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## ORGANIZATION OF NETWORK INTERACTION IN THE EDUCATIONAL ACTIVITIES OF ELEMENTARY SCHOOL STUDENTS WITH DYSGRAFIA IN ENGLISH LESSONS

ORGANIZACIÓN DE LA INTERACCIÓN EN RED EN LAS ACTIVIDADES EDUCATIVAS DE LOS ESTUDIANTES DE ESCUELA PRIMARIA CON DISGRAFÍA EN LAS LECCIONES DE INGLÉS

Maryam Koreneva<sup>1</sup>

E-mail: [maryam.r.koreneva@mail.ru](mailto:maryam.r.koreneva@mail.ru)

ORCID: <https://orcid.org/0000-0002-2942-5243>

Konstantin Yadrov<sup>1</sup>

E-mail: [yadrov@inbox.ru](mailto:yadrov@inbox.ru)

ORCID: <https://orcid.org/0000-0002-4297-2268>

Victor Vittenbek<sup>1</sup>

E-mail: [v.vittenbek@mail.ru](mailto:v.vittenbek@mail.ru)

ORCID: <https://orcid.org/0000-0003-1467-8886>

Galina Ivanova<sup>1</sup>

E-mail: [ivgp@mail.ru](mailto:ivgp@mail.ru)

ORCID: <https://orcid.org/0000-0001-6429-1335>

Marina Bryantseva<sup>2</sup>

E-mail: [mv.bryantseva@mgou.ru](mailto:mv.bryantseva@mgou.ru)

ORCID: <https://orcid.org/0000-0002-4751-5883>

Svetlana Poruchkina<sup>1</sup>

E-mail: [sm.poruchkina@mgou.ru](mailto:sm.poruchkina@mgou.ru)

ORCID: <https://orcid.org/0009-0001-0784-0251>

<sup>1</sup> The State University of Education, Russia.

<sup>2</sup> The State University of Education, Russia; International Academy of Pedagogical Education Sciences, Russia.

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### ABSTRACT

The relevance of the research problem relates to the need to renew the content of professional training of English teachers and educational psychologists for working with children with dysgraphia. Various writing disorders are observed both in writing in the native language (Russian) and in writing in English. The goal of the study is to identify the educational needs of elementary school students with writing disorders in English lessons; to develop and test an individual program of psychological and pedagogical support; to offer practical recommendations for psychological and pedagogical support during pre-letter and letter periods; to create a network map of psychological and pedagogical support in the educational process. Empirical research confirms that the use of the individual program of psychological and pedagogical support of students with dysgraphia by the teacher contributes to the correction of their issues (developing the skills of accurate coherent written expression). Materials of the article will be of interest to practicing English teachers, educational psychologists, neuropsychologists, and university teachers and students exploring the issues of specific correction of difficulties in teaching foreign languages to elementary school students with dysgraphia.

### Keywords:

Graphic skills, educational process, optical dysgraphia, psychological and pedagogical child development, writing disorder.

### RESUMEN

La relevancia del problema de investigación se relaciona con la necesidad de renovar el contenido de la formación profesional de los docentes de inglés y psicopedagogos para el trabajo con niños con disgrafía. Se observan varios trastornos de escritura tanto en la escritura en el idioma nativo (ruso) como en la escritura en inglés. El objetivo del estudio es identificar las necesidades educativas de los estudiantes de primaria con trastornos de escritura en las clases de inglés; desarrollar y probar un programa individual de apoyo psicológico y pedagógico; ofrecer recomendaciones prácticas para el apoyo psicológico y pedagógico durante los períodos de pre-carta y carta; crear un mapa de red de apoyo psicológico y pedagógico en el proceso educativo. La investigación empírica confirma que el uso del programa individual de apoyo psicológico y pedagógico de los estudiantes con disgrafía por parte del maestro contribuye a la corrección de sus problemas (desarrollando las habilidades de expresión escrita precisa y coherente). Los materiales del artículo serán de interés para profesores de inglés en ejercicio, psicólogos educativos, neuropsicólogos y profesores y estudiantes universitarios que exploren los problemas de la corrección específica de las dificultades en la enseñanza de idiomas extranjeros a estudiantes de escuela primaria con disgrafía.

### Palabras clave:

Habilidad gráfica, proceso educativo, disgrafía óptica, desarrollo psicopedagógico infantil, trastorno de la escritura.

## INTRODUCTION

Speech is the primary means of communication in the life of a modern person. It plays a vital role in personal, social, and professional interactions. Furthermore, *language* is not only a means of human communication but a *mechanism of human thinking and memory* and a *communication channel for receiving information*. At present, a part of elementary school children experience difficulties in mastering oral and written speech both in the native (Russian) language and a foreign language.

According to the Federal State Educational Standard on Elementary General Education in the Foreign Language subject area, elementary school students are expected to master all types of speech skills (listening, reading, writing, and speaking). Students' mastery of writing builds on the formation of their graphic skills, as well as their familiarization with the structure and content of a written statement.

At present, psychological and pedagogical studies have established that the number of children experiencing difficulties in learning to write (especially in a foreign language) is increasing from year to year and has its distinctive characteristics.

