

## Analysis of Fine Motor Development in Children with Learning Difficulties in Elementary Schools

Alda Zahara Islamyati<sup>1\*</sup> and Wahyu Agus Styani<sup>1</sup>

<sup>1</sup>Elementary School Teacher Education Study Program, Faculty of Teacher Training and Education, Samudra University

\*[aldazahara2606@unsam.ac.id](mailto:aldazahara2606@unsam.ac.id)

Received  
30/05/2026

Accepted  
25/08/2026

Published  
11/10/2026

DOI  
[10.59329/gawi.v6i2.327](https://doi.org/10.59329/gawi.v6i2.327)

### ABSTRACT

This study aims to examine the fine motor skills of lower-grade elementary school students. Fine motor skills involve the coordination of small muscles, particularly those of the hands and fingers, to perform various activities such as writing, drawing, cutting, and coloring. These skills play a crucial role in supporting children's learning processes and overall development during the early years of elementary education. This study employed a descriptive qualitative approach. The research participants consisted of six first-grade students aged 6–7 years who were identified as having learning difficulties at SD Negeri 1 Paya Bujok Tunong. Data were collected through observations and interviews. The participants were selected using purposive sampling based on the classroom teacher's recommendations and the results of an initial assessment identifying students who experienced difficulties in academic activities requiring fine motor coordination, such as writing, drawing, and completing classroom tasks. The findings indicate that the fine motor development of the lower-grade students varied across individuals. Most students demonstrated adequate fine motor skills; however, several students still experienced difficulties with hand coordination and movement accuracy. Factors influencing children's fine motor development included concentration ability, the frequency of practice, family support, screen time, and the instructional strategies implemented by teachers. Both teachers and parents play essential roles in providing appropriate stimulation through creative activities and engaging practice to promote optimal fine motor development. This study is expected to serve as a reference for teachers and parents in understanding the importance of fostering children's fine motor skills from an early age and as an evaluation resource for improving the quality of learning in elementary schools.

**Keywords:** *child development, children with learning difficulties, elementary school, fine motor development*

### How to cite:

Islamyati, A. Z. & Styani, W. A. (2026). Analysis of Fine Motor Development in Children with Learning Difficulties in Elementary Schools. *Gawi: Journal of Action Research*, 6 (2), 377-389



## INTRODUCTION

Motor development is an important aspect of child growth and development that concerns the ability to move the body, including both gross and fine movements. Motor skills develop gradually with age, neural and muscular maturation, and the stimulation provided by the surrounding environment ([Syamsul, 2014](#)). During the elementary school years, motor development serves as an important foundation that supports children's learning, play, socialization, and independence in daily life.

Motor development is divided into two types, namely gross motor and fine motor development. Fine motor development is an important aspect related to the coordination of small muscles, particularly those of the hands and fingers, for activities such as writing, drawing, cutting, coloring, and holding objects precisely ([Baharudin, 2016](#)). These skills are essential for supporting the learning process at school, especially among lower-grade elementary students who are still at the stage of acquiring foundational academic skills. Fine motor skills have also been proposed as an indicator of school readiness ([Grissmer et al., 2010](#)) and are associated with later academic abilities such as arithmetic ([Asakawa et al., 2019](#); [Gashaj et al., 2019](#)). In reality, not all children experience the same motor development (Józsa et al., 2023). Some children show delays or difficulties in certain activities and therefore require special attention and support from both teachers and parents. Environmental factors, parenting patterns, health, nutrition, and opportunities for active movement also influence children's motor development ([Ismail, 2022](#); [Comuk-Balci et al., 2016](#)).

Children with learning difficulties are those who experience obstacles in receiving, understanding, or processing information, which affects their academic performance ([Jamari, 2015](#); [Mardika, 2017](#)). Learning difficulties do not necessarily indicate low intelligence; rather, they reflect disruptions in specific learning processes such as reading, writing, and arithmetic. This condition is often evident when children struggle to follow classroom instruction, lack focus, complete tasks slowly, or produce learning outcomes that do not match their potential ([Fatmaridha, 2019](#)). Children with learning difficulties frequently show limitations in fine motor skills ([Fikriyah, 2021](#)). These difficulties may appear as poor hand-eye coordination, untidy handwriting, slow task completion, and trouble using writing tools properly. Handwriting legibility in young children has been linked to fine motor skills ([Seo, 2018](#)), and writing difficulties among lower-grade students have been examined in relation to several contributing factors ([Utari & Rambe, 2023](#)). Such conditions not only affect students' learning outcomes but can also undermine their self-confidence and participation in classroom learning activities. Fine motor development therefore deserves particular attention, together with appropriate instructional strategies and support from teachers and parents, so that children can take part in the learning process optimally.

