

## **EFFECTS OF FINE MOTOR TRAINING IN IMPROVING THE LEGIBILITY OF HANDWRITING OF STUDENTS WITH SPECIAL EDUCATIONAL NEEDS**

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### **ABSTRACT**

The research aims to study the impact of fine motor training on improving handwriting legibility of students with special educational needs (SEN) in a Special Education Integrated Programme (SEIP) in the Pitas area. Besides, the study also aims to assess the existing level of handwriting legibility of students with special educational needs (SEN). Using a quantitative approach through quasi-experimental methods, the study involved pre-post testing of unbalanced groups that both groups of respondents had almost the same characteristics. The sample selection is purposefully sampled, i.e. the selected respondents have almost the same characteristics of handwriting skills and involve four students with special educational needs divided into two groups, the control group, and the treatment group. The instrument used is an adaptation of the Handwriting Legibility Scale (HLS) which has been translated into Bahasa and modified according to the study's relevance. Data obtained through pre, and post-tests were then analysed using descriptive analysis involving averages (min) through Microsoft Excel software. Findings show that fine motor training can improve handwriting legibility of students with special educational needs by an average of (min) 15 scores and indicate an increase in the level from very poor to moderate. Fine motor skills are important to master for all students with special educational needs as these skills have a huge positive impact on their quality of life in the future. Fine motor training was also seen to have an impact on handwriting skills as well as handwriting legibility of students with special educational needs.

**Keywords:** fine motor training; handwriting legibility; handwriting; special educational needs

### **1. INTRODUCTION**

Handwriting is one of the important skills that all children need to master, handwriting legibility is increasingly emphasized as it indirectly affects their academic achievement in school. According to the content in the Special Education Learning Standard Document (Revised 2017), among the basic skills focused is writing skills. This shows that handwriting skills are increasingly being given special attention not only to mainstream students but also to students with special educational needs (SEN). Zainol and Majid (2022) stated in their study that a common problem among students with special educational needs is the difficulty of writing. Issues arising from this

writing skill mostly involve the legibility of handwriting such as letter size, letter shape, and distance between letters and words. The problem of handwriting legibility among students with special educational needs (SEN) is not a new issue, instead, special education teachers and parents with special needs children are also concerned about this issue. However, this problem often faces a less suitable solution, especially for low-functional students.

Shafie (2022) defines fine motor skills as an ability or skill to use motor sensory where coordination of small muscle movements occurs. Handwriting legibility, on the other hand, is often associated with the mastery of children's fine motors. The three main elements that affect a child's fine motor skills include the strength of the finger to hold an object, the control of the movement of the finger, and the sensory to find out if an individual has sensory problems holding an object or not. Looking at most of the situations that occur in schools, the main factor that can be identified contributes to the lack of mastery of handwriting skills in students with educational needs (SEN) among them is the development of fine motor skills that are still at a lower level.

Handwriting skills are seen as a difficult skill to master as students with special educational needs (SEN) especially low functionality are very weak in terms of eye and hand coordination. Therefore, some children regardless of students with special educational needs (SEN) or typical children need extra effort from a young age to learn to write neatly and clearly (Tse et al. 2018). Fancher et al. (2018) in their study titled "Handwriting Acquisition and Intervention: A Systematic Study" found that primary school students benefit if handwriting is taught explicitly. Handwriting legibility also improved with adequate training through interventions supported by motor learning theory and cognitive learning strategies. The fine motor training taught and given in stages in this study was seen as an intervention that will improve handwriting legibility through finger movement training as well as eye and hand coordination. Therefore, this fine motor training is important to be exposed to and applied by students with special educational needs (SEN) during their daily activities whether at home or school.

However, there are still fewer studies focusing on improving the legibility of handwriting using fine motor training interventions. Most students with special educational needs (SEN) especially those with low functionality do not master fine motor skills due to lack of early exposure as well as appropriate fine motor training. In addition, activities involving fine motor training especially aimed at improving the muscle strength of the fingers as well as hand and eye coordination are also less practiced in schools but instead focus on student gross motor training. Therefore, this study is expected to interest school organizations, especially teachers and the community i.e. parents in finding suitable methods so that students with special educational needs (SEN) fine motor skills can be trained as early as possible to make it easier for them to master basic writing skills when they started school. In addition, this study specifically provides benefits to the field of special education, especially on the issue of student with special educational needs (SEN) handwriting legibility which arguably has not found an effective solution to this day.