The main causes of writing disorders in children, as a rule, are:

- results of underdevelopment of higher mental functions (Glozman, 2019);
- disorders of visual development, which are connected with the complexity of the rapid processing of visual information (Levina, 2001; Inshakova & Inshakova, 2003; Lalaeva & Venediktova, 2003; Chirkina & Filicheva, 2005);
- phonemic process disorders (difficulties in processing the sound composition of language, which is necessary for mastering the sound side of writing) (Iastrebova et al., 1996; Efimenkova, 2011; Sadovnikova, 2012b);
- neurological disorders in a child (congenital or acquired) (Berry, 1999; Meese, 2001);
- mixed disorders (combinations of letters and syllables in a strong word position that are persistent and repetitive) (Inshakova & Inshakova, 2003).

In Russian practice, there is a great deal of research on the issue of writing disorders in children. Psychological and pedagogical and speech therapy manuals and textbooks for remedying dysgraphia in Russian have been developed. However, so far there has been no description of the complex application of *diagnostic and correctional techniques for the prevention of writing disorders in English learners*.

The theoretical and methodological foundation for this study are the works of leading scientists: the theory of the unity of consciousness and activity, the theory of the relationship of learning and development (Vygotsky, 2003), the theory of the structure of psychological and practical human activity (Leontiev, 2013; Markova, 2018), studies revealing the psychological and pedagogical features of children with language disorders and conducting scientific and methodological corrective work with them (Levina, 2001; Chirkina, 2003; Lalaeva & Venediktova, 2003; Chirkina & Filicheva, 2005), and theory of the psychological aspects of directed teaching of a foreign or second language in school age.

Today, some children have considerable difficulties in school because of their existing dysgraphia. The existing pathology has a negative impact on a child's success in school (children have no time to perform written assignments, cannot put on paper coherent thoughts or write more legibly). Since dysgraphia causes partial impairment of the writing process (as a result of the underdevelopment of higher mental functions), it leads (most often) to persisting errors (Eletskaia, 2007). In addition, a child's written language is directly related to the speaking process. Therefore, a child must have certain analyzers involved – the speech-auditory and speech analyzers. In addition, an effective method for developing a child's ability to understand the characteristics of a sound is to pronounce it out loud, which can be both loudly and in whispers. Researchers have determined that pronouncing the word is especially important because it promotes the effectiveness of writing. This implies that in elementary school, starting in the first grade, teachers need to train children to enunciate every sound when they write. This makes it clear to younger students how to distinguish sounds from each other and how to determine their characteristics and sequence in words (Eletskaia, 2007). Once the learner masters the analysis of the sound structure of a word, they can move on to training to compare the sound image with the graphic image. This helps the child understand the difference between similar sounds not only audibly, but also visually. To be able to distinguish similar letters, a student must have a high level of visual development and spatial representation. Most often, practice shows that students are not yet ready to independently perform both analysis and comparison of sounds and letters. The next writing operation is directly associated with depicting the graphic image of a letter using hand movements. This process is mechanical; an important condition for its implementation is kinesthetic control (hand movement in the process of writing). It is at this stage that the mechanical memorization of the letter occurs (the learner consolidates the memorization by visual control and subsequent reading of

the written letter). According to researchers, it should be considered that the process of mastering writing must account for the level of development of certain functions and skills in elementary school students, particularly:

- the presence of a developed visual apparatus;
- completed development of the function of spatial perceptions;
- the ability to distinguish sounds by ear;
- the ability to pronounce sounds correctly.

If any of the above is not adequately developed, students will have a type of speech impairment called dysgraphia.

It is important to note that dysgraphia in younger students has to do only with impairments in the acquisition and development of spelling skills, and not with the child's intellect.

Previous studies have confirmed that dysgraphia has at its core a deficit in the child's cognitive development, a deficit in phonological word processing, and impairments in auditory and visual word processing. The latter does not necessarily indicate that children with dysgraphia have problems with hearing or vision. Rather, due to natural differences in cognitive development, children with dysgraphia have problems processing what they hear and see.

Early identification of children at risk for specific writing difficulties in learning is crucial because the earlier remedial intervention is provided, the easier it is to overcome deficiencies.

Elementary students with a writing disorder require special assistance in the form of differentiating the tasks assigned to them; using specific approaches to learning to write; having teachers willing to give them more time than other children and helping them develop their learning strategies in English lessons for successful mastery of the written language.

Currently, there is no universal model for teaching English to children with dysgraphia. A good teacher must be able to construct a model for teaching such special children. In addition, the English teacher should systematically carry out phonological work with the younger students and teach them correct spelling (to improve its accuracy). Most students with dysgraphia enjoy talking and learning based on the repetition of rules and the ability to use them. Therefore, successful instruction for each child with dysgraphia must be tailored to their characteristics and needs.

In this connection, the goal of the present study is to establish the optimal organization of the educational process

for elementary school students with written language disorders in English lessons.

## MATERIALS AND METHODS

According to the study goal, the research objectives set are as follows:

- to identify the educational needs of elementary school students with dysgraphia in English lessons;
- to study the substantive foundations for the organization of educational activities of students with dysgraphia in English lessons;
- to develop an *individual program of psychological and pedagogical support for students with writing disorders in English lessons*;
- to develop *practical recommendations on the psychological and pedagogical support for students with dysgraphia in English lessons* for English teachers and educational psychologists;
- to create a *network map of psychological and pedagogical support for students with dysgraphia in English lessons*.

In the course of the study, we used elements of the network form of organizing educational activities of elementary school children with dysgraphia in English lessons. This form of educational activity included a variety of resources that were utilized by a team of specialists (from schools, medical and preventive healthcare (MPH) institutions, and additional education institutions).