In the elementary school setting, teachers play an important role in identifying children's fine motor development, especially among students with learning difficulties. Through creative and stimulating learning activities, such as drawing, playing puzzles, stringing beads, folding origami, or making collages ([Adetya & Gina, 2022](#); [Wandi & Mayar, 2019](#)), children's fine motor skills can be developed gradually. In addition, the family environment is an important factor in providing children with consistent stimulation and practice ([Comuk-Balci et al., 2016](#)). However, elementary school students with delayed fine motor development are still found in practice ([Qadaria et al., 2023](#)). This is influenced by various factors, including insufficient stimulation, environmental conditions, instructional methods that lack variety, and differences in each child's developmental characteristics ([Rizqia et al., 2019](#)). Research is therefore needed to analyze the fine motor development of children with learning difficulties in elementary schools, so that the forms of obstacles they experience and the efforts that can be made to support their optimal development can be identified.

Although various studies have examined fine motor development in elementary school children and children with special needs, most of them have focused on the effectiveness of stimulation or interventions for improving fine motor skills ([Asakawa et al., 2019](#); [Strooband et al., 2020](#); [Telford et al., 2022](#); [Tsai & Chang, 2021](#)). Other studies tend to examine fine motor development in general without specifically linking it to children with learning difficulties in elementary schools ([Bondi et al., 2022](#); [Józsa et al., 2023](#)). Earlier research has also placed greater emphasis on improving motor

skills through particular media or instructional methods ([Adetya & Gina, 2022](#); [Haryadi & Aripin, 2015](#); [Kisno, 2021](#); [Rosalianisa et al., 2023](#); [Wandi & Mayar, 2019](#)), whereas studies that analyze in depth the forms of fine motor obstacles experienced by children with learning difficulties, together with their causal factors, in the context of elementary school learning remain relatively limited. Consequently, few studies describe the actual condition of fine motor development among children with learning difficulties as a basis for designing instructional services that meet their needs.

Based on the foregoing, this study aims to analyze the fine motor development of children with learning difficulties in elementary schools and the factors that influence it. The results are expected to give teachers, parents, and schools a more comprehensive picture of the fine motor condition of children with learning difficulties, so that they can provide appropriate stimulation and instructional strategies to support children's fine motor development.

## METHOD

This study employed a qualitative approach with a descriptive design. This approach was chosen to describe in depth the fine motor development of children with learning difficulties in elementary school. The study was conducted at SD Negeri 1 Paya Bujok Tunong and involved children aged 6–7 years. The participants were six first-grade students who had been identified as having learning difficulties. Participants were selected using *purposive* sampling based on the classroom teacher's recommendations and the results of an initial identification of children who showed difficulties in academic activities such as writing, drawing, and completing tasks that require fine motor coordination. The learning difficulties of the participants included difficulty writing neatly, slow task completion, poor hand-eye coordination, difficulty holding writing tools correctly, and work that did not match their developmental stage. Identification was carried out through the teacher's observations during the learning process, developmental records, students' learning records, and discussions with the classroom teacher about the children's characteristics.

The informant in this study was the classroom teacher, who served as the main source of information for obtaining fuller data on the children's learning development, their characteristics, and the forms of stimulation provided during learning. Data were collected through observation and interviews, and the research instruments were an observation sheet and an interview guide. Observation was used to directly assess children's fine motor skills during classroom learning activities. The observation sheet was developed from indicators of fine motor development for elementary school children, which covered the ability to hold a pencil in the correct position, hand-eye coordination when writing or drawing, the ability to trace and copy shapes or letters, the ability to cut along a pattern, the ability to color without going outside the lines, the ability to control finger and wrist movements during tasks, and the neatness and accuracy with which fine motor activities were completed.

Interviews were conducted with the teacher to obtain information about the factors that influence children's fine motor development. Documentation was used to complement the data, in the form of children's writing samples and records of their learning development. The interview guide was used to obtain information about students' fine motor development, the factors influencing that development, the forms of difficulty students experienced, and the strategies teachers used to provide stimulation and support. The data were analyzed in three stages. First, data reduction was carried out by selecting and grouping information relevant to the research focus. Second, the data were presented in descriptive narrative form to facilitate interpretation. Finally, conclusions were drawn from the analysis and verified through triangulation, in order to obtain a comprehensive picture of the fine motor development of children with learning difficulties in elementary school and the factors that influence it.

## RESULTS AND DISCUSSION

### Results

Based on the observations and interviews, the fine motor development of children with learning difficulties fell into varied categories. Some students performed fine motor activities reasonably

well, while others still had difficulty coordinating hand and finger movements. These difficulties were evident when students wrote, drew, cut, and colored.

[Table 1](#) shows that the six participants varied in pencil grip, hand position, neatness of writing, speed of task completion, and consistency of letter forms. Subject A showed relatively good writing ability, as indicated by a correct pencil grip, an appropriate hand position, and the ability to write simple, legible sentences that followed the lines of the notebook. In contrast, Subject D showed the most pronounced difficulties, especially in pencil grip accuracy, hand position, neatness, speed, and consistency of letter forms, and therefore required intensive support. Subjects B and F also showed difficulties in hand movement coordination, neatness, and consistency of writing. Meanwhile, Subjects C and E could write simple words or text but still had trouble maintaining uniform letter size and neat handwriting. These findings indicate that children's writing difficulties relate not only to the written product but also to fine motor control and hand-eye coordination. The table below describes the writing ability of the children with learning difficulties.