Seo (2018) states that handwriting is an important functional task that children need to perform in primary school and is an important skill that affects their academic achievement. Piller and Torrez (2019) argue that fine motor skills are often associated with poor handwriting which will affect a variety of tasks related to an individual's academics. Supporting this opinion, students with special

educational needs (SEN) should also master handwriting skills regardless of their limitations or academic shortcomings. Through other studies on handwriting skills among students with special educational needs (SEN), it is hoped that it will have a positive impact on more parties, especially teachers and parents to prioritize and apply fine motor training to children with special needs specifically to those with low functionality so that handwriting skills can be mastered, and handwriting legibility can be improved. The various fine motor training activities used by researchers in this study can be used as a guide and a source of inspiration to the school and the community in planning and implementing appropriate early interventions to improve the legibility of handwriting among students with special educational needs (SEN).

Mastering handwriting skills well especially in terms of legibility is one of the achievements that some students with special educational needs (SEN) find difficult to obtain, especially for those who have low functionality and have not yet mastered the other basic 3M skills such as reading and counting. The main factor that causes weakness in terms of students with special educational needs (SEN) handwriting legibility is the fine motor skills that are still at a very weak level. The fine motor training used in this study to improve the legibility of handwriting benefits not only the medium-functioning student with special educational needs (SEN) but also the low-functioning through the training of finger, and wrist muscle movement and subsequently training their eye and hand coordination. This repetitive exercise will directly enhance the mastery of their fine motor skills while improving handwriting legibility.

The problem of handwriting legibility among students with special educational needs (SEN) in primary schools is still at a critical level. Recent studies have shown that impaired motor coordination and motor visual skills have an association with children's ability to master handwriting skills (Duizer et al., 2020). According to Taverna et al. (2020), motor-visual skills are an important component of handwriting skills. This is because handwriting skills can only be achieved when motor and visual skills have been mastered by a child. Special education teachers and parents with special needs children put less emphasis on the aspect of handwriting legibility. Therefore, this study was conducted to improve students with special educational needs (SEN) handwriting skills in primary school through the implementation of fine motor training interventions involving the movement of fingers and coordination of the eyes and hands.

## **2. LITERATURE REVIEW**

Handwriting skills become one of the basic skills that every child must master as 31 to 60% of school activities involve them performing handwriting and other fine motor activities (Sakamat & Abd Khalid. 2019). Similarly, for students with special educational needs (SEN), these handwriting skills are increasingly emphasized to improve the quality of their achievement in the academic field. This is because, special education teachers are more aware of the importance of these handwriting skills being revealed at an early stage, which is for students with special educational needs (SEN) who are in primary school so that these skills can be fully mastered before undergoing the transition to secondary school and beyond into the realm of employment.

Handwriting skills are a form of communication that can be applied by individuals in everyday life, especially for those with speech skills problems. In addition to educational purposes,

handwriting can also convey messages or be used as a communication tool in a written form (Hairi et al., 2021). Kadar et al. (2020) state in a systematic study of occupational therapy interventions of handwriting skills in children aged 4 to 6 years that children's writing skills interventions should be considered at a young age to ensure the correct development of writing skills.

Like handwriting skills, fine motor skills are also an important aspect of a child's developmental growth as it allows them to engage in a variety of meaningful activities, especially in everyday life, learning, games, and social interaction. From an early age, fine motor skills are required for a variety of daily activities such as wearing clothes, eating, craft activities, and various other activities that children acquire through successful involvement in their early learning experience (Strooband et al., 2020a). This fine motor skill involves the movement of small muscles such as coordination between the eyes and hands, eyes and feet or eyes, or hands and feet, and the ability to move the fingers.