Based on the study of scientific literature, a theoretical analysis and systematization of domestic and foreign experience on the problem of research was carried out. The research sample was formed using the following methods: pedagogical observation (the method of studying the products of learning activities); the Philippine test (on morphofunctional readiness of a child to study in school); methods of diagnosing dysgraphia ("Assessment of writing", "Assessment of the stepwise writing of letters (lower and upper case)"), conducting "Dictation in English").

In the process of working with students and establishing causal relationships of their writing disorder in (foreign) English lessons, we relied on the works of (Iastrebova et al., 1996; Lalaeva & Venediktova, 2003; Sadovnikova, 2012b).

As the basis for the joint work of specialists, we took the Federal Project "Modern School" under the national project "Education", under which by 2024, it is planned to implement 70.0% of educational programs in the network form, including correctional ones, as well as a package of normative documents, such as Federal Law of the

Russian Federation No. 273-FZ of December 29, 2012 (State Duma of the Federal Assembly of the Russian Federation, 2012); Order of the Ministry of Education of the Russian Federation of June 10, 2019, No. 286 (Ministry of Education of the Russian Federation, 2019a); Letter of the Ministry of Education and Science of the Russian Federation of August 28, 2015, No. AK-2563/05 (Ministry of Education and Science of the Russian Federation, 2015); Letter of the Ministry of Education of the Russian Federation of June 28, 2019, No. MR 81/02; Ministry of Education of the Russian Federation, 2019b).

The experimental study involved 29 students of the 4th “K” grade of the State Budgetary Educational Institution (SBEI) No. 2115 (Moscow, Russia), as well as scientific and pedagogical staff (university and school teachers).

During the learning process, psychological and pedagogical diagnostics were carried out, including:

- pedagogical observation of students (studying the products of their learning activities);
- assessment of children’s morphofunctional readiness to school (the Philippine test);
- data obtained from the English teacher.

The study was conducted in several stages.

In the first stage of the study, we determined the number of students with dysgraphia and its type, as well as the difficulties faced by them in English lessons.

In the second stage, to finally confirm the assumption of a certain type of dysgraphia, the following types of pedagogical diagnostics were conducted (Appendix 1):

1. Assessment of written language.
2. Assessment of students’ stepwise writing of the letters of the English alphabet.
3. Conducting dictation.

Proceeding from the results of the first two stages, we compiled an individual program of psychological and pedagogical support for elementary school children with dysgraphia in English lessons.

The goal of this program was to correct the identified disorders in students with dysgraphia in (foreign) English lessons and to improve the quality of their educational activities.

The objectives of support for children with written language disorders include:

- to find the most efficient forms and tools for teaching English to elementary school students with dysgraphia to reduce the existing issues;

- to test the individual program of psychological and pedagogical support for children with dysgraphia in English lessons;
- to develop practical recommendations for teachers and psychologists in education on psychological and pedagogical support for children with dysgraphia in English lessons.

Relying on the teaching kit “Spotlight”, we developed exercises and games, which were then applied in the correction of optical dysgraphia in English lessons.

### Program content (Appendix 2)

Key topics:

- Emotions and feelings.

In this topic, the students were required to give answers to tasks by molding them out of plasticine and to write vocabulary under dictation and then check it independently. Having found their mistakes, they had to correct them. It was necessary to find the letters in the words that caused difficulties for the children.

- Tell the tale.

In this section, students worked on writing short stories and reading poems. For this purpose, we utilized the following types of tasks: circling the letters that cause difficulty; inserting missing letters; writing a short story in English in the sand.

- Days to remember.

The section included exercises on fine motor skills (maze). The students enjoyed this type of task and were able to find a way for the main character to get to their destination at their own pace. In addition, the children also practiced writing words out of plasticine on the subject “Places to visit I liked best”. They were also given worksheets with all the letters of the English alphabet with the correct starting point for writing each of them.

- Place to go.

At this stage, students were offered exercises that asked them to highlight letters in the names of different countries using different colors, work with sand, as well as take dictation from the teacher.

In addition to the suggested exercises on the teaching kit topics, we also conducted exercises on the topic “What is to your left/right?” to improve children’s orientation in space. The memory of the children was also exercised during the tasks. For example, children had to discover “What letter is missing?” and write or sculpt it. The attention exercises included the task “What is an odd element in the letter?”.



All exercises involved both oral and written responses. They were performed at the right pace for the students, without pressure. When writing missing letters or highlighting them in words, the students accompanied this activity by writing out the letters first in the air and then on the sand (sometimes grits were used instead).

In the last stage of the study, to determine the efficiency of the individual program for psychological and pedagogical support of children with dysgraphia in English lessons, the control stage of the study (from January to May, 2022) was conducted.

This stage was needed to solve the following objectives:

- to find out how much the degree of optical dysgraphia has changed in the students;
- to analyze and compare the results of the control stage with the data of the ascertaining stage;
- to draw a conclusion about the effectiveness of the developed individual program for psychological and pedagogical support of children with language disorders in English lessons based on the obtained data.

The same techniques were used for the survey at the control stage as at the ascertaining stage. Only the words were changed, considering the new vocabulary learned.