**Table 1. Writing Ability**

| Subject | Writing Ability Indicators                            |                 |                                                 |                       |                                                                     | Ability Description                                                                                                                             |
|---------|-------------------------------------------------------|-----------------|-------------------------------------------------|-----------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
|         | Pencil Grip                                           | Hand Position   | Neatness of Writing                             | Task Completion Speed | Letter Consistency                                                  |                                                                                                                                                 |
| A       | Correct                                               | Already correct | Less neat                                       | Moderate              | Letter forms already appropriate                                    | Able to write simple sentences with legible handwriting and can already follow the notebook lines. Fine motor difficulties are relatively mild. |
| B       | Not yet correct; pencil is gripped too tightly        | Less accurate   | Less neat; writing often goes outside the lines | Slow                  | Some letters are recognizable, but their size is not yet consistent | Able to write simple letters and words but still needs guidance in controlling hand movements so that the writing becomes neater.               |
| C       | Fairly correct                                        | Already correct | Fairly neat                                     | Moderate              | Letters are formed, but their size is not yet uniform               | Able to write simple words but still has difficulty maintaining consistent letter size and neat handwriting.                                    |
| D       | Not yet correct                                       | Less accurate   | Less neat                                       | Very slow             | Letter forms are not yet clear and are often confused               | Has difficulty writing letters completely. Needs intensive support when doing writing tasks.                                                    |
| E       | Fairly correct, but finger position is not yet stable | Already correct | Fairly neat                                     | Moderate              | Letters can be written with fairly good form                        | Able to copy simple writing with the teacher's help. Errors are still found in spacing between words and in letter size.                        |
| F       | Not yet correct; finger coordination is weak          | Less accurate   | Less neat                                       | Slow                  | Letters are often incomplete                                        | Still has difficulty with hand-eye coordination, so the writing is not yet clearly legible and                                                  |

needs continuous  
practice.

As the table shows, children's writing ability developed unevenly. Some children were able to hold the pencil correctly, trace and copy letters, and produce reasonably neat writing. However, several children still had difficulty controlling hand movements, keeping their writing neat, and completing writing tasks within the allotted time.

In an interview, the classroom teacher explained that the writing ability of students with learning difficulties remained varied. Some students could hold a pencil reasonably well and write simple letters, but others still had difficulty controlling their hand movements, so their writing was untidy and they needed more time to finish tasks.

*"Some children can already write simple letters and words, but others still struggle to hold the pencil correctly. Their handwriting is often untidy and the letter size is not yet consistent, so they still need guidance during writing activities." (classroom teacher).*

[Table 2](#) shows differences among the children in drawing and coloring ability, particularly in following patterns, keeping color within the lines, controlling hand movements, and showing carefulness. Subject C performed best, as this child could follow patterns without help, colored almost all areas within the lines, controlled hand movements well, and completed the task independently. In contrast, Subject D had difficulties on almost every indicator, namely trouble following patterns, coloring that frequently went outside the lines, poor control of hand movements, and less than optimal carefulness. Subjects B and F also still needed support because their control of hand movements and their hand-eye coordination had not yet developed optimally. Meanwhile, Subjects A and E could complete the activities with relative independence, although inconsistencies in movement control, neatness, and carefulness were still observed. Drawing and coloring ability thus shows that control of hand movements and hand-eye coordination are important aspects that distinguish each child's level of achievement. The table below describes the drawing and coloring ability of children with learning difficulties.

**Table 2. Drawing and coloring ability**

| Subject | Drawing and Coloring Ability Indicators                                       |                                                            |                                                                    |                                                             | Ability Description                                                                                                                               |
|---------|-------------------------------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|         | Following Patterns                                                            | Going Outside the Lines                                    | Movement Control                                                   | Carefulness                                                 |                                                                                                                                                   |
| A       | The child can follow most of the patterns given.                              | Coloring only occasionally goes outside the lines.         | Hand movement control is fairly good, although not yet consistent. | Fairly careful, but some parts are still missed.            | The child can complete drawing and coloring activities with little help. Carefulness and hand movement control still need to be improved.         |
| B       | The child can follow simple patterns but still needs the teacher's direction. | Colors and drawn lines still often go outside the pattern. | Hand movements are not yet stable, so the drawings are less neat.  | Less careful in completing drawings and coloring.           | The child still needs support in drawing and coloring activities because hand movement control and hand-eye coordination have not developed well. |
| C       | The child can follow patterns well without help.                              | Coloring is almost entirely within the lines.              | Hand movements are well controlled.                                | Careful in drawing and coloring until the task is finished. | The child shows good drawing and coloring ability. Drawings are neat, coloring is                                                                 |

|   |                                                              |                                                               |                                                                               |                                                                |                                                                                                                                                 |
|---|--------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                                                              |                                                               |                                                                               |                                                                | even, and all tasks can be completed independently.                                                                                             |
| D | The child has difficulty following drawing patterns.         | Most of the coloring goes outside the lines.                  | Hand movements are poorly controlled, so the drawings are less clear.         | Carefulness is still low and the child often rushes.           | The child has difficulties on almost all indicators of drawing and coloring and therefore needs intensive support from the teacher.             |
| E | The child can follow simple patterns fairly well.            | Coloring still goes slightly outside the lines in some parts. | Hand movement control is fairly good but not yet stable.                      | Carefulness is fairly good, although some minor errors remain. | The child can draw and color independently but still needs practice to improve the neatness and carefulness of the work.                        |
| F | The child still has difficulty following the patterns given. | Colors often go outside the lines and are uneven.             | Hand movements are less stable, so the drawings do not yet match the example. | Less careful and often leaves parts of the drawing unfinished. | The child needs the teacher's guidance during drawing and coloring because coordination and hand movement control have not developed optimally. |

