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ОСОБЕННОСТИ СОДЕРЖАНИЯ УЧЕБНОЙ ПРОГРАММЫ В РОССИИ В НАЧАЛЬНОЙ ШКОЛЕ ДЛЯ ДЕТЕЙ С ОСОБЫМИ ПОТРЕБНОСТЯМИ: ОБЗОРНОЕ ИССЛЕДОВАНИЕ©

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Аннотация. Детям с особыми потребностями обычно требуются альтернативные способы доступа к учебным материалам или мероприятиям для их понимания. В статье представлен систематический обзор литературы, приводится анализ различных нарушений, которые мешают детям полноценно успевать обучаться в классе. Даны рекомендации для учителей и приведены особенности создания учебной программы для младших школьников с дисграфией, дислексией, дискалькулией, афазией и алалией.

Ключевые слова: дети с особыми потребностями; типы расстройств; методы обучения; стратегии обучения; дислексия; дискалькулия; дисграфия; афазия; алалия.

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Specifics of shaping the curriculum for primary school children in Russia with special needs: systematic review©

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Abstract. Children with special needs usually require alternative ways to access and understand learning materials or activities. This article presents a systematic literature review, analysing different learning disorders that prevent children from fully performing in the classroom. The recommendations for teachers and the specifics of creating a curriculum for primary school children with dysgraphia, dyslexia, dyscalculia, aphasia and alalia are given.

Keywords: children with special needs; disorder types; methods of education; teaching strategies; dyslexia; dyscalculia; dysgraphia; aphasia; alalia.

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Introduction

One of the reasons for academic underachievement may be defined as a primary disorder of learning. In such cases, a learning disorder may trigger the children's academic underperformance at school. Early diagnosis and detection of many pathologies are crucial for the proper education of children at school. The number of children with speech impairments has recently risen. Early diagnosis and detection of various pathologies are in the first place for successful education of children at school [Odom, Buysse, 2011].

Speech therapy is available in many Russian primary schools. Correction is a key step in the education and raising of children with special needs. Correction is a set of psychological and pedagogical interventions aiming at correcting, weakening, or smoothing the mental development of disabled children. This can include both the treatment of particular defects and a holistic influence on the child's personality in order to obtain a positive outcome in the process of correcting educational work [Котова, Граничина, Савинова, 2007].

This current issue is relevant since the number of children suffering from a learning disability reaches 10% in Russia. Every year, the number of children with special needs increases and thus, the quality of education is deteriorating [Бондаренко, 2021]. In this regard, this issue requires in-depth analysis and the search for workable solutions.

The *aim* of our study is to identify the features of creating a curriculum for elementary school students in Russian schools with such learning disorders as dysgraphia, dyslexia, dyscalculia, aphasia and alalia.

To implement this aim, we have defined the following *objectives*:

- to consider dyslexia as one of disorder types, which manifests in the inability in acquiring reading skills;
- to learn about dyscalculia as an impairment associated with the limited maths abilities;
- to define dysgraphia as a deficiency in the ability to write;
- to consider the notion of aphasia and alalia as speech disorders;
- to analyse the specifics of the studying process and the curriculum for pupils with learning disabilities of each type.

Dyslexia

The most widely accepted definition of dyslexia is that proposed by R.I. Lalaeva, as it takes into account the well-established scientific understanding of the nature of this disorder and its manifestations: "Dyslexia is a partial disorder of the process of mastering reading, manifested in numerous repeated errors of a persistent nature, caused by the lack of mental functions involved in the process of mastering reading" [Лалаева, 1983].

Dyslexia is a barrier to learning for 2–10% of pupils in mainstream schools and up to 50% of pupils in auxiliary schools. Difficulties in learning particular subjects are the most common cause of school maladaptation and a sharp decline in learning motivation. Among these, reading and writing disorders are the most common. It is worth noting that when learning a foreign language, it is quite common for reading skills to be formed before oral language skills are mastered [Корнев, 1997].

O.M. Sterz concludes that children with writing and reading disorders have a reduced level of development of phonemic hearing, which significantly affects the sound-letter analysis of word composition and

errors related to the mixing of acoustic and articulatory similarity of letters. Correction of reading and writing disorders should be based on a comprehensive approach and include not only the correction of specific errors committed by the child in reading and writing, but also work on the development of cognitive processes, mental stability of personality (e.g., self-regulation skills). This work on cognitive processes such as attention and memory will also help to reduce the number of specific writing errors associated with missing and inserted letters and words in reading and writing in dyslexic children [Штерц, 2021].