## RESULTS AND DISCUSSION

Following the literature review, we determined that elementary school students with dysgraphia experience problems with handwriting, typing, and spelling. Therefore, it is important to understand what conditions the teacher should create when organizing the learning space for students with dysgraphia. Drawing on the results of the literature review, we identified common points to which teachers should pay attention when working with students with dysgraphia:

### 1. Training materials and procedures:

- it is recommended that children be given different types of pens or pencils to see what works best for a child with dysgraphia;
- if possible, additional handouts should be provided so that there is less need to copy from the board;
- the student can be given printed copies of lesson summaries and assignments to help take notes;
- extra time should be allotted for taking notes and copying information from the board;
- paper with colored or embossed lines can be prepared to help the student write the letters in the right place;

### 2. Instructions for work in the classroom:

- if a student often spends a lot of time filling in their name, date, or the name of a topic, they can be given handouts with tasks with the fields already filled in. Thus, they will not fall too far behind the pace of their classmates' work;
- a student should have help in breaking down the written assignments into steps;
- the child should be explained how each step they complete will be assessed;
- the teacher can offer the student alternatives to written answers, for example, an oral format of communication.

### 3. Completing tests and tasks:

- teachers should adapt test formats to reduce the amount of handwriting, for example, by using "circle the answer" or "fill in the blanks" formats;
- grading should be based on what the student knows, not on handwriting or spelling;
- the student should be allowed to correct the mistakes they find on their own;
- the child should also be given more time for tests and quizzes.

The teacher needs to bear in mind that one feature of students' written language is that it is formed only with the purposeful training of the child. In the process of learning to read and write, a student develops, first of all, graphic and spelling skills, which are the foundations for understanding writing (Luria, 1950).

To organize effective pedagogical and correctional influence on a younger schoolchild with dysgraphia, it is necessary to account for their age and psychological and physiological features. It is elementary school age that is the most opportune for preventing and overcoming dysgraphia.

According to L.S. Vygotsky (2003), writing is a fixation of thoughts using a certain sign system, and written language is a purposeful and creative process that improves thoughts in the written word.

In the process of teaching a child English, it is necessary to remember that their language activity is represented by:

- controlled writing (formation and development of the skill of actual writing, which consists of writing letters and words and copying sentences);
- guided writing (reproductive activity), which is performed with the support of a speech model or requires detailed instructions for performance;
- and writing itself (productive activity) (Levina, 2001).

According to researchers, new skills are formed in a young student only based on already existing skills. New dynamic stereotypes are created in the cerebral cortex of the large hemispheres and interact with the previously created ones. In the case of a positive effect of interaction on a new skill, there appears the phenomenon of skill transfer (Efimenkova & Sadovnikova, 2005).

The primary cause of difficulties in writing in a foreign language for an elementary school student is also the presence of differences in the sound and letter systems of languages (native and second language). For the same reason, students often find it difficult to match each sound with the corresponding letter or combination of letters. It is for the same reasons that the connection between the reflection of dysgraphia in the native language and a foreign language becomes evident. In primary grades, children often mix up letters as they learn to write in English. Due to the fact that children do not encounter complex structural words, it usually does not cause concern to the teacher.

From the above, it is clear that there is a need for preventive work to reduce the risk of dysgraphia in younger students (including in English lessons) (Markova, 2018), for instance, with the use of block paper, having a point in the correct starting point for writing (both for uppercase letters and numbers). Such tools can be used consistently throughout the curriculum, which ensures the consolidation of letter writing from year to year.

#### 1. Movement is the basis:

- when a child writes a letter or number, they should sound out what they are doing. The junior student can be asked the following: "Tell your pen what to do". This gives the child **additional instructions**, making them repeat the sequence of writing a letter of the English alphabet, for example: "Big line down, frog jumps up, little curve to the middle, little curve to the bottom – capital **B**." In addition, a student can begin the lesson using **air writing**. Then, using two fingers for extra touch input, the student traces the letter written on thick paper. Further effective practice can be carried out with the **Wet-Dry-Try method** (using chalk on a slate board creates a resistance that helps control the work being done, which is an important support for these children). This **method provides neurological feedback to the brain** to improve the child's memory of writing the letters of the English alphabet. Thus, the use of **kinesthetic** and **multisensory** practices when working with special children in English lessons can be considered a key strategy in the fight against dysgraphia.

#### 2. Short but effective:

- it may come as a surprise, but the fact is that just 5 to 10 minutes a day is sufficient to make a positive impact

on a student's ability to write the letters of the English alphabet fluently, legibly, and without much effort on their part. The teacher's goal is to make writing a fun way to put their thoughts on paper. Practicing penmanship leads to a mastery that makes future writing focus entirely on content rather than structure.

#### 3. Do not forget the keyboard:

- in addition to calligraphy, the keyboard is another method of writing that must be learned to keep up with the times. It is an additional method of writing, but not a replacement. Today's world demands them both. When given a longer project that includes outlines, drafts, and edited versions, a keyboard is better for a child with dysgraphia who is frustrated at the thought of having to write and rewrite so much. In this age of technology, we believe it important for children to practice both typing and writing.

#### 4. The Wet-Dry-Try method:

- as a **multi-sensory learning activity**, it teaches students proper orientation and writing of letters in the English alphabet and numbers. Students train in how to shape uppercase and lowercase letters and numbers in simple step-by-step sequences. Available tablets (either as a slate or as an app) for handwriting on an iPad allows using the Wet-Dry-Try method both at home and partially in the classroom.

Consequently, to overcome dysgraphia in younger students in English lessons, it is advisable to work on the following areas:

- development of cognitive processes in the child;
- development of phonetic hearing of the child;
- development of analysis and synthesis properties;
- development of visual analyzers and spatial concepts in the child;
- enriching the learner's vocabulary (active and passive vocabulary).