As the table on drawing and coloring ability shows, children's abilities in these activities also varied. Some children could follow patterns, control their hand movements, and color inside the lines fairly neatly. Others still had difficulty following patterns, often colored outside the lines, lacked carefulness, and had not yet fully developed hand-eye coordination. The teacher explained that drawing and coloring ability also differed among students. Some students could follow the drawing pattern and color fairly neatly, whereas others still often went outside the lines and had difficulty controlling their hand movements.

*"During drawing and coloring activities, some children can already follow the example well. However, some children still often go outside the lines and are not careful enough because their hand-eye coordination has not developed optimally." (classroom teacher).*

[Table 3](#) shows that cutting ability also varied clearly. Subject C showed the best ability, as this child could follow the pattern independently, produced neat cuts that matched the lines, and displayed good hand-eye coordination. Subject A could also cut independently with little help, although accuracy and neatness still needed improvement. Subject D was relatively able to carry out the activity independently but still had difficulty with more complex patterns, especially curved lines. Meanwhile, Subjects B, E, and F showed greater difficulty in following the pattern, maintaining cutting accuracy, and coordinating eye and hand movements. As a result, these three subjects still needed direction and, in some cases, intensive support during cutting activities. The table below describes the cutting ability of children with learning difficulties.

| <b>Table 3. Cutting ability</b> |                           |                                   |                              |                            |
|---------------------------------|---------------------------|-----------------------------------|------------------------------|----------------------------|
| <b>Subject</b>                  | <b>Following Patterns</b> | <b>Cutting Ability Indicators</b> |                              |                            |
|                                 |                           | <b>Accuracy</b>                   | <b>Hand-Eye Coordination</b> | <b>Ability Description</b> |
| A                               | The child can             | Cuts are fairly                   | Hand-eye coordination is     | The child can complete     |

|   |                                                                                     |                                                                                |                                                                                                     |                                                                                                                                                                                       |
|---|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | follow simple patterns fairly well.                                                 | neat, although a few parts do not match the pattern line.                      | fairly well developed, so the child can cut independently with little help.                         | cutting activities along simple patterns but still needs practice to improve the accuracy and neatness of the cuts.                                                                   |
| B | The child can follow some of the pattern, but the cuts often deviate from the line. | Cuts are not yet neat and some parts are cut past the pattern.                 | Hand-eye coordination is not yet optimal, so cutting movements are still unstable.                  | The child still has difficulty cutting along the pattern. Hand movements are not yet well controlled, so the child needs the teacher's direction and support throughout the activity. |
| C | The child can follow patterns well without help.                                    | Cuts are neat and match the pattern line.                                      | Hand-eye coordination is well developed, so cutting movements appear smooth and purposeful.         | The child shows good cutting ability. All activities can be completed independently with neat results that match the pattern.                                                         |
| D | The child can follow simple patterns but still has difficulty with curved sections. | Cuts are fairly neat, but a few parts go outside the pattern line.             | Hand-eye coordination is fairly developed, so the child can control the scissors well.              | The child can cut independently but still needs practice to improve accuracy, especially on more complex patterns.                                                                    |
| E | The child cannot yet follow patterns consistently.                                  | Cuts are less neat and often go outside the pattern line.                      | Hand-eye coordination is still weak, so cutting movements are not yet stable.                       | The child has difficulty with cutting activities. Cutting accuracy is still low, and the child needs continuous teacher guidance so that fine motor skills can develop.               |
| F | The child has difficulty following the specified pattern.                           | The cuts deviate widely from the line and the shapes do not match the pattern. | Hand-eye coordination has not developed well, so the child has difficulty controlling the scissors. | The child needs intensive support when cutting because the child cannot yet coordinate eye and hand movements optimally.                                                              |

As the table on cutting ability shows, children's cutting ability differed across subjects. Some children could follow the pattern and produce reasonably neat cuts with good hand-eye coordination. However, some still had difficulty cutting along the line, produced imprecise cuts, and needed teacher support because their hand-eye coordination was not yet optimal. The interviews showed that cutting remained fairly difficult for some students. The teacher reported that some students could not yet cut according to the pattern and still needed help when using scissors.

*"Children with learning difficulties usually still struggle to follow the pattern when cutting. Their cuts often go past the line, so I need to support them directly." (classroom teacher)*

Overall, Table 4 shows that the fine motor skills of the six children were at varied levels.