In the early development of a child, they will learn to control the small muscles of the body including the hands, fingers, eyes, tongue, and toes, and this development is known as fine motor development. The development of fine motor varies according to the specific age of a child, and it is important to master in preparation for stepping into school as it allows children to perform various tasks necessary to learn. In preschool and primary school settings, daily routines and activities certainly involve opportunities for children to engage and learn fine motor skills (Caramia et al., 2020).

The mastery of fine motor skills in children is deteriorating due to several factors such as the development of increasingly sophisticated technological tools and materials. Most children nowadays get exposure to motor skills through smart devices that usually use fingers, and this closes the opportunity for the development of motors especially their fine motors (Breuhl, 2020). Lack of exposure to written material can have both a positive and negative effect on the development of the child's fine motor. Therefore, mastery of fine motor skills is important because it affects children's handwriting skills. This statement can be supported by findings from studies of the effects of fine motor interventions on handwriting where the findings show that fine motor interventions show improvements in children's handwriting skills.

Motor skills are also important in the development of a child's handwriting skills which involve the small muscles of the hands and fingers. It is for this reason that the development of fine motor skills helps children build a muscle strength foundation that will contribute to various interests in the functioning of their daily lives such as writing skills. Alamargot et al. (2020), in their study of the delay in the development of dyslexic children's handwriting, identified that dyslexic children are not only associated with problems in terms of reading difficulties but are also associated with a weakening of fine motor mastery to the detriment of handwriting performance. The lack of mastery of fine motor skills not only negatively affects children's handwriting but also indirectly affects the activities of children's daily lives, especially in terms of self-management.

The mastery of a child's handwriting skills is evaluated from various aspects and among them include legibility. This handwriting legibility study examines a lot about the association between fine motor skills as well as children's handwriting skills. The study by Seo (2018) on the effect of

fine motor skills on children's handwriting legibility showed a high association between fine motor skills and handwriting legibility. The accuracy of hand manipulation skills is a factor that affects the legibility of children's handwriting. Therefore, the provision of activities that can help the development of hand manipulation accuracy and fine motor should be emphasized during treatment by occupational therapy to children at preschool age as such activities can help in improving the legibility of handwriting.

Caravolas et al. (2020) state that handwriting legibility refers to how clear and easy a person's handwriting is to read. Handwriting skills require mastery of fine motor skills to control pencils and form letters with the correct pressure on paper. Therefore, the weakness in mastery of fine motor skills affects the legibility of an individual's handwriting. The problem of handwriting legibility that exists in children, especially for students with special educational needs is due to poor mastery of fine motor skills. They can write optimally just like other typical children but experience weaknesses in terms of the legibility of writing. Handwriting legibility should be emphasized in writing skills as the ability to produce neat or at least easy-to-read handwriting also requires appropriate training and intervention. Therefore, this aspect of handwriting legibility should be further emphasized in teaching and learning to students with special educational needs in line with the emphasis on mastery of fine motor skills and writing skills.

The neatness of handwriting affects the subjective value of the quality of handwriting (Fitjar et al., 2022). Weaknesses in mastery of handwriting skills can cause individual self-confidence to decline especially among children. Not only that, but children also who have not yet mastered these handwriting skills are likely to miss out on learning because they are unable to produce writing that is easy to read and slow in activities involving handwriting. For students with special educational needs, poor mastery of handwriting skills will cause them to lose interest in academic activities involving writing and this causes them to become less interested in studying or attending school. Apart from that, they will usually complete the work hastily and painstakingly because of the weaknesses in mastery of these handwriting skills.

Fancher et al. (2018) in a systematic review of handwriting acquisitions and interventions found that handwriting legibility can be improved through adequate training. The application of interventions under motor learning theory and cognitive learning strategies is effective in improving the legibility of handwriting. Handwriting skills are a form of skill that plays an important role in everyone's life regardless of age and remains the dominant writing modality in most classroom environments in primary school (Fitjar et al., 2022).

### **3. METHODOLOGY**

This study used a quantitative (quasi-experimental) approach which only involved pre-test (before) and post-test (after) to see the effectiveness of fine motor training in improving the handwriting legibility of students with special educational needs (SEN) in primary school. Researchers chose the quasi-experiment because the design of such studies was intended to establish a cause-and-effect relationship between independent and leaning variables (Thomas & Zubkov, 2023) and was the type of study design that was seen as most suitable for assessing improvement of handwriting legibility before and after the implementation of fine motor training.