When working on the differentiation of sounds, an English teacher needs to focus on all three analyzers: visual, speech-motor, and speech-auditory. However, when it comes to English, this work is simplified by the fact that there is no softening of the consonant sounds at the end of the word (Markova, 2018).

Recommendations for teaching elementary school children with dysgraphia require adherence to the stages of learning, namely:

1. teaching proper articulation of each sound relying on demonstration, auditory perception, as well as kinesthetic sensations;

2. identifying a sound from a syllable, a word, and then a sentence and a whole text;
3. determining the presence or absence of a sound in a word, its place in it (beginning, middle, end), and the sound's place in relation to others (in what place the sound comes, after which sound it is pronounced, before which sound it is heard in a word) (Sadovnikova, 2012a).

Thus, as soon as the child develops accurate articulation of the sound, it is possible to start working on the differentiation of similar sounds. It should be remembered that each newly learned sound should not be perceived only abstractly (by ear), but must be supported by a graphic image – a letter or sometimes a combination of letters. Tasks aimed at the formation and development of skills to correlate the sound with a letter include drawing a word that begins with this sound or writing a letter. Owing to the teacher's adherence to the basic principles (consistency and feasibility) in their practice, the above work will not cause great difficulties.

It is also important to note that success in learning English in elementary school relates primarily to the presence of basic skills in Russian. Beginning to develop the communication competence of junior students, the teacher can face two phenomena of different vectors:

- in the case that the previously studied structures in the native language are similar to those in the foreign language, their acquisition occurs more successfully and, in less time, – a phenomenon referred to as positive transfer;
- if there are some differences between the linguistic systems of the native and foreign languages, this may cause a negative influence on the mechanisms of the native language by the newly developed speech and speech-mental mechanisms in the foreign language. This phenomenon is known in the scientific literature as interference.

Thus, it can be argued that the native (Russian) and foreign languages have phenomena similar in structure but different in focus, meaning that there is interference. This phenomenon can impede the further acquisition of the native language. To reduce the likelihood of interference, the learning process needs to be organized accounting for it, specifically, with authentic materials used in lessons (literary works, folklore, visual, musical works, real-life objects (clothes, furniture, dishes, and images)).

Accordingly, working with students on the development of their graphic and speaking skills is ineffective if carried out only in Russian lessons. The same measures need to be implemented in parallel in English lessons. Furthermore,

influence on the junior student should come not only from the teacher but also from the school psychologist (neuropsychologist) to develop the child's cognitive processes. Work organized in this way will improve the quality of the child's writing and have a positive impact on the development of their memory, thinking, and attention.

Thus, analysis of psychological and pedagogical literature allows arguing that elementary school children often experience difficulties in learning to write. Specifically, they make specific mistakes unrelated to violations of spelling rules, and these mistakes are diverse. These include difficulties in phonemic analysis; mixing sounds close in articulation; difficulties in mastering the visual image of a letter and mixing up letters that are similar in writing. Writing can reflect defects in a child's language development, difficulties in language analysis, and speech attention. Therefore, all these specific errors need to be recognized by the teacher and corrected in time.

### *Results of experimental research*

Among 29 4th-grade students, psychological and pedagogical diagnostics confirmed the presence of dysgraphia in two students:

- Noi Z. showed the tendency to mix up letters in the English alphabet: p and b, l and l, m and n; he often did not complete letters to the end in words; there was also disruption of the stepwise writing of letters;
- Viktor S. was found to not complete writing words, adding extra elements to the letters of the English alphabet, as well as mirroring p and q, mixing up p and b, y and v, and sometimes w and m.

The children also had abnormalities in the order of writing letters.

Considering the nature of writing disorders in English lessons, we diagnosed optical dysgraphia in both cases.

As a rule, this pathology is detected in elementary school students as difficulties in writing letters; difficulty in arranging English words; difficulty in organizing English words into complete sentences; difficulty in taking notes on English texts in class; difficulty in completing homework; difficulty in keeping margins in a notebook; difficulty in spelling and punctuation; difficulty in writing lowercase and uppercase letters.

However, the reading of words or texts in English did not suffer in either student (although it was difficult for them to express their thoughts correctly in writing).

Optical dysgraphia was confirmed in both children (Table 1).

Table 1. Assessment of the written language of students with dysgraphia (ascertaining stage).

Name	Insert the missing letter (7 points)	Finish the end of the word (7 points)	Find a specified letter in a row (3 points)	Total score (17 points)
Noi Z.	2	3	1	6
Viktor S.	2	1	2	5

Source: Author's elaboration

The table shows that Noi Z. managed to score only 6 points in completing the tasks (35.0%). This result demonstrates that the student did indeed have difficulties when selecting and writing certain letters in English words. In particular, the letters challenging for him to distinguish between were p and b, l and l and m and n. In the second task, the child could not put any of the letters in the endings of the two words.

The second student (Viktor S.) succeeded only in 29.0% of the tasks (5 out of 17 points). The most difficult for him was to write the missing letter at the end of a word.

Results of the assessment of stepwise writing of letters are given in Table 2.

Table 2. Assessment of the stepwise writing of letters (ascertaining stage).

Name	Lowercase letters (7 points)	Uppercase letters (7 points)	Total score (14 points)
Noi Z.	2	2	3
Viktor S.	1	2	4

Source: Author's elaboration

As seen in Table 2, Noi Z. properly completed only 21.0% of the tasks (3 out of 14 points). There were also failures to write the letters of the English alphabet correctly. Sometimes the child wrote in a chaotic order, sometimes correctly.