Subject C showed the best achievement, rated good in drawing, cutting, and coloring and adequate in writing. In contrast, Subjects B and F were rated poor in all observed aspects, namely writing, drawing, cutting, and coloring. Subject A was relatively consistent, rated adequate in all aspects. Subject D was rated adequate in cutting but poor in writing, drawing, and coloring. Subject E showed a mixed profile, rated poor in writing and cutting and adequate in drawing and coloring. In general, these results show that children's fine motor skills did not develop uniformly across activities. The [Table 4](#) below presents the results of the analysis of the fine motor skills of children with learning difficulties.

**Table 4. Results of the analysis of children's fine motor skills**

| Child | Age     | Writing  | Drawing  | Cutting  | Coloring | Category |
|-------|---------|----------|----------|----------|----------|----------|
| A     | 6 years | Adequate | Adequate | Adequate | Adequate | Adequate |
| B     | 7 years | Poor     | Poor     | Poor     | Poor     | Poor     |

|   |         |          |          |          |          |          |
|---|---------|----------|----------|----------|----------|----------|
| C | 7 years | Adequate | Good     | Good     | Good     | Good     |
| D | 7 years | Poor     | Poor     | Adequate | Poor     | Poor     |
| E | 6 years | Poor     | Adequate | Poor     | Adequate | Adequate |
| F | 6 years | Poor     | Poor     | Poor     | Poor     | Poor     |

The analysis above shows that the fine motor skills of children with learning difficulties varied widely. The participants were six first-grade children aged 6–7 years who had been identified as having learning difficulties on the basis of the classroom teacher's observations, learning development records, and discussions with the teacher. Of the six children observed, one was in the good category, meaning the child was developing well but still needed teacher support; two were in the adequate category, meaning they were developing adequately but still needed teacher support; and three were in the poor category, meaning they still required intensive teacher support in writing, drawing, cutting, and coloring.

Fine motor development in children with learning difficulties was also influenced by several factors: concentration ability, practice intensity, family support, screen time, and the learning strategies applied by the teacher. The first factor was concentration. Most participants were easily distracted when doing activities that demanded precision, such as writing, drawing, coloring, and cutting. As a result, children often stopped working before finishing or needed repeated direction from the teacher.

The second factor was practice intensity. The teacher indicated that regular practice at home and at school influenced children's fine motor development. Children who more often engaged in activities such as writing, drawing, coloring, stringing beads, or cutting showed better development than children who rarely received stimulation.

The third factor was parental support, which also affected fine motor development. Children who received support while studying at home tended to be more confident and to complete tasks faster than children who received less support. Besides internal factors within the child, the family and school environments also influenced fine motor development. Limited parental involvement in providing activities that train hand skills meant that children were less accustomed to fine motor activities. Excessive screen time can also reduce children's opportunities for the physical and creative activities that support motor development.

The fourth factor was extended screen time, which reduced children's opportunities to engage in manipulative activities that train finger and hand coordination. The fifth factor was the teacher's role. Teachers play an important part in supporting children's fine motor development through creative and enjoyable learning. Activities such as coloring, stringing beads, playing with modeling clay, folding paper, and drawing can provide effective stimulation for improving children's hand and finger coordination. Teachers also need to give special attention to children with learning difficulties so that they receive support suited to their needs. Fine motor development in children with learning difficulties therefore requires cooperation between teachers and parents. Appropriate stimulation, sustained practice, and a supportive learning environment can help improve children's fine motor skills so that learning can proceed more optimally.

## Discussion

The results show that the fine motor skills of first-grade elementary students with learning difficulties were at varied levels of development in writing, drawing and coloring, and cutting. This variation was evident in differences among subjects in controlling hand movements, maintaining movement accuracy, coordinating the eyes and hands, and completing fine motor activities independently, which is in line with evidence that fine motor skills grow at different rates in young children and are shaped by several predictors ([Józsa et al., 2023](#)). Overall, Subject C showed relatively better fine motor skills than the other subjects, whereas Subjects B and F had difficulties in almost all the observed activities. This is consistent with [Mardika \(2017\)](#), who showed that fine motor skills in children with learning difficulties are not homogeneous, so that skills should be identified according to each child's characteristics and needs ([Jamaris, 2015](#)).

In writing, the children's difficulties were evident not only in the written product but also in the process of writing itself. Some children had difficulty holding the pencil correctly, positioning the hand, keeping their writing neat, controlling hand movements, and maintaining consistent letter size and form. Similar difficulties have been reported among lower-grade students ([Qadaria et al., 2023](#); [Utari & Rambe, 2023](#)), and handwriting legibility has been linked to fine motor skills ([Seo, 2018](#)). Subject A showed relatively better ability because this child could already write simple, legible sentences that followed the lines of the notebook. In contrast, Subject D had more complex difficulties, marked by unclear letter forms, frequently confused letters, and a need for intensive support. Subjects C and E could produce simple writing but were still inconsistent in letter size, spacing between words, and neatness. Meanwhile, Subjects B and F showed more obvious difficulties in finger and hand-eye coordination. The findings on writing also revealed a difference between the ability to produce writing and the ability to control the writing process. In line with [Irmawanty \(2019\)](#), writing skills in children are closely related to fine motor coordination, which underlies control of hand and finger movements. The writing difficulties found in this study can therefore be understood as a problem involving several motor components at once, rather than merely an academic writing skill. The observations indicate that the more limited a child's control of hand movements and hand-eye coordination, the greater the guidance the child needs when completing writing activities.