The quasi-experimental design selected in this study involved disproportionate pre-post-group testing of both groups of respondents with almost identical characteristics. In the design of the selected study, the respondents were divided into two groups, namely the treatment group and the control group as shown in Table 1. Both groups underwent pre-test (before) and post-test (after) through a method of recopying sentences containing all letters from 26 alphabets, and a handwritten legibility score assessment using the Handwriting Legibility Scale (HLS) adaptation.

Table 1: Unbalanced group pre-post-test design

Group	Number	Pre-test	Treatment	Post-test
Control	2	X1	-	X2
Treatment	2	X1	T1	X2

Indicators:

**X1**-Pre-test

**T1**-Treatment

**X2**-Post-test

The study was conducted at a national school in Pitas district, Sabah with the Special Education Integration Programme (SEIP). The selected sample of studies consisted of 4 students with special education needs of level 2 which differed in age, gender, and level of cognitive ability. The sample selection is purposely sampling for which the respondents of this study have certain characteristics as required by the researcher. The researchers selected a group of respondents who had similar handwriting skills and were divided into two groups, namely the treatment group and the control group. Respondents to the treatment group will be given an intervention to see if the fine motor training provided affects the improvement in handwriting legibility or not while the control group will learn in a normal setting.

The treatment group consists of two students, namely respondent 1 and respondent 2. Respondent 1 is a male student who is diagnosed with low *vision* and is 10 years old. The handwriting skills of respondent 1 are still at a weak level, especially in terms of letter formation, distance between words, and letter size, and still require monitoring and guidance from teachers when completing assignments in the classroom. Respondent 2 was a 10-year-old female student who was diagnosed with a specific learning disorder. These 2 respondents have handwriting skills that are at a moderate level but still need guidance, especially in terms of the distance between words and letter formation.

The control group also consisted of two students, respondents 1 and 2 like the treatment group. Respondent 1 of the control group was a male student who was diagnosed with physical disabilities (epidermolysis bullosa) and had moderate handwriting skills. Respondents 1 of this control group still need guidance in terms of letter formation, the distance between letters, and the distance between words during activities involving handwriting. For respondent 2, the control group was a 10-year-old male student who was diagnosed as intellectually disabled. The respondents of these



2 control groups had poor handwriting skills, especially in terms of letter formation, letter size and spacing between letters, and distance between words.

### 3.1. Instruments

In this study, researchers used the Handwriting Legibility Scale (HLS) to assess the respondents' handwritten legibility scores. The pre-test and post-test given to the respondents used a pangram handwritten sheet – the quick brown fox jumps over the lazy dog which contains at least once for all alphabets a – z. Handwriting Legibility Scale (HLS) is a scale used to assess the legibility of an individual's handwriting as a whole taking into account the five main criteria of letter formation, the size of the letters, the spacing between letters and words, the quality of lines (the neatness and straightness of the lines in handwriting) and the legibility of the entire word. The Handwriting Legibility Scale (HLS) was developed specifically for 9-year-olds and contains three main components, namely legibility, speed, and spelling errors. The legibility component, on the other hand, is divided into five sub-components, where each of these sub-components should be assigned a Likert scale value of 1 to 5. A higher score of points shows a very poor performance and a low score of points shows an excellent performance. Table 2 below is an item in the adaptation checklist of the Handwriting Legibility Scale (HLS) which items taken from the legibility component used by the researchers in this study.

Table 2: Handwriting Legibility Scale (HLS) checklist

Items	Scale				
	1	2	3	4	5
Legibility					
1 – At the first reading, all words can be read					
5 – At the first reading only, a few words can be read					
Effort					
1 – At the first reading, no effort is required to read the word					
5 – At first reading, more effort required to read words					
Layout on the page					
1 – Excellent on-page layout					
5 – Very poor layout on the page					
Lettering					
1 – All letters are well-formed					
5 – Most letters are not well-formed					

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Change

1 – No change of elements, tracing, or rewriting letters in words

5 – Most words contain adding elements, tracing, or rewriting letters in words

The respondent's handwritten legibility score obtained from this Handwriting Legibility Scale (HLS) instrument will then be recorded in the adaptation checklist of the five items contained in the Handwriting Legibility Scale (HLS) to make it easier for researchers to analyse and compare data. Table 3 shows the five-point Likert scale used by researchers in the checklist to assess the handwriting legibility of students with special educational needs (SEN) in Pitais.