Speech therapy for dyslexia focuses on all aspects of oral and non-verbal processes. According to G.V. Chirkina, the correction of reading disorders involves the following directions: (1) the development of phonemic, morphological and syntactic generalizations can be carried out in the main moments according to the same scheme as when eliminating writing disorders; (2) the development of mental functions necessary for mastering the skill of reading; (3) the formation of reading operations [Чиркина, 2007].

It is very important for a specialist to follow certain principles of work on dyslexia [Лалаева, 2019]:

1) the principle of comprehensiveness, according to which speech therapy work on dyslexia is based on the impact on the whole spectrum of speech disorders;

2) the pathogenesis principle, which states that the methods of logopedic work to be used in the course of corrective and developmental sessions must be aimed at overcoming the main mechanism of the speech disorder;

3) the principle of symptomatology and severity of dyslexia: the work of a speech therapist should take into account the severity of the symptomatology, severity of the disability as well as the stage at which the child is currently learning to read;

4) the principle of the workaround, which is based on the theory of functional systems;

5) the principle of gradual forming of mental actions according to which corrective work should be based on gradually forming of skills which support reading development;

6) the principle of gradual complication of tasks and speech material: first the child is given simple tasks, and then their complexity gradually increases in accordance with the “zone of the proximal development”;

7) the principle of consistency states that dyslexia correction is a system of methods and techniques that are aimed at overcoming the main defect;

8) the ontogenetic principle implies taking into account the sequence in the formation of speech functions that takes place in ontogenesis.

In order to determine the strategy and content of the remedial work, it is important to take into account the errors that are specific to the given reading disorder. There are a number of persistent, repeated, specific errors in reading: skipping letters or adding new sounds when reading, substitutions at word level, re-reading a word or skipping it, adding other words while reading. V.A. Antokhina and T.V. Galkovskaya give examples of types of logopedic corrective and developmental exercises, including [Антохина, Галковская, 2021]:

- exercises aimed at developing phonemic perception, sound analysis and synthesis: identifying a sound in the background of a word, determining the number of sounds in a word, identifying words in a sentence and establishing their sequence;
- exercises aimed at forming ideas about the morphemic structure of a word, the ability to perform morphemic and lexical analysis of a word;
- tasks aimed at correction of mnemastic dyslexia, at development of graphomotor functions, auditory and verbal memory, at enrichment of pupils' vocabulary: to form a letter out of small objects (buttons, beads, string, etc.), or to choose items which are necessary for writing a letter;
- exercises aimed at developing operations of synthesis and understanding of the meaning of the read: read a word, find its image from the pictures and the corresponding inscription on it, read a text with a missing letter;
- tasks aimed at distinguishing mixed letters when reading, at developing optical perception, recognizing letters, at increasing the volume of visual memory, etc.: to add elements of letters, to read letters in the text which are underdrawn.

Dyscalculia

The ability to count is a fundamental skill to live, get an education and master a profession. An essential role in the organisation of the counting process belongs to the parietal and parietal-occipital cortex of

the left hemisphere [The role of right…, 2009]. When these areas of the brain are affected, there are disturbances in the perception of spatial relationships and orientation in space. Disabilities in the mastery of counting operations in children are defined by the term "dyscalculia".

Dyscalculia in children is a specific, complex and persistent disability in the mastery of counting operations, which negatively affects the school adaptation of the child, the formation of his personality, and in general, the acquisition of mathematical knowledge [Dyscalculia: what we … , 2020].

It is centred around the disability to interpret numeric symbols and arithmetical operations like adding, subtracting, multiplication, and division. A child that suffers from dyscalculia will confuse numbers and signs, and cannot do mental maths or work with abstract ideas.

The following types of dyscalculia are usually distinguished [Yoong, Noor Aini Ahmad, 2021].

- Verbal dyscalculia manifests itself in disability of the verbal designation of mathematical concepts. With verbal dyscalculia, computational operations can be successfully performed, but at the same time the child is unable to name numbers, symbols, quantities, concepts.
- Apraxic dyscalculia manifests itself in disorders of the number system of specific and visual objects or their symbols. With this type of dyscalculia, children are unable to count objects or divide them into groups according to shape, size, spatial characteristics.
- Dyslexic dyscalculia manifests itself in violation of reading mathematical signs, verbal designation of mathematical concepts, in violation of perception of colour, shape, magnitude, quantity, spatial perception, visual and auditory memory.
- Graphic dyscalculia manifests itself in violation of the recording of mathematical signs or symbols and the correct reproduction of geometric shapes. Also, graphic dyscalculia is characterised by the inability of the child to correlate the presented digit with its graphic symbol.
- Operational dyscalculia is associated with the inability to perform mathematical operations. With operational dyscalculia, the solutions of mathematical problems found are erroneous or, if the solutions are correct, are random.