Viktor S. scored 4 out of 14 points (29.0%).

The obtained results give evidence of the under-development of visual-spatial concepts in the children. This implies that the students started writing a letter not from top to bottom and left to right, but from bottom to top and sometimes from right to left.

In the last assessment, the junior students had to write familiar words and numbers under dictation (Table 3).

Table 3. Dictation (control stage).

Name	Words (10 points)	Numbers (7 points)	Total score (14 points)
Noi Z.	2	2	4
Viktor S.	2	2	4

Source: Author's elaboration

Table 3 shows that both students scored the same number of points but the *places* of their errors differ. Each child ended up scoring only 4 points out of 17 (24%).

Analyzing the obtained data, we can confidently assert that both students have a written language disorder, specifically optical dysgraphia. Both boys displayed such mistakes as mirror writing of the letters of the English alphabet (Viktor S.), replacement of letters with ones of similar spelling (Noi Z., Viktor S.), as well as unfinished writing of the endings of some letters of the English alphabet in words. Both children, therefore, required correctional measures to reduce or eliminate the diagnosed dysgraphia.

Practical recommendations on psychological and pedagogical support for elementary school students with written language disorders in English lessons:

1. Development of higher mental processes in children with dysgraphia is required (work of a team of specialists: teacher, teacher-psychologist, speech therapist, teacher of additional education, neurologist, and parents).
2. Specialists should rely on multisensory methods when working with children with writing disorders.
3. It is necessary to work on the development of motor senses in students and their awareness of the graphic movements of the hand.
4. The child's spatial perception and visual memory should be developed.
5. The development of fine motor skills and hand-eye coordination in children needs to be provided (using L.S. Vygotsky's triad).
6. The development of phonetic and phonemic hearing in students should be provided with the obligatory out-loud pronunciation of English letters and words when writing.
7. Continuous writing by students has to be precluded.
8. It is advised to use a gentle, health-saving, comfortable mode of training and loads (reducing the volume of control tasks, step-by-step tasks with instructions, increasing the time to perform work and correct errors) and to use exercises developed on the principles of accessibility, consistency, and systematism.



9. Activities in English lessons should be alternated: reading, sculpting, writing in the sand, didactic games, the Ebru technique, etc.
10. It is necessary to ensure the development of the student's personal sphere: independence, self-control in educational work, and the ability to direct one's attention to the conditions of the task.
11. If necessary, the electronic information and educational environment should be used to provide students with correctional education programs.

As a result of the conducted research on correction, the following scheme for the support for students with dysgraphia in the learning process has been developed (Figure 1).



Figure 1. Psychological and pedagogical support for students with written language disorders in English lessons by a team of specialists

Source: Author's elaboration

Practical recommendations on the psychological and pedagogical support for children with dysgraphia in English lessons in the pre-letter and letter periods:

1. Pedagogical diagnostics should be conducted to detect written language disorders in students.
2. The English teacher needs to work with students with the obligatory participation of parents, a speech therapist, a school psychologist, a neuropsychologist, and a neurologist (if necessary).
3. Labeling students with disorders is to be avoided.

4. The individual features of the child need to be considered.
5. Reliance on the zone of proximal development is required.
6. The types of activity should be changed every 20 minutes.
7. Learning should follow the principle from simple to complex.
8. Transition to the next material should be made only after the current material is assimilated.
9. Special handouts should be used to correct the disorders found in students.
10. It is necessary to allow variation in learning styles and recording lessons on a dictaphone.
11. Information should be presented in a dosed manner.
12. Students should be allowed as much time to complete the tasks as they require.
13. Encouraging the use of mnemonic strategies to facilitate memorization is advised (the correct pronunciation of English words, recalling English words by heart like a multiplication table, rhyming, the Cicero method for developing the child's spatial imagination, I. Aivazovsky's method for developing visual memory, the method of phonetic associations).
14. Color coding techniques (*color-coded language activities*) are recommended to be used in English lessons to distinguish challenging letters in the alphabet (automatic reinforcement of associations).
15. Repeated pedagogical diagnostics should be conducted to test the efficiency of the work done.

**Analysis of the results of program testing**

The results of the assessment of the students' written language are provided below (Table 4).

Table 4. Assessment of written language at the control stage.

Name	Insert the missing letter (7 points)	Finish the end of the word (7 points)	Find a specified letter in a row (3 points)	Total score (17 points)
Noi Z.	4	5	2	11
Viktor S.	4	3	2	9

Source: Author's elaboration

The second diagnostics of the students showed positive shifts. Challenging letters became less difficult, although the children still required a lot of time to complete the task. The share of correct answers given by Noi Z. amounted to 65.0% (11 points).

Progress was also found in the results of Viktor S. The student managed to achieve 53.0% of correctly completed tasks. Following this, we conducted an assessment of stepwise writing of the letters of the English alphabet (Table 5).

Table 5. Assessment of the stepwise writing of the letters of the English alphabet (control stage).

Name	Lowercase letters (7 points)	Uppercase letters (7 points)	Total score (14 points)
Noi Z.	4	5	9
Viktor S.	3	5	8

Source: Author’s elaboration

Both students displayed positive change; the children were more confident performing the tasks. The easiest one was the stepwise writing of uppercase English letters.

Proceeding from the diagnostic results describing the level of manifestation of optical dysgraphia in the two students, a comparative analysis of the data obtained at the ascertaining and control stages was performed (Figure 2).