Table 3: Five Point Likert Scale

Score	Statement
1	Excellent
2	Good
3	Moderate
4	Poor
5	Very poor

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### 3.2. Data Collection and Analysis Procedures

The researchers first gave the pre-test to 4 selected study respondents. The results of the pre-test were analysed and assigned a score using the Handwriting Legibility Scale (HLS), then recorded in the checklist. The awarding of pre-test scores will be carried out by special education teachers who teach in schools where studies are conducted and need to have at least 5 years of teaching experience in the field of special education. The score obtained from the Handwriting Legibility Scale (HLS) will then be recorded in the checklist by the researchers to assess their handwriting legibility level.

Fine motor training will be given to a treatment group of 2 study respondents, while 2 respondents in the control group will follow the usual learning setting without a fine motor training intervention. Once the intervention implementation period is over, the control group and treatment group will be given a post-test. The results of this post-test will go through the scoring process using the Handwriting Legibility Scale (HLS) just like the pre-test and will then be recorded in the checklist.



Once the data collection process is implemented, the researcher then descriptively analyses the data using *Microsoft Excel* software, and the data is translated into the form of tables as well as graphs. The descriptive analysis of the data used by this reviewer was to see the average value (mean) of the respondent's handwriting legibility level before and after the fine motor training intervention. Table 4 below shows the interpretation of the average score (mean) used by the researcher in the process of analysing the data.

Table 4: Average score of handwriting legibility level

Score	Level	Description
0 – 10	Very good	All words can be easily read, and the position of letters on lines and spaces between words is in order.
11 – 15	Moderate	Not all words can be easily read, and the position of letters on lines and spaces between words is irregular.
16 – 25	Very poor	Few words can be easily read, and the position of letters on the lines and the space between words are very irregular

## 4. FINDINGS

To determine the respondent's handwriting legibility, the researchers set the level for each Handwriting Legibility Scale (HLS) score achieved by the respondents on a Likert scale of 1 to 5 points. The lower the score scale obtained by the respondents for each item showed that the legibility of the pupil's handwriting was excellent, while the higher the respondent score scale showed that the legibility of the pupil's existing handwriting was at a very poor level. This section of the findings is explained to answer the question of the study as well as the objectives of the study presented by the reviewer. The respondent's handwritten legibility was assessed based on scores obtained from several items tested in the Handwriting Legibility Scale (HLS). Among them are legibility (overall), effort, page layout, letter formation, and change.

### 4.1. Increased level of handwriting legibility of students with special educational needs

The question of the study can be answered through the comparison of the average findings (mean) of the handwriting legibility score for each group of respondents. Figure 1 shows the findings of the handwriting legibility level score obtained from the pre-and post-test tests of both study respondents.

For the control group, respondents 1 and 2 scored 23 and 16 respectively during the pre-test, while 23 and 15 scored during the post-test. Looking at the total scores for the control group during the

pre- and post-tests, respondent 1 did not show any decrease, i.e. 23 scores on the post-test same as the scores on the pre-test. For respondent 2, control groups showed a decrease of only 1 point from 16 scores to 15 scores. Thus, the two respondents in this control group did not show a large score change in handwriting legibility.

