

## Improving the Pre-Writing Ability of Students with Intellectual Disabilities with the Sensorial Montessori Method (Classroom Action Research in Class III SLB N Simalungun, North