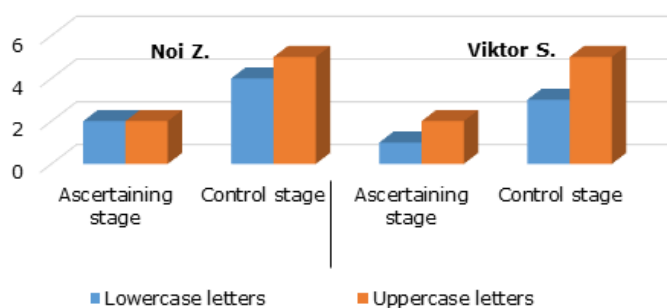


Figure 2. Comparative characteristics of the results of assessing the stepwise writing of letters (at the ascertaining and controlling stages)

Source: Author’s elaboration

Therefore, it can be concluded that the work conducted by the specialist team to reduce dysgraphia in the children with the use of exercises and handouts yielded positive results.

The final diagnostics was a repeated dictation in English. The students were given as much time as they needed. This time, however, they were much more confident in what they wrote. A visual demonstration of the difference in the results obtained is presented in Figure 3.

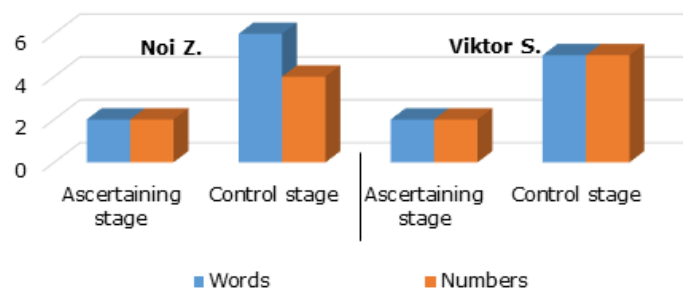


Figure 3. Comparative characteristics of the results of dictation (at the ascertaining and controlling stages)

Source: Author’s elaboration

Summarizing the work done, it can be noted that the organization of network educational activity for students with dysgraphia in English lessons helped to reduce the manifestation of their existing disorders (Figure 4).

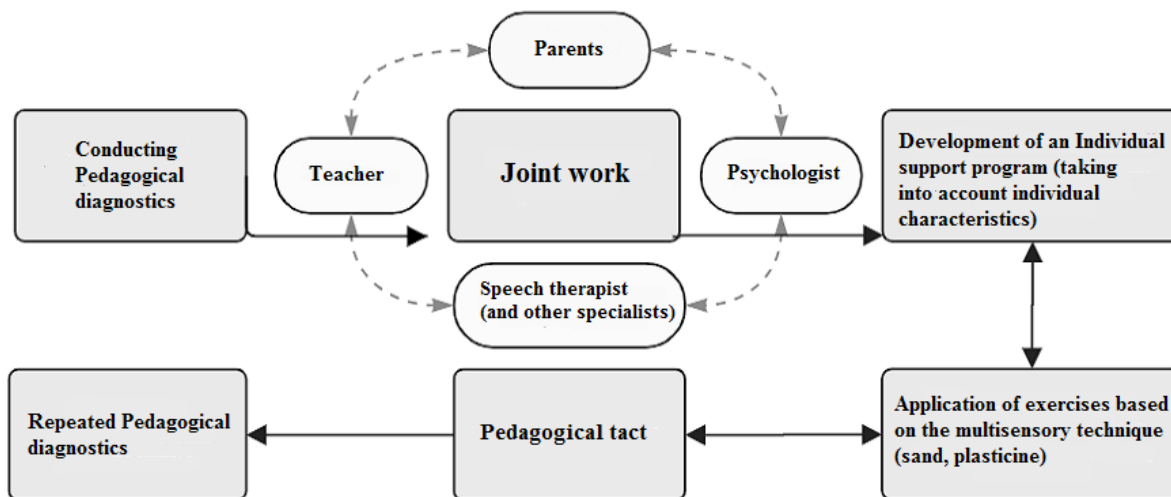


Figure 4. Network map of psychological and pedagogical support in the educational activities of students with dysgraphia in English lessons.

Source: Author's elaboration

## CONCLUSIONS

From the conducted study, we conclude that language disorders (in written and spoken language) hinder the successful development of the child's cognitive activity, producing a detrimental effect on the development of their psyche. Numerous studies demonstrate that all mental processes in children (perception, memory, attention, mental operations, imagination) develop through speech. Lacking development of the language sphere affects the child's overall mental development and translates into serious consequences:

- deficiencies in the child's auditory memory;
- lack of focus and concentration of attention;
- lower level of generalization, difficulty in constructing cause-and-effect relationships;
- insufficient development of the child's communication skills, difficulty in communication.

Therefore, among the vital conditions for the development of proper speech (written and spoken) are the child's good health, proper functioning of the central nervous system, speech motor system, hearing, and vision, as well as communication with adults from an early age, a variety of activities for children, and the richness of their direct perceptions that provide the content of children's speech.

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APPENDIXS








Appendix 1. Assessment of written language in students.

Task: Insert a missing letter in a word (seven words given), write the endings of words (seven words given), and find certain letters in a series of others (three rows of seven letters).

A). Insert the missing letter to match the picture.

_an		_us	
en		_at	
_an		_ot	
_op			

B) Finish the ending of each word.