Figure 1: Comparison of pre-and post-group test scores of respondents

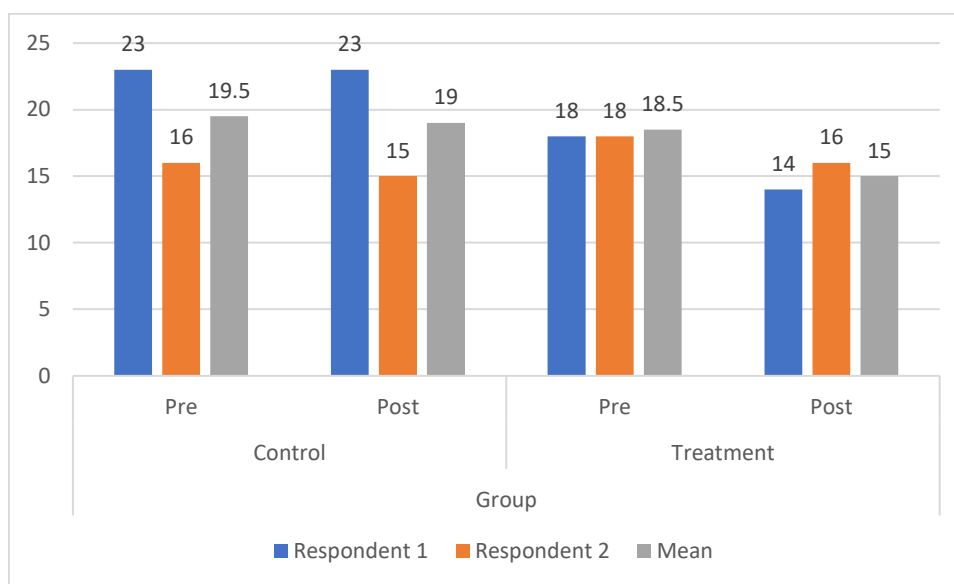


Figure 1 above also shows the scores obtained by respondents who were in the treatment group. For the treatment group, respondents 1 and 2 scored 18 and 19 respectively during the pre-test, while 14 and 16 scored during the post-test. Looking at the total score for this treatment group, respondent 1 showed a decrease in score by 4 points from 18 scores to 14 scores. Respondent 2 treatment groups showed a decrease in the score by 3 points from 19 scores to 16 scores. The two respondents who were in this treatment group showed significant changes in scores after undergoing a fine motor training intervention.

The comparative finding of the average score (mean) of the control group in the pre-test was 19.5 scores while in the post-tests an average (mean) of 19 scores. It can be seen through the average difference between these two tests that there was an average decrease of 0.5 scores for the control group. This means that the handwritten legibility of the respondents of the control group underwent little change even without undergoing fine motor training but the interpretation of the legibility level of this group of respondents was still at the same level as it was, which remained at a very poor level (scores between 16 – 25). This showed that the respondents of the control group did not experience a significant improvement in their level of handwriting legibility.

For the treatment group, respondents scored an average (mean) of 19.5 scores during the pre-test before undergoing fine motor training and scored 19 during the post-test after undergoing fine motor training. This showed that there was an increase in the level of legibility of the pupil's

handwriting after undergoing fine motor training from a very bad level (score between 16 – 25) to a moderate level (score between 11 – 15). The difference in the average finding (mean) of scores obtained on pre- and post-test tests as well as changes in the interpretation of the average finding level (mean) of this treatment group showed that there was an effect of fine motor training on handwriting legibility of students with special educational needs (SEN) in primary school. In conclusion, fine motor training is seen as an intervention that can help to improve the handwriting legibility of students with special educational needs.

## 5. DISCUSSION

This study was to look at the effect of fine motor training on the handwriting legibility of students with special educational needs in primary school. Handwriting legibility is seen as important because it can determine the meaning that the author is trying to convey in terms of knowledge or understanding of a topic (Collette et al., 2017). Handwriting is one of the most important life skills and is influenced by other skills such as visual integration – motor and fine motor control (Sheedy et al., 2021). Motor skills in children are categorized into two types, namely gross motor, and fine motor. The development of motor skills, on the other hand, must occur optimally for both (Chalkiadaki, A. 2018).

Riyadi et al., (2023) state that what is meant by fine motor skills is the child's ability to show and master beautiful muscle movements in the form of coordination and agility in using hands and fingers. The use of concrete materials such as A4 paper, chopsticks, sewing kits, and *diamond painting* kits to train children's fine motor skills in this study is a form of working activity in which small muscles and coordination of children's eyes and hands are trained repeatedly, and in stages for a while. The variety of materials used is also capable of stimulating children's motor senses through touch and other sensory senses. This statement can be supported by the study of Kamaruddin et al. (2023) which states that the use of plasticine media in the development of fine motors provides sensory stimulation through touch and other senses when the child holds and forms plasticine.

