



# Optimizing the role of teachers in overcoming student dysgraphia: Neurological study of fine motor developments

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## ABSTRACT

Students with dysgraphia symptoms often have difficulty in writing due to their lack of fine motor skills, which affects how they write neatly and coordinate information. This study aims to analyze how teachers can help students with dysgraphia, particularly in developing fine motor skills, as well as finding supporting and inhibiting factors in their learning process. With a qualitative phenomenological approach through interviews, observations, and documentation, the results show that the role of teachers as educators and mentors is optimal. Teachers can identify students' problems and design appropriate learning. In addition, collaboration between teachers, parents and schools is an important factor in providing consistent support. The implications of this study show the importance of teacher training to recognize and treat dysgraphia, the use of technology to assist writing, and close cooperation with parents. Developing individualized learning programs and creating a supportive learning environment can also help students with dysgraphia develop optimal writing and learning skills.

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## INTRODUCTION

Student learning difficulties are conditions that are in the learning process which are characterized by obstacles to obtaining the expected results (Setyawan et al., 2020). Dysgraphia, in particular, is a writing disorder that results in imbalances in memory and motor development that affect a child's ability to express information in written language (Hidayati, 2023). Children with dysgraphia often show symptoms such as difficulty composing words, fine motor organization for writing, and problems holding writing utensils (Sapitri et al., 2020).

Dysgraphia can be caused by various interrelated factors. One of them is motor impairment, which is difficulty controlling the small muscles in the hand, making the writing sloppy or difficult to read. In addition, perceptual disorders can make it difficult for children to recognize letters or shapes correctly, causing errors when writing. Behavioral disorders can also be a cause, especially if the child gets frustrated easily or has difficulty concentrating when writing. Memory problems, such as difficulty remembering letter order or writing rules, also play a role in causing dysgraphia. The use of a dominant hand, such as a left-handed child who is not used to

writing, can affect their writing ability. Finally, problems in combining visual, motor and cognitive information (cross modal) can make it difficult for children to connect what they see, think and write (Dewi & Herayuni, 2021).

This phenomenon is very important to be analyzed and handled properly in the elementary school environment, because at this stage, children are still in a period of rapid neurological development (González Agulló et al., 2022). Neurologically, stunted fine motor development can affect children's writing skills (Gidion, 2020; Muñoz & García, 2020). The writing process involves coordination between the brain and the small muscles of the hand, so interference in fine motor development will affect the quality of writing. This has an impact on their ability to complete tasks given by the teacher.

The impact of dysgraphia on students' academic performance is significant. Difficulties in expressing ideas in writing hinder the completion of assignments, tests and projects. Problems in spelling and grammar lower the quality of writing, which impacts grades. In addition, these difficulties can lead to falling behind in writing skills and feelings of insecurity when writing. These problems can affect students' ability to convey ideas clearly and meaningfully through writing (Yani & Hanafi, 2024).

Learning difficulties such as dysgraphia reflect wider challenges in the education system, where many students with learning difficulties do not receive adequate support (Casé & Lopes, 2023; Ramlan et al., 2024). One of the major challenges in addressing dysgraphia is teachers' lack of understanding of the condition and limitations in implementing appropriate approaches to deal with it (Dewi, 2024). Many teachers are also poorly trained to identify and help students with dysgraphia. In addition, the limited time and the large number of students in the class make it difficult for teachers to give special attention. Appropriate teaching methods are also difficult to apply because each student has different needs, lack of support from parents and experts is also a problem that needs to be overcome so that children can get maximum help.

This results in students who have difficulty in writing not getting the help they need optimally. As a result, the quality of their learning declines and their academic and social development suffers. This challenge is a major focus for teachers in their efforts to improve learning effectiveness. The role of the teacher becomes very important in overcoming learning difficulties faced by students (Sayida et al., 2023).