Su_		Gu_	
He_		Cu_	
Dol_		Tedd_	
Dru_			

C) Find the following letter in the row and circle it:

A) Find the letter "p"

a, b, d, w, p, v, q.

B) Find the letter "m"

n, y, v, m, w, m, u.

C) Find the letter "v"

u, l, v, w, m, v, x.

2. Assessment of students' stepwise writing of the letters of the English alphabet.

At this stage individual work with each student is carried out to monitor the sequence of letter writing.

**Diagnostics No. 2. Assessment of students' stepwise writing of the letters of the English alphabet (lowercase and uppercase).**

Objective: At this stage, individual work with each student is carried out to monitor the stepwise writing of the letters of the English alphabet.

1. Write one row of each letter (lowercase). b d l m p v y	2. Write one row of each letter (uppercase). B D L M P V Y
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3. Dictation.

**Diagnostics No. 3. Conducting a dictation.**

1. Write down the words under dictation. (Words for dictation: winter, autumn, spring, summer, swim, wall, window, lamp, family, yesterday)

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2. Write down the numbers under dictation. (Numbers for dictation: 2, 3, 5, 6, 8, 7, 9).

**Appendix 2. Content of the program.**

For each topic, the following exercises were developed and tested:

1. Emotions and feelings

Dictionary: sad, bored, angry, scared, tired, hungry.

**Task 1. The following sentences appear on the board one by one:**

- 2. When it's raining, you are...
- 3. When you're at the beach, you are...
- 4. When you wake up early, you are...
- 5. When it's snowing, you are...
- 6. When you run a lot, you are...

7. When you see your friends, you are...
8. When it's your birthday, you are...
9. When you lose money, you are...
10. When you eat broccoli, you are...

The task for students with optical dysgraphia is to answer the form of words sculpted out of plasticine.

**Task 2.** Look at and repeat the words: sad, bored, angry, scared, tired, hungry. The teacher then dictates them one at a time, followed by students writing them down and then checking what they have written until they find the wrong letter in the word.

**Task 3.** The following sentences are given:

1. Mike is happy because he has a dog.
2. Ann is angry because she forgot her umbrella.
3. Sam is very hungry all day.

The task of the students is to highlight the letter **d** with a red marker, **b** with a blue marker, **y** with a yellow marker, and **u** with a green marker.

## 2. Tell the tail

**Task 1.** Read a short poem. Circle the letter b, underscore the letter d, and highlight the letter p.

“Chuckles painted the toy box brown,  
Lulu helped and danced around,  
Larry laughed and clapped his hands,  
Chuckles stopped and dropped his paints”.

**Task 2.** The teacher gives the students the following sentences:

1. Once upon a time lived a very beautiful girl.
2. She had a very friendly family.
3. This girl had a younger brother.
4. They always helped each other.

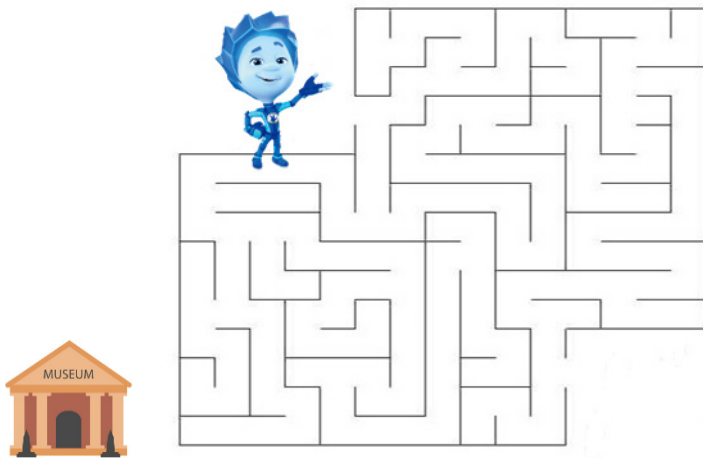
The teacher then hands out sheets of paper with the same sentences but with missing letters. The task is to insert the missing letter.

1. Once u\_on a time live\_ a ver\_ \_eautif\_l girl.
2. She had a very frie\_dlyfa\_ily.
3. This girl ha\_ a younger \_rother.
4. The\_ al\_ayshel\_e\_ each other.

**Task 3.** Make up a short story by writing it in the sand.

### 3. Days to remember

Task 1. The teacher asks the students to help Nolik get to the place he liked best.



Task 2. Help each letter prepare for the trip by making them a friend. (Students repeat the spelling of each letter in the correct order, thereby creating a mate.)

Name: \_\_\_\_\_

A	·	B	·	C	·	D	·
E	·	F	·	G	·	H	·
I	·	J	·	K	·	L	·
M	·	N	·	O	·	P	·
Q	·	R	·	S	·	T	·
U	·	V	·	W	·	X	·
Y	·	Z	·				

Task 3. Using plasticine, write the names of the places you liked best.

#### 4. Place to go.

Task 1. Write the names of the countries you would like to go to in the sand. Why there?

Task 2. Look at the names of the following countries: *Greece, Italy, Portugal, Russia, Mexico, Poland, Spain, Turkey.*

- highlight all of these letters one at a time: *p, y, m, n, u.*

- write down words beginning with these letters.

Task 3. Our travel and hiking plans always depend on the weather. Let's remember what the weather can be like and write down the words under dictation.



The teacher dictates the following words:

*Sunny, windy, cloudy, rainy, cold, hot.*

Highlight all letters *y* in red and all letters *n* in yellow.