In drawing and coloring, the children's abilities also varied clearly. Subject C could follow patterns without help, keep coloring within the lines, control hand movements, and complete the task independently. In contrast, Subject D had difficulties on almost all indicators, while Subjects B and F still needed support because their control of hand movements and hand-eye coordination were not yet optimal. These findings suggest that drawing and coloring can reveal how well children integrate visual perception with motor movement ([Rizqia et al., 2019](#)). Following patterns and coloring within the lines require directed movement control ([Bondi et al., 2022](#)), while carefulness requires children to sustain attention throughout a task. Differences in drawing and coloring ability also show that independence in completing a task does not always mean that every component of fine motor skill has developed optimally. Subject E, for example, could already draw and color independently but still needed practice to improve neatness and carefulness. This shows that assessment of fine motor skills needs to consider both the process and the quality of the work at the same time. A child may complete a task without help yet still need stimulation to improve movement precision and the quality of the work.

In cutting, a similar pattern of ability was found. Subject C showed the best ability, as this child could follow the pattern independently, produce neat cuts, and display good hand-eye coordination. Subject A could also carry out the activity independently with little help, whereas Subject D could cut independently but still had difficulty with more complex patterns. Difficulties were more evident in Subjects B, E, and F, who had trouble following the pattern and controlling the scissors. These findings show that cutting demands more complex coordination because children must integrate the opening and closing of the scissors with hand movements that follow the direction of the pattern visually. Cutting is also one of the activities used to train fine motor skills in the early grades ([Kisno, 2021](#)). Viewed as a whole, the analysis indicates a tendency for children with better hand-eye coordination and movement control to also perform better across various fine motor activities. Subject C is the clearest example, being rated good in drawing, cutting, and coloring and adequate in writing. In contrast, Subjects B and F were rated poor in all observed aspects. This pattern suggests that hand-eye coordination and movement control are important components supporting children's success in various fine motor activities.

Nevertheless, the results also show that fine motor skills do not always develop uniformly across types of activity. Subject D, for example, was rated poor in writing, drawing, and coloring but adequate in cutting. Subject E also showed a differing pattern, with writing and cutting rated poor and drawing and coloring rated adequate. These conditions show that fine motor skill is a construct made up of interrelated abilities that do not always develop at the same level ([Bondi et al., 2022](#); [Józsa et al., 2023](#)). Fine motor interventions or stimulation should therefore not be delivered generically but tailored to each child's specific abilities.

Kisno (2021) reported that fine motor development is influenced not only by the child's biological maturation as an internal factor but also by stimulation provided consistently through the family and school environments as external factors. Children who had repeated opportunities for manipulative activities showed better fine motor skills than children who rarely practiced. This shows that fine motor development results from the interaction of internal and external factors, consistent with the role of neural maturation in motor development (Syamsul, 2014) and with evidence that the environment shapes young children's fine motor performance (Comuk-Balci et al., 2016).

The concentration difficulties found in some subjects also affected their ability to complete activities that require precise coordination of hand movements. Difficulty sustaining attention led children to make more errors when writing, drawing, coloring, and cutting. Attention-related abilities and fine motor performance have likewise been examined together in earlier studies (Gashaj et al., 2019; Tsai & Chang, 2021). Learning in the early grades therefore needs to be designed around activities that are engaging, varied, and suited to children's developmental characteristics so that they can stay focused. Qadaria et al. (2023) stated that repeated practice is consistent with motor development theory, according to which fine motor skills develop through the maturation of the nervous system, supported by continuous experience and practice. The more often children engage in activities involving finger, hand, and eye coordination, the better their movement control becomes.

Rizqia et al. (2019) likewise found that families and teachers play complementary roles in supporting fine motor development. Parental support at home through simple activities, such as drawing, coloring, playing puzzles, stringing beads, and cutting, can reinforce the stimulation teachers provide at school. Creative activities such as origami and collage have also been used to stimulate fine motor skills (Adetya & Gina, 2022; Wandi & Mayar, 2019), and learning media can support this stimulation in the classroom (Rosalianisa et al., 2023). Conversely, limited opportunities for practice and excessive screen time can reduce children's manipulative experiences and slow their fine motor development.

These findings have important implications for teaching children with learning difficulties in elementary schools. Learning activities that involve writing, drawing, coloring, and cutting can be used not only as part of academic work but also as a means of stimulating fine motor development (Kisno, 2021). Because fine motor skills are associated with school readiness and academic abilities such as arithmetic (Asakawa et al., 2019; Gashaj et al., 2019; Grissmer et al., 2010), supporting them early can benefit learning more broadly. Based on the observed patterns, children with greater difficulties need practice that is gradual, repeated, and accompanied by support, in line with evidence from motor skill interventions in younger children (Strooband et al., 2020; Telford et al., 2022). Children who already perform at an adequate or good level still need enrichment activities to improve accuracy, neatness, coordination, and independence.