With the increasing awareness of diverse educational needs, it is important to find out effective strategies for teachers to support students with learning difficulties. The importance of proper training and understanding for teachers is not only to support students with dysgraphia, but teachers play a crucial role in creating an inclusive and supportive learning environment for all students (Fatmawiyati & Permata, 2022). In addition, diverse and differentiated learning approaches also allow teachers to deliver learning materials in the most effective way for each student (Nurjannah et al., 2024).

Therefore, it is important for teachers in primary schools to have a better understanding of dysgraphia. The application of strategies that teachers can do in improving the writing skills of children with dysgraphia is by participatory learning carried out by teachers, namely providing motivation to students with dysgraphia, using interesting learning media in learning to write, using appropriate learning methods to overcome difficulties in writing (Susanti & Ngatmini, 2024). In addition, collaboration strategies between teachers, students and parents are key in overcoming learning difficulties, enabling problem identification, learning planning and providing the necessary support (Nurjannah et al., 2024).

In Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System, Article 4 Paragraph 1, states that "Education is organized in a democratic and equitable and non-discriminatory manner by upholding human rights and national pluralism" (Rena & S, 2022). This emphasizes the right of every student to receive education according to their needs and abilities. In this sense, it pays attention to students who experience learning difficulties, including

dysgraphia, so that each individual can access education that is appropriate and supports the optimal development of their potential.

Based on the results of observations made at SDI Nurul Ihsan on Monday, September 23, 2024, researchers found problems related to writing difficulties in class I students, there are two students who are suspected of having dysgraphia. This can be seen from students who have difficulty holding a pencil, irregular student writing, mixed use of letters and numbers, writing that does not follow the lines in the book, and one of the two students when writing the student will be guided by the teacher, after the teacher stops guiding, then the student cannot write. In addition, researchers also conducted interviews with homeroom teachers to strengthen information about the difficulties experienced by these students.

Specifically related to the learning difficulties of dysgraphia in students, the homeroom teacher revealed that both students had learning difficulties, especially in writing which affected their academic development. However, the homeroom teacher also emphasized the importance of communication with parents. According to the homeroom teacher, although teachers play a role in helping students at school, parental support at home is very important. Parents who are involved and understand their child's difficulties can provide additional practice and support their child's writing development outside of school hours. If communication between the school and parents is lacking, then efforts to improve children's learning difficulties will be less effective. Parents should be educated so that they can pay more attention at home.

Based on the above observations, some previous studies also show the symptoms experienced by dysgraphia students. Research conducted by Aphrodita (Suryana et al., 2024) shows that the characteristics of students with writing difficulties are the shape of the letters in the writing are inconsistent, capital letters and small letters are still mixed together, the size and shape of the letters are unbalanced, difficulty in holding the pencil correctly, writing is inconsistent even when asked to copy the writing in the book or on the board still have difficulty in writing it. Meanwhile, research conducted by (Simanjuntak et al., 2023) indicates that dysgraphia, a difficulty in learning to write, describes a state of being unable to compose the written word (including spelling mistakes, grammatical errors, or punctuation or very poor handwriting).

Research related to writing difficulties (dysgraphia) has also been researched by several countries including in Iran research conducted by Rostami (Mughtar & Agustina, 2022) shows that children with dysgraphia often write very close to the paper, making it difficult for them to write. Students' poor handwriting takes different forms such as upper and lower case writing, improper spacing between letters and words, messy writing, writing letters and words obliquely and out of line.

The success of the learning process is highly dependent on the teacher's ability to identify and handle students with dysgraphia. Teachers play an active role in the success of the teaching and learning process (Rifqi, 2023). Cooperation with parents is also important in supporting the learning process. Learning difficulties such as dysgraphia are part of the larger challenge of creating an inclusive education system in Indonesia. In Indonesia, although there are regulations that support inclusive education, the implementation still faces various obstacles, such as limited teacher training, lack of resources in schools, and limited methods and technology that support students with special needs. Thus efforts to improve the quality of education and pay attention to the special needs of children, such as those of children with dysgraphia, will be crucial to advancing education and creating quality human resources for the future of Indonesia (Adella & Lestari, 2024).

Based on the above issues, students with dysgraphia learning difficulties face considerable challenges in primary school. In this situation, this study is expected to contribute by providing a clearer picture of the relationship between fine motor development and dysgraphia, and how teachers can optimize the learning process to help children with dysgraphia. Thus, the researcher feels interested in studying and exploring this issue in depth related to various strategies that can

be used by teachers to overcome dysgraphia learning difficulties. This research is entitled "Optimizing the Role Of In Overcoming Student Dysgraphia : Neurological Study Of Fine Motor Developments".

## RESEARCH METHODOLOGY

This research uses a descriptive qualitative approach with a phenomenological research type. Data collection was conducted through interviews, observations, and documentation, with interview guidelines, observation sheets, and documentation studies as research instruments. The data analysis technique refers to the Miles and Huberman model, which includes data collection, data reduction, data presentation, and conclusion drawing or verification. The selection of participants was done by selecting students, teachers, and parents who have experience or direct relationship with dysgraphia symptoms. In this study, the sample size consisted of 1 class teacher, 2 students with dysgraphia, and 2 parents of students with dysgraphia. Despite the limited number, the study focused on gaining in-depth insights into their experiences. Participant selection criteria involved the presence of identified students with dysgraphia, as well as parents and teachers who could provide relevant information regarding the condition.

The main data sources in this study came from direct observation at SDI Nurul Ihsan and interviews with participants, while secondary data were obtained from school documents such as student learning outcome reports, student development records, curriculum documents, and literature or previous research relevant to the topic of dysgraphia. The data validation process is done by triangulation, which is comparing data obtained from interviews, observations, and documents to ensure consistency and accuracy of findings. Using a phenomenological approach, this study aims to understand the participants' subjective experiences related to dysgraphia. Although the results of this study provide deep insights into the conditions at SDI Nurul Ihsan, the results may not be fully generalizable to other schools with different conditions, given the unique context and characteristics of the students. However, the findings can still provide a useful overview for other schools in dealing with dysgraphia symptoms in students.

## RESULTS AND DISCUSSIONS

This research was conducted at SDI Nurul Ihsan class 1, which consisted of 6 students (4 boys and 2 girls). However, the study only involved 2 students who had learning difficulties with dysgraphia. This study aims to understand how teachers can help students with dysgraphia through various ways, such as creating appropriate lesson plans, implementing specific strategies, and providing appropriate guidance. The main focus is to look at the fine motor development of students with dysgraphia and analyze the role of teachers in supporting these students during the learning process.

### **Symptoms of Dysgraphia in Students**

Based on the results of observations made on September 23, 2024, researchers found that there were several children at SDI Nurul Ihsan who experienced learning difficulties, one of which was difficulty in writing called dysgraphia. In grade 1, there are two children who show the characteristics of dysgraphia as described by the researcher (Sari et al., 2020) inconsistency in writing letters in writing using mixed upper and lower case letters, writing with unbalanced letter sizes, appearing to struggle when communicating writing and having difficulty holding a pen or pencil.

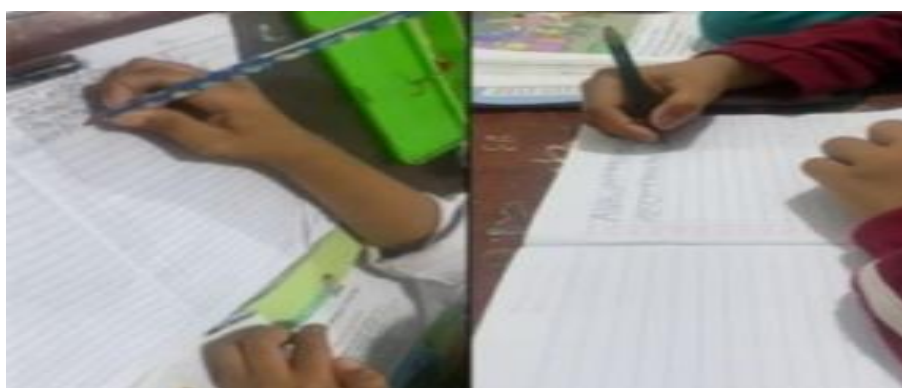
From observations made in the field, it was found that students with dysgraphia symptoms have difficulty in writing, which impacts their ability to complete tasks that involve writing. At SDI Nurul Ihsan, students with this disorder exhibit barriers in fine motor skills, which leads to difficulties in organizing writing and expressing ideas in writing. When students feel frustrated or uncomfortable with a given task, they often show emotional reactions such as anger

or reluctance to continue learning. Therefore, the role of teachers is very important to help overcome these dysgraphia symptoms with a more personalized and adaptive approach, such as using an individualized approach, variations in teaching methods, and providing emotional support so that students feel more comfortable and can learn better. The symptoms experienced by 2 grade 1 students at SDI Nurul Ihsan are presented in the form of a table as follows:

**Table 1.** Symptoms experienced by SDI Nurul Ihsan students

No	Student Name	Symptoms
1.	Moh. ahyan	Hard to hold a pencil Writing is hard to read Writing with slow Uppercase and lower case letters mixed When writing doesn't fit the book line Disproportionate letter size
2.	Hafiza Armaida	Writing is hard to read Write later led Disproportionate letter size When writing doesn't fit the book line Always shows an angry when told to write Always think hard when told to write Writing with slow

From the table above, it can be seen that Ahyan has difficulty holding a pencil, which indicates an impairment in his fine motor skills. In addition, he also experiences other problems such as writing that is difficult to read, writing very slowly, mixing uppercase and lowercase letters, untidy writing on the line of the book, and disproportionate letter size. Meanwhile, Ainun experienced difficulties such as writing that was difficult to read, could only write if guided, disproportionate letter size, writing not on the book line, often getting angry when asked to write, thinking hard before writing, and writing slowly. Based on these symptoms, Ahyan has dysgraphia accompanied by fine motor disorders, while Ainun only has dysgraphia without fine motor disorders. The pictures that show how to hold the pencils of these 2 students are as follows:



**Figure 1.** How students hold a pencil

### Optimizing the Teacher's Role in Overcoming Dysgraphia Symptoms

Based on the results of the study, optimizing the role of teachers in dealing with dysgraphia at SDI Nurul Ihsan focuses on two main aspects, namely as teachers and mentors. The role of teachers in these two aspects can be said to have been optimized, because it has fulfilled three main indicators, namely goals, alternative decisions, and resource restrictions. The results of interviews and steps taken by teachers at SDI Nurul Ihsan are as follows:

- a. Early Identification, teachers carefully observe students who show writing difficulties to ensure that the symptoms that appear are in accordance with the characteristics of dysgraphia. This identification is done through analysis of students' writing, observation of behavior while writing, and discussion with parents regarding the child's development. As stated by Mrs. Nila as the homeroom teacher of grade 1 " As a teacher, I always try to monitor the child's learning activities, especially when he is doing writing assignments. We pay attention to

whether he faces difficulties, such as in writing letters, spelling, or composing sentences. If we find obstacles, such as illegible writing or mistakes in spelling, I immediately provide assistance. In addition, I also communicate with parents to support their child's learning process at home and then ensure that affection for these two children is never neglected. Support and encouragement are always given to keep them motivated to learn consistently. I believe, with constant attention and support, children will be more confident in overcoming their learning difficulties".

The informants' statements above show how important the early identification process is in helping students with writing difficulties. By understanding students' needs and barriers early on, teachers can provide more targeted support and help students develop their abilities. Cooperation between teachers and parents is also very important to ensure that the needs of each student are well met. Through adjustments to learning methods, careful observation, and regular communication with parents, teachers can create a more supportive and comfortable learning atmosphere for students. Continuous support not only helps students overcome difficulties, but also encourages them to be more confident and passionate about learning. This, in turn, will improve the overall quality of learning.

- b. Specialized Learning Planning, teachers adjust lesson plans to meet the needs of students with dysgraphia. For example, teachers provide exercises that focus on fine motor development, such as thickening lines, drawing patterns, or doing activities that train hand coordination (Ningrum, 2023). This step aims to help students overcome writing difficulties slowly and purposefully. In addition, teachers also try to build students' confidence so that they do not feel burdened while learning. With a more personalized and attentive approach, students can learn more comfortably according to their needs. As stated by Mrs. Nila as the 1st grade homeroom teacher, "Children are always accompanied when learning. The trick is to repeat teaching the material, and we must be consistent. In addition, mastery of the material in class is also important, and extra classes need to be conducted to help them. Most importantly, we must be able to approach and understand the hearts of the children. If we communicate regularly every day, it will be easier for us to know the characteristics and needs of each child" then the parent also added "For example, when teaching writing letters, we start with the letter B first, then continue with the small C. For the letter a, we teach the small C first, then add the tail at the back. For the letter A, we teach the small C first, then add the tail at the back. The goal is to find an easy way so that children can understand and remember how to write letters correctly. Likewise with the letter H, we can describe it as an upside-down chair. The point is, we have to find ways or words that are easy and memorable for children to make it easier for them to learn to write."

The statements from the informants above emphasize the importance of adjusting lesson plans to meet the needs of students with dysgraphia. Teachers provide exercises that focus on fine motor development, such as thickening lines or drawing patterns, to help students practice their writing skills gradually (Suggate et al., 2023). In this way, students can learn more comfortably and not feel burdened.

- c. Individualized Approach, students with dysgraphia get special guidance during writing activities, where the teacher provides direct direction and support. This approach helps students feel more confident and motivated to learn. As the homeroom teacher said, "The individualized approach is to give attention and affection to each child. Teachers should also not underestimate the problems faced by children. In addition, it is important to cooperate with parents, especially mothers, by inviting them to discuss the development of their children. This approach is part of the teacher's responsibility to ensure each child's needs are met. Given the current conditions, more individualized learning is necessary so that children get the attention they need."

The statements from the informants above show how important it is to give special attention to students with dysgraphia, especially when they learn to write. Teachers provide direct assistance so that students feel more confident and enthusiastic in learning. With this support, students can more easily face their difficulties and continue to improve.

- d. Parental Cooperation, teachers communicate regularly with parents to provide suggestions regarding exercises that can be done at home, such as drawing activities or using manipulative tools to train children's hand muscles. As said by the grade 1 homeroom teacher "I usually invite parents to discuss the difficulties faced by children, for example in certain lessons. After that, I give suggestions, such as taking additional lessons so that children are more focused in learning. In addition, I also often remind parents to accompany children to study at home and limit the use of cellphones, so that children stay focused and are not lazy to learn". A parent also added: "We communicate very regularly with the school through the WhatsApp group. So, whenever there are things that need to be discussed about our children, we always consult there. If there is a problem or development of the child, both at home and at school, we always inform the school. We also get information from the teacher about the child's condition, so the communication between us and the school is very good and open".

The statements from the informants above show how important cooperation between teachers and parents is in supporting children's learning development. Teachers regularly talk to parents to provide useful suggestions, such as activities that can be done at home to train children's motor skills, such as drawing or using toys that can help train children's hands.

- e. Use of Multisensory Method, teachers apply methods that involve students' various senses, such as learning to write letters with fingers, using a small blackboard, or writing activities with fun movements. As said by Mrs. Nila, the grade 1 teacher, "For example, if children have difficulty writing, I start by introducing the letters first. I teach them to recognize the letters and how to construct words, such as distinguishing the letters "i" and "b". I also help them by holding their hands while writing so they can feel the correct movements. All of this needs to be done consistently so that children can get used to it and become more fluent in writing. Then the student's parents also added "The facilities I provide for children, such as providing special books for reading, writing, counting, and coloring. For example, patterned books with dots that must be connected. I also help the child by paying attention to how he writes, teaching, and directing. One of them is by buying a patterned writing book, so that the child gets used to writing correctly."

The barriers and challenges that researchers found in the field when teachers faced several challenges when dealing with children who have dysgraphia learning difficulties, including: students rarely attend, parental support, and time constraints. The statements from the informants above highlight the importance of using multisensory methods in helping students overcome learning difficulties, especially in writing skills. By involving multiple senses, such as touch, vision and movement, I can create more interesting and effective learning. For example, letter recognition through writing movements with fingers or utilizing tools such as patterned books helps students understand letter shapes visually and motorically (Utari & Rambe, 2023).

Based on the facts found in the field, this research shows that the optimization of the teacher's role in overcoming students' dysgraphia symptoms, especially through neurological analysis of fine motor development at SDI Nurul Ihsan, has never been studied in depth. This research is in line with some previous research results (Azzahra et al., 2023) revealed that writing difficulties in grade 1 elementary school students are influenced by internal factors, such as motor development and cognitive abilities, as well as external factors, such as parental support and learning environment (Yulianasari et al., 2023) highlights that teachers strategies in improving learning motivation of students with dysgraphia involve managing internal and external factors, although faced with obstacles such as limited teacher competence and environmental influences. Research (Sapitri et al., 2020) found that lack of parental attention and lack of cooperation between

schools and parents are the main obstacles in dealing with dysgraphia, so collaboration between the two parties is very important.

Meanwhile (Aftana, 2024) showed that teachers can handle students with dysgraphia by providing motivation through interesting learning methods, appropriate media, and relevant learning resources. Based on these findings, this study confirms that the role of teachers is crucial in helping students with dysgraphia, not only through understanding the neurological condition and motor development of students, but also by ensuring good cooperation between teachers, parents, and schools to support students' learning needs optimally.

Based on previous research, the success of teachers' strategies in dealing with dysgraphia students is also reflected in the results of this study which aims to optimize the role of teachers in overcoming dysgraphia symptoms in students. This study uses the neurological analysis approach of fine motor development which is a novelty in the research. The results showed that teachers' efforts in dealing with dysgraphia were initially limited to basic identification and the use of conventional learning methods. However, along with the implementation of more effective strategies, such as the use of interesting learning media and better collaboration with parents, students showed positive developments in writing skills. Teachers also became more able to optimally adapt learning methods to students' needs.

## CONCLUSION

Based on qualitative research with a phenomenological approach through interviews, observations, and documentation, it can be concluded that the role of teachers as teachers and mentors in overcoming dysgraphia at SDI Nurul Ihsan is optimal in supporting students' writing skills. Teachers play an important role in identifying dysgraphia symptoms through observing student activities, analyzing fine motor skills, and developing learning strategies that suit student needs. As a teacher, teachers use interactive and fine motor-focused methods, such as structured writing exercises, interesting media, and clear directions. As mentors, teachers give special attention to students with dysgraphia through intensive mentoring, motivation, and positive reinforcement. To improve learning strategies, several measures can be implemented. Utilizing technology, such as writing practice apps, can make learning more interesting and effective. A multisensory approach involving sight, hearing and feeling can help students understand the material better. Fine motor training through drawing activities or hand-eye coordination exercises will be very beneficial. Collaboration with a therapist or educational psychologist can also give teachers more knowledge in dealing with dysgraphia. Regular evaluation and adjustment of learning is important to monitor students' progress. Finally, cooperation with parents can strengthen learning support at home. With these steps, it is hoped that teachers can.

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