this category of children. Particular attention is paid to the integration of auditory, visual, tactile and kinesthetic stimuli as a key factor in the formation of stable intermodal connections. The importance of this approach for effective assimilation of information in the context of both inclusive and correctional education is emphasized.

Keywords: Children with disabilities, multisensory learning, early development, inclusion, neuropsychology, pedagogy.

Introduction

The scientific novelty of the article lies in the comprehensive analysis of the multisensory approach to teaching children with disabilities at an early stage of development. For the first time, forms and methods of influencing various sensory channels are systematized, taking into account the peculiarities of perception in children with different nosologies. A classification of effective practical forms of multisensory learning is presented and pedagogical conditions for their successful application are substantiated. The novelty also lies in the integration of data from neuropsychology, defectology and pedagogy to create an adaptive educational environment that promotes the cognitive and emotional development of children with disabilities.

Early ontogenesis is a significant stage for the development of cognitive, emotional and sensorimotor functions. During this period, the basic mechanisms of learning, speech development, cognitive activity and communication skills are formed. In children with disabilities, these processes can be significantly hampered due to various disorders (sensory, motor, speech, intellectual), which requires the development of specialized approaches to organizing the educational process. The emphasis should be on the child's compensatory resources and the activation of all sensory channels of perception [1].

One of the most effective directions in this context is recognized as a multisensory approach, based on the simultaneous stimulation of several analyzer systems (visual, auditory, tactile, olfactory, motor). According to neuropsychological studies, parallel impact on various sensory systems contributes to the accelerated formation of inter-analyzer connections and an increase

in the level of information assimilation, which is especially important for children with special needs [2].

Modern pedagogical and correctional practices actively integrate multisensory methods into the early intervention system. In the context of inclusive education, the multisensory approach not only stimulates cognitive activity, but also contributes to the formation of positive learning motivation, reducing anxiety and increasing the child's self-esteem [3]. Moreover, these methods ensure the creation of an accessible educational environment adapted to the individual characteristics of perception and information processing by each child.

Against the background of the active development of neuropsychology, sensory integration and digital technologies, there is a need for scientific substantiation and systematization of multisensory learning methods, in particular, in the field of early assistance to children with disabilities. Despite the confirmed effectiveness of these methods in a number of studies, the scientific literature still lacks a unified conceptual apparatus and a clear classification of multisensory strategies applicable to various categories of disabilities in childhood.

The purpose of this article is to analyze the theoretical foundations and practical aspects of the use of multisensory teaching methods in the early development of children with disabilities, to determine the pedagogical principles of their implementation and to reveal the potential of these methods within the framework of inclusive and correctional pedagogy.

From a scientific point of view, the concept of multisensory is based on the provisions of cognitive psychology and neuropsychology. According to the theory of A.R. Luria, the formation of higher mental functions is determined by the interaction of various cortical zones, including sensory and motor areas. He emphasized the need to create conditions that stimulate the active functioning of several analyzers for the full development of the child [4]. The involvement of various sensory channels potentiates the strengthening of neural connections and the formation of intermodal associations, which is critically important in developmental disorders.

The concept of multisensory learning closely correlates with the ideas of M. Montessori, who was the first to propose the use of sensory teaching materials (including those with a variety of textures, colors, and shapes) for teaching children with special educational needs. Her approach emphasized the importance of sensory experience as a foundation for learning and cognition [5].

It is also worth noting the contribution of J. Piaget to understanding the role of the sensorimotor stage of development, at which the child learns about the world through direct interaction with objects. According to his theory, it is sensorimotor activity that forms the basis for further intellectual development [6].

Modern research in the field of sensory integration (A. Jean Ayres and her followers) has demonstrated that sensory modulation disorders can lead to delays in the development of speech, motor skills, attention and emotional regulation. Sensory therapy programs based on the principles of multisensory have proven their effectiveness in corrective work with children with autism spectrum disorders (ASD), mental retardation (MR), cerebral palsy (CP) and other forms of disabilities [7].