The findings showed that there was an increase in the handwriting legibility of students with special educational needs (SEN) after undergoing fine motor training which increased to a moderate level (score between 11 – 15) compared to before undergoing fine motor training which was at a very poor level (score between 16 – 25). This means that fine motor training applied as an intervention in this study can help students improve their handwriting legibility level. The results of this study are in line with the findings of Jaafar et al., (2022) study, which found that the use of "My Fimoki" in teaching and daily learning showed an improvement in the mastery of the writing skills of preschoolers. The application of fine motor activity in daily teaching and learning is seen as helping to improve children's writing skills. Therefore, the application of more activities that can train children's fine motor in teaching and learning in schools such as sledding and narrowing activities should be given more attention by teachers when planning the implementation of teaching and learning especially to students with special educational needs (SEN).

The findings by Fancher et al., (2018) in a systematic review of handwriting acquisitions and interventions found that handwriting legibility can be improved through adequate training. In line

with the findings of the study, it was found that respondents from the treatment group showed a significant improvement in their handwriting legibility after undergoing fine motor training. The findings found that the level of handwriting legibility of students with special educational needs (SEN) changed from very poor to moderate levels. Although these changes did not show a high improvement, this could prove that the fine motor training given to the survey respondents over a certain period was seen to have a positive effect on the level of handwriting legibility of students with special educational needs (SEN).

Piller & Torrez (2019) believe that fine motor skills are often associated with poor handwriting which will affect a variety of tasks related to an individual's academics. In line with this study, the fine motor training given to students with special educational needs (SEN) aims to improve their handwriting skills, especially in terms of legibility. Through the improvement in the aspect of handwriting legibility among these students with special educational needs (SEN), it is hoped that it will make a difference in their academic performance while in school and thus create confidence and interest to participate in various activities involving academic aspects.

The implications of the study directly affect the school, which is the teacher and the student as well as the community i.e. the parents. The findings showed that fine motor training interventions had a direct impact on students' handwriting legibility. Fine motor training was used as a form of intervention in improving the handwriting legibility of students with special educational needs (SEN) in this study involved a variety of sensory through visual, kinesthetics, and even tactile approaches. Children's fine motor capabilities will be easier to develop with the availability of support materials for them to learn and interact with. This statement can be supported by the Ch'ng & Ahmad (2023) study which shows that "Cekap Menulis" is effective in the visual-motor skills of autistic students with handwriting problems. This is because visual-motor skills include components of gross motor skills, visual focus, fine motor skills, two-way coordination skills, and hand coordination skills – eyes enable children to perform the visual and motor coordination needed for writing. This means that fine motor training is important for all teachers and prospective teachers to apply in their teaching and learning in schools to help improve the legibility of students' handwriting.

In addition, parents play an important role in supporting the development of their children's fine motor skills. As emphasized by Agard et al. (2021) on the need for attention and involvement of parents in matters related to the development of children's fine motor because it was found that children who do not receive support from parents are more likely to have low quality rates in fine motor development. Through this study, it is hoped that it will provide more awareness to parents in paying attention and monitoring the level of fine motor skills of children to develop according to their age. For children with fine motor development problems, appropriate early intervention will be provided so that the problems detected can be overcome early.

## **6. CONCLUSION**

The conclusions from this study found that fine motor training influenced the improvement in the handwriting legibility of students with special educational needs. This means that the planning and implementation of teaching and learning activities that can create direct or indirect interaction of

students with various activities involving fine motor training should be practiced by all teachers to enable the development of children's fine motor to increase. Learning activities that can stimulate the development of children's fine motor, especially in terms of the movement of the fingers and the coordination of the eyes and hands should be emphasized as early as possible so that the development of their gross motor and fine motor grows in a balanced manner. In the aspect of special education, this activity involving fine motor training is seen as a method or intervention that can improve various life skills among students with special educational needs, especially self-management skills and skills related to their academics such as writing skills.

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