The results thus confirm that fine motor skills in first-grade children with learning difficulties need to be understood individually and multidimensionally. Assessment should not rest only on whether a child can complete a task; it should also attend to how the child holds tools, controls movement, follows patterns, maintains accuracy, coordinates eyes and hands, and produces work independently. The variation found among the six subjects reinforces the importance of individual assessment as a basis for determining the forms of stimulation and learning strategies that suit each child's needs (Jamaris, 2015; Polsley et al., 2022).

It can therefore be concluded that improving fine motor development in children with learning difficulties requires collaboration between teachers and parents (Comuk-Balci et al., 2016; Rizqia et al., 2019). Teachers need to provide learning that is rich in fine motor activities, while parents need to offer opportunities for sustained practice at home. With consistent stimulation suited to each child's needs, fine motor development can progress more optimally and support learning success in the early grades of elementary school.

## CONCLUSION

Based on the results, it can be concluded that the fine motor development of first-grade elementary students with learning difficulties varied across participants. In writing, some students still had difficulty holding the pencil correctly, tracing and copying letters, keeping their writing neat, and finishing writing tasks within the allotted time. In drawing and coloring, the difficulties found included trouble following patterns, coloring that still went outside the lines, hand movement control that was not yet optimal, lack of carefulness, and hand-eye coordination that had not fully developed. In cutting, some students still had difficulty following patterns, producing precise cuts, and coordinating eye and hand movements when using scissors. These findings show that fine motor difficulties affect learning activities that require hand skills, particularly the completion of academic tasks in class.

This study also shows that fine motor development is influenced by various internal and external factors. Internal factors include concentration ability, movement coordination, and developmental readiness, while external factors include stimulation at home, parental support, teachers' instructional strategies, the learning environment, the intensity of fine motor practice, and screen time habits that reduce children's opportunities for manipulative activities. Children who received consistent stimulation through writing, drawing, coloring, cutting, folding, and other fine motor activities tended to develop better than children who rarely practiced.

Teachers and parents play an important role in supporting children's fine motor development by providing appropriate stimulation and practice. Creative and enjoyable learning activities, such as drawing, coloring, stringing beads, folding paper, and educational play, can help improve children's hand coordination. Cooperation between school and family is therefore essential so that the fine motor development of children with learning difficulties can progress optimally and support students' learning success in elementary school.

The results confirm that developing fine motor skills in children with learning difficulties requires sustained collaboration between teachers and parents. Teachers need to provide varied, meaningful learning that is rich in fine motor activities, while parents need to offer support and regular opportunities for practice at home. Synergy between school and family is expected to optimize children's fine motor development, thereby supporting learning readiness, increasing independence, and helping children achieve better academic development.

## CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

## AUTHOR CONTRIBUTIONS STATEMENT

Author contributions to this study are as follows: Conceptualization, AZI; methodology, AZI; formal analysis, AZI and WAS; writing, preparation of the original draft, AZI; writing, review and editing, AZI. Both authors (AZI and WAS) have read and approved the final version of the manuscript.

## AI DISCLOSURE STATEMENT

The authors declare that this research was prepared, researched, written, and edited without the aid of artificial intelligence techniques.

## ACKNOWLEDGMENTS

The authors gratefully acknowledge Samudra University for the institutional support provided throughout this study. The authors also sincerely thank SD Negeri 1 Paya Bujok Tunong for granting permission and providing valuable support and cooperation during the data collection process. The authors extend their appreciation to the teachers and students for their participation and valuable contributions to this study.

## FUNDING

This research received no external funding.