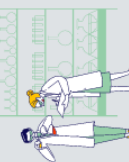


Table 1 – Pedagogical and neuropsychological effects of using multisensory methods in teaching children with disabilities

No.	The effect of multisensory approach	Description
1	Activation of different parts of the brain	Simultaneous stimulation of visual, auditory and motor areas promotes knowledge acquisition
2	Increased attention and concentration	Using a variety of stimuli keeps the student interested and helps them focus.
3	Compensation for sensory impairments	The load on weakened analyzers is reduced by strengthening other sensory channels
4	Formation of an accessible educational environment	Provides comfort for children with different sensory sensitivities

Thus, the multisensory approach to teaching is positioned not as a private methodological technique, but as a holistic pedagogical concept integrating neurophysiological, psychological, pedagogical and individual characteristics of a child's development. The theoretical justification allows us to conclude that multichannel perception is a key mechanism for the effective assimilation of information in children with disabilities, especially in early ontogenesis.

Early childhood (from birth to 6–7 years) is characterized by intensive sensorimotor and cognitive development. During this period, the basic structures of perception, memory, thinking, speech, and the emotional-volitional sphere are formed. In children with disabilities, these processes may be impaired or slowed down due to organic or functional developmental features. In this regard, multisensory learning is of particular importance at this stage, since it allows activating the child's compensatory resources and using alternative channels of perception.

Multisensory learning at an early age should take into account the following psychological and pedagogical characteristics of children with disabilities:

1. Underdevelopment of one or more analyzers, which requires stimulation of the remaining sensory systems.
2. Slowing down the pace of information processing, as a result of which the importance of clarity, repetition and simplicity of presentation of the material increases.
3. Low level of voluntary attention and memory, compensated by the inclusion of play, emotionally charged and motor-active forms of learning.
4. A decrease in motivation for learning, often associated with failure in standard conditions, which requires a special approach aimed at creating a situation of success [8].

A fundamental aspect of the implementation of the multisensory approach is the individualization of the educational route. This approach should be built taking into account the diagnosis, psychophysical condition, sensory profile and individual characteristics of the perception of each child. For example, for children with hearing impairments, the emphasis shifts to visual-tactile stimuli, while with visual impairments, priority is given to auditory and kinesthetic effects.

No less significant is the formation of a holistic sensory experience, in which the perception of an object is accompanied by the parallel activation of several analyzers. This contributes to the formation of stable inter-analyzer connections, which, in turn, optimizes the processes of memorization, understanding and active use of newly acquired knowledge and skills.

To improve the effectiveness of early learning, the following strategies are recommended:

Table 2 – Recommendations for organizing multisensory learning at an early age for children with disabilities

No.	Recommendation	Explanation
1	Use of sensor modules and materials	The use of bright objects with varied textures, sounds and smells activates perception
2	Introduction of physical activity	Including movements and object play stimulates motor-sensory coordination
3	Ensuring repeatability of stimuli	Repeated presentation of material in different forms promotes memorization and assimilation
4	Encouraging all forms of feedback	Taking into account the child's responses (gestures, facial expressions, sounds) allows for individual adaptation of training
5	Application of emotional positive reinforcement	Reduce anxiety and build motivation through friendly support

Therefore, the key feature of early multisensory learning is the creation of such an educational environment in which each child with disabilities has the opportunity to make maximum use of available perception channels to acquire knowledge and form key life competencies. This not only promotes cognitive development, but also has a positive effect on the emotional-personal sphere, socialization and increasing the child's self-esteem.

The introduction of a multisensory approach into the practice of teaching children with disabilities requires careful selection of adequate forms, methods and didactic materials that take into account the individual characteristics of the perception and development of each child. The main goal is to simultaneously engage several sensory channels (vision, hearing, touch, smell, kinesthetics) to form stronger neural connections and stable ideas about the surrounding reality [7].