Some scientists propose systems of measures for the formation of measuring competencies, consisting of the formation of spatial representations, the development of the hand – eye coordination, the perception of

magnitude [Haberstroh, Schulte-Körne, 2019]. Measurement training begins with the use of conditional measurements, which makes measurement accessible to young children.

In practical activities, the teacher teaches children to measure the length of the room in large and small steps; the number of cereals with glasses, spoons; water with a jar, a mug. The approach is also focused on the formation of written speech (the ability to write down mathematical symbols, solve calculations) [Lahrichi, 2019]. The researchers emphasise that in order to master the mechanism of writing, a child needs to make a basic discovery – you can draw not only things, but also speech, i.e., letters, numbers, signs, figures [Dyscalculia: what we … , 2020]. That is, mathematical skills turn out to be secondary to writing skills (which we observe in practice).

Thus, at the primary school age, children with disabilities should receive adequate correctional and speech therapy assistance, otherwise there is a high risk of secondary developmental disorders, including mathematical ones. The structure of such assistance includes special diagnostic methods for studying cognitive and verbal functions. At the same time, mathematics is positioned as a component of exploration of the surrounding world as a whole.

Dysgraphia

The number of young students diagnosed with dyslexia or dysgraphia is growing [Воропаева, 2019]. Dyslexia can be caused by a child's developmental disability (birth trauma) as well as by a speech impairment, which means that the child is unable to distinguish similar utterances and the speech is perceived incorrectly [Воропаева, 2019]. The teacher's speech for such children is unclear, which makes reading and writing particularly difficult. The difficulty also lies in the fact that the child not only has to hear the sound correctly, but also has to be able to transcribe it. This is why dysgraphia is almost always one of the consequences of dyslexia.

Dysgraphia is a disorder which is researched by speech therapy. It is understood as a partial writing disorder manifested by persistent, repetitive errors, which are involved in the writing process, due to a lack of higher mental functions development [Сибарова, Султанбаева, 2022]. According to the statistics, dysgraphia affects 12% of the

world's population, and in Russian schools it affects more than 30% of students [Сибарова, Султанбаева, 2022]. The significance of identifying dysgraphia is that writing disorder is one of the most common forms of speech impairment among primary schools' students [Русинова, 2021].

The written speech is a speech that has a graphically organised shape which is based on letters. Writing disorders hinder successful learning at school, effective social adaptation in the future. According to the experts, such disorders can cause further disorders connected with mental development, delayed speech development, and can often cause the child's personality deviations [Русинова, 2021]. In addition to impairment of the mental functions and communication functions, dysgraphia can lead to difficulties in learning grammar and orthography, and in learning the rules of the native language.

It is important to mention the types of dysgraphia that Russian scholars identify [Седова, Ворсобина, 2021]:

- articulatory-acoustic dysgraphia manifests itself in the mispronunciation of speech sounds;
- acoustic dysgraphia is based on impaired phonemic recognition (phoneme differentiation); letter substitutions are a kind of mistakes that are widespread if a student is diagnosed with an acoustic dysgraphia;
- a dysgraphia that is connected with the violation of various forms of language analysis and synthesis;
- if children have such an underdevelopment, they will distort the structure of words and sentences in writing;
- agrammatical dysgraphia manifests itself in the lack of formation of the lexico-grammatical structure of speech, the norms of agreement, incorrect use of prepositional case structures, replacement of endings, suffixes, prefixes;
- optical dysgraphia is an underdevelopment of visual gnosis, visual mnemesis, visual analysis and synthesis, as well as spatial perceptions;
- the substitution of letters that look similar in writing.

Thus, the variety of identified kinds of dysgraphia has to be addressed. It is important to improve pronunciation, phonemic listening skill, optical-spatial perceptions and motor skills. In order to correct mistakes in writing, the scholars propose differentiation of letters indicating voiced / deaf sounds, elimination of vowel omissions, and clarification of the number of letter elements [Воропаева, 2019].

Moreover, the students with dysgraphia need exercises such as crossing out letters in the text; writing small dictations with a pencil in order for them to have an opportunity to erase their mistakes and write words correctly; exercises on attention and observation; building logical chains [Воропаева, 2019]. It is also of utmost importance to find an appropriate font to make the texts easier and more convenient for the children to read [Дмитриева, 2020]. The experiments that have been conducted recently at Russian primary schools state that didactic games have a positive impact on the students' educational achievement. The didactic games comprised "Gather word groups", "Charades", "Reconcile quarrels", "Puzzles", or "Scattered sentence" by means of which the average writing level increased by 20–25% [Дмитриева, 2020].