## REFERENCES

- Adetya, S., & Gina, F. (2022). Bermain Origami untuk Melatih Keterampilan Motorik Halus Anak Usia Dini. *Altruis: Journal of Community Services*, 3(2), 46–50.
- Asakawa, A., Murakami, T., & Sugimura, S. (2019). Effect Of Fine Motor Skills Training On Arithmetical Ability In Children. *European Journal of Developmental Psychology*, 16(3), 290-301.
- Baharudin. (2016). Pendidikan dan Psikologi Perkembangan. Yogyakarta: Ar-Ruzz Media.
- Bondi, D., Robazza, C., Lange-Küttner, C., & Pietrangelo, T. (2022). Fine Motor Skills And Motor Control Networking In Developmental Age. *American Journal of Human Biology*, 34(8), 237-258. <https://doi.org/10.1002/ajhb.23758>
- Comuk-Balci, N., Bayoglu, B., Tekindal, A., Kerem-Gunel, M., & Anlar, B. (2016). Screening Preschool Children For Fine Motor Skills: Environmental Influence. *Journal of Physical Therapy Science*, 28(3), 1026-1031.
- Fatmaridha, S. (2019). Perkembangan Anak-anak Selama Masa Sekolah Dasar (6 – 7 Tahun). *Didaktika : Jurnal Kependidikan*, 8(2). 89-100.
- Fikriyah, S.N. (2021). Analisis Perkembangan Fisik-Motorik Siswa Kelas 3 di Sekolah Dasar Negeri Tajem. *Pendidikan : Jurnal Ilmiah Pendidikan*, 2 (1), 200–207.
- Gashaj, V., Oberer, N., Mast, F. W., & Roebers, C. M. (2019). Individual Differences In Basic Numerical Skills: The Role Of Executive Functions And Motor Skills. *Journal Of Experimental Child Psychology*, 18(2), 187-195.
- Grissmer, D., Grimm, K. J., Aiyer, S. M., Murrah, W. M., & Steele, J. S. (2010). Fine Motor Skills And Early Comprehension Of The World: Two New School Readiness Indicators. *Developmental Psychology*, 46(5), 1008.
- Haryadi, T., & Aripin. (2015). Melatih Kecerdasan Kognitif, Afektif, dan Psikomotorik Anak Sekolah Dasar Melalui Perancangan Game Simulasi “Warungku”. *Andharupa : Jurnal Desain Komunikasi Visual dan Multimedia*, 1(2), 39-50.
- Irmawanty. (2019). “Positive Behavior Intervention Support (PBIS) pada Siswa Berkesulitan Menulis”. *Metodik Didaktik : Jurnal Pendidikan Ke-SD-an*. 15(1): 43-59
- Ismail, M. (2022). Psikologi Perkembangan Anak Usia Sekolah Dasar. Jakarta: Rajawali Pers.
- Jamaris, M. (2015). Kesulitan Belajar Perspektif, Asesmen dan Penanggulangannya Bagi Anak Usia Dini dan Usia Sekolah. Bandung : Ghalia Indonesia.
- Józsa, K., Oo, T. Z., Borbélyová, D., & Zentai, G. (2023). Exploring the Growth and Predictors of Fine Motor Skills in Young Children Aged 4–8 Years. *Journal Education Sciences*, 13(9), 939. <https://doi.org/10.3390/educsci13090939>
- Kisno. (2021). Upaya Meningkatkan Kemampuan Motorik Halus Menggunakan Teknik 3M (Melipat, Menggantung dan Menempel) Pada Anak Usia Sekolah Dasar Kelas Awal : Penelitian Tindakan pada Anak Sekolah Dasar Kelas Awal di SDN 8 Metro Timur. *IJIGAEd : Indonesian Journal of Islamic Golden Age Education*, 2(1), 18-31.
- Mardika, T. 2017. “Analisis Faktor-Faktor Kesulitan Membaca Menulis dan Berhitung Siswa Kelas 1 SD”. *Jurnal Dinamika Pendidikan Dasar*. 10(1), 28-33.
- Polsley, S., Powell, L., Kim, H. H., Thomas, X., Liew, J., & Hammond, T. (2022). Detecting Children’s Fine Motor Skill Development Using Machine Learning. *International Journal of Artificial Intelligence in Education*, 32(4), 991-1024.
- Qadaria, L., Rambe, K., B., Khairiah, W., Pulungan, R., M., I., Zahratunnisa E. (2023). Analisis Faktor Penyebab Rendahnya Keterampilan Menulis Belajar Siswa SD Kelas IV. *Jurnal Bintang Pendidikan Indonesia*, 1 (3), 97–106.
- Rizqia, M., Iskandar, W., Simangunsong, N., & Suyadi, S. (2019). Analisis Psikomotorik Halus Siswa Ditinjau dari Keterampilan Menggambar Anak Usia Dasar SD. *Al-Aulad: Jurnal Pendidikan Dasar Islam*, 2(2), 45-53.
- Rosaliana, R., Purwoko, B., & Nurchayati, N. (2023). Analysis Of Early Childhood Fine Motor Skills Through The Application Of Learning Media. *IJORER: International Journal of Recent Educational Research*, 4(3), 309-328.

- Seo, S., M. (2018). The Effect Of Fine Motor Skills On Handwriting Legibility In Preschool Age Children. *Journal Of Physical Therapy Science*, 30(2), 324-327.
- Strooband, K., F., De Rosnay, M., Okely, A. D., & Veldman, S. L. (2020). Systematic Review And Meta-Analyses: Motor Skill Interventions to Improve Fine Motor Development In Children Aged Birth To 6 Years. *Journal of Developmental & Behavioral Pediatrics*, 41(4), 319-331.
- Syamsul, Y. (2014). *Psikologi Perkembangan Anak dan Remaja*. Bandung : PT.Remaja Rosdakarya.
- Telford, R. M., Olive, L. S., & Telford, R. D. (2022). The Effect Of A 6-Month Physical Literacy Intervention On Preschool Children's Gross And Fine Motor Skill: The Active Early Learning Randomised Controlled Trial. *Journal of Science and Medicine in Sport*, 25(8), 655-660.
- Tsai, M. a., & Chang, C. H. (2021). The Effect Of Martial Arts Training On Selective Attention And Fine Motor Skills In Children: A Quasi-Experimental Study. *Journal Of Motor Aearning And Development*, 9(3), 245–258.
- Utari, V., & Rambe, R. N. . (2023). Analisis Faktor-Faktor Kesulitan Menulis Pada Siswa Kelas Rendah di SD/MI. *Didaktika: Jurnal Kependidikan*, 12(3 Agustus), 361–372.
- Wandi, Z. N., & Mayar, F. (2019). Analisis Kemampuan Motorik Halus dan Kreativitas pada AnakUsia Dini melalui Kegiatan Kolase. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 4(1), 363-369.