Table 3 – Main forms of multisensory learning in the early development of children with disabilities

No.	A form of multisensory learning	Basic sensory impact	Purpose and effect of application	Recommended for people with disabilities
1	Sensory boxes and panels	Tactile, visual	Development of fine motor skills, tactile perception, research interest	Sensory integration disorders, mental retardation, ASD
2	Sand and light therapy	Tactile, visual	Relieving anxiety, speech development, attention, role-playing game	Speech disorders, ASD, mental retardation
3	Musical and movement exercises	Auditory, kinesthetic	Development of motor skills, auditory perception, rhythm and emotions	Cerebral palsy, autism, hearing impairment
4	Art and aromatherapy	Visual, tactile, olfactory	Developing imagination, reducing anxiety, developing self-expression	Behavior disorders, anxiety, ASD
5	Interactive sensory technologies	Visual, auditory, tactile	Individualization of tasks, increasing motivation, development of cognitive skills	All categories of disabilities

Practical forms of multisensory learning should integrate play, emotionally charged and sensory active activities, providing both educational and therapeutic effects. Their use contributes to the comprehensive development of the child, the formation of basic skills and an increase in the quality of life.

The multisensory approach has proven itself to be one of the most effective methods of early pedagogical intervention for children with disabilities. Its key feature is the simultaneous involvement of several analytical systems - visual, auditory, tactile, kinesthetic and olfactory. This contributes to a more solid assimilation of information and the development of basic cognitive and communication skills [9].

Research shows that the use of multisensory techniques in children with disabilities leads to improved memory, attention, speech activity and motor coordination. Thus, children with speech development disorders show better results when combining audiovisual and tactile stimuli: the synergistic effect of sound, image and touch activates interhemispheric connections, facilitating the launch of speech activity [10].

In addition, the multisensory approach helps reduce anxiety and emotional stress, which is especially important for children with autism spectrum disorders or hyperactivity syndrome. Emotionally positive reinforcement and the ability to orientate oneself in space create a safe learning environment for the child. Such methods increase the child's involvement in the process, form positive motivation and trust in the adult, especially when working in a playful manner.

An important aspect of the effectiveness of the multisensory approach is its ability to compensate for the shortcomings of the leading analyzers by strengthening secondary channels of perception. For example, in the case of hearing impairment, the active use of visual-tactile methods allows for the formation of alternative communication skills and the development of lexical and grammatical structures through visual images and gestural forms [11].

In general, multisensory learning ensures the holistic development of the child, forming not only academic knowledge, but also adaptive behavior, social skills and emotional stability. In the context of inclusive education, this approach is considered as a tool for implementing an individual educational route that corresponds to the capabilities and needs of each child.

Multisensory teaching methods are an effective tool in the early development system for children with disabilities, allowing for the maximum realization of the child's compensatory capabilities and the creation of conditions for the harmonious development of the personality. In the context of modern correctional pedagogy and inclusive education, it is necessary to more widely implement the multisensory approach, integrating it with individual development routes and interdisciplinary support.

REFERENCES

1. Vygotsky L. S. Problems of development of the psyche. - M.: Pedagogy, 1983. - 328 p.
2. Smirnova E. O. Sensory development of young children. - M.: Mosaic-Synthesis, 2020. - 144 p.
3. Tkachenko T. A. Inclusive education: theory and practice.- M.: Akademkniga, 2021.-256 p.
4. Luria A. R. Fundamentals of Neuropsychology.- M.:Moscow State University, 1973.-512 p.
5. Montessori M. Help me do it myself. - M.: Education, 2017. - 240 p.
6. Piaget J. Psychology of intelligence. - St. Petersburg: Piter, 2001. - 240 p.
7. Ayres A. Jean. Sensory Integration and the Child. - Los Angeles: Western Psychological Services, 2005. - 211 p.
8. Zhukova O. M. Psychological and pedagogical support for children with disabilities. - M.: Vlados, 2019. - 208 p.
9. Bityutskaya T. V. Multisensory development of children with disabilities: theory and practice. - M.: Logoped-Profi, 2022. - 180 p.
10. Kobyakova I. L. Integration of sensory channels in speech development in preschoolers // Defectology. - 2021. - No. 3. - P. 21–26.
11. Petrushina E. A. Emotional component of the multisensory approach in working with children with ASD // Inclusive education. - 2019. - No. 4. - P. 33–37.