Aphasia and Alalia

Serious speech disorders are a diagnosis that necessitates a long and thorough approach. Speech disorders can be congenital or inborn (alalia) and acquired (aphasia). Alalia is a violation of speech development as a result of unformed speech function in the cerebral cortex that develops due to organic brain damage [Логопедия, 1998]. Aphasia is an acquired neurogenic language disorder resulting from an injury to a specific area of the brain [Задержка речевого … , 2017]. According to statistics alalia and aphasia occur in 0,1% of the population; boys are two times more likely to be diagnosed with speech disorders than girls [Логопедия, 1998]. Aphasia and alalia in children manifest in the systemic disorders of speech functions (phonetics, grammar, lexis, oral and written speech, speech perception) [Кузнецов, 2015]. Persistent impairment of the ability to speak leads the child to lose the ability to perform many social functions and, thus, needs an urgent process of rehabilitation [Рейх, 2017].

The signs of the violation are the following [Кязымова, 2016]:

- a child cannot understand speech, or it is difficult for him / her to understand it;
- a child cannot build complex sentences;
- there is a problem with repeating spoken words;
- pronunciation worsens, writing disorders appear;
- a child confuses the names of objects or people;
- deterioration of fine motor skills.

Some scholars believe that for effective lessons with children with speech impairments, it is essential to rely on the main sensory system of the child or on a more developed channel of perception of information: visual, auditory, kinesthetic [Артемова, Малахова, 2014]. Such a differentiated approach to each child allows to achieve better results in the process of learning, helps in communication, and group activities. Usage of the predominant sensory channel of a child can also help a teacher in predicting the reaction of a child to new information and a process of communication as a whole [Артемова, Малахова, 2014].

Other scientists suggest that teaching children with aphasia or alalia should be multisensory, therefore all three channels of perception should be involved [Мурашова, Нодельман, 2020]. The method of applying the multisensory mode involves the use of techniques that combine the auditory perception of the teacher's explanations with the visual perception of the material and reinforcement with subject-practical actions (tactile-kinesthetic aspect of information analysis). All verbal explanations of the teacher must be accompanied by some visual materials and active gesticulation. If it is possible the tactile channel should also be involved, allowing children to perceive the shape, weight, temperature and other qualities of the object. The multisensory method is considered as universal and the most inclusive one since it can be applied to all categories of children with and without disabilities [Мурашова, Нодельман, 2020].

If the implementation of all sensory channels in the educational process seems impossible, teachers should concentrate on the audiovisual approaches. Inclusion of audiovisual approaches in lessons is one of the most effective ways to restore speech of patients suffering from aphasia and alalia [Константинова, 2021]. The audiovisual approach is a teaching method that involves multiple hearing and pronunciation of language structures and speech models, resulting in the automation of gained skills during the learning process. Active usage of gestures and mimics also contributes to the stimulation of speech [Константинова, 2021]. Paying more attention to mathematics among other subjects helps children with the development of verbal and logical thinking, an enrichment of the vocabulary, the development of the grammatical structure of speech along with the assimilation of the basic material [Айтхожаева, Избасарова, 2013]. When teaching vocabulary children should be provided with written words, definitions, synonyms

and antonyms, examples of usage and pictorial representations. For better understanding it is paramount to break concepts down into small steps, practice simple language and unsophisticated sentences and repeat them as often as necessary to ensure the children are able to comprehend them fully [Wangchuck Tshering Pema, 2016].

The development of fine motor skills is also of great importance for schoolchildren as they are connected with the development of speech, since the brain centres responsible for motor skills and speech are located nearby [Калугина, 2016]. Scientists have proved that the motor impulses of the fingers can have a positive effect on the cerebral cortex of the child. Motor skills can be improved by different actions: massage of hands and fingers; clay modelling; colouring; shading; stroking of shapes and other finger games [Кязымова, 2016].

Conclusion

In this systematic review of scholarly papers on the topics of dysgraphia, dyslexia, dyscalculia, aphasia and alalia were analysed and various ways to supplement the curriculum in accordance with the disorders that prevent the student from fully performing in the studying group were given.

We defined the common approaches to all types of learning disorders such as: creating a communicative environment; using of various educational materials and tasks, suitable for each type of student with this or that disorder; simplifying the task instructions.

As a result, we would like to conclude that depending on what kind of impairment a child has, it is worth adjusting the program and modifying the curriculum in a certain way and adding such teaching methods that will facilitate the student's learning process and will be characteristic of the specifics of his or her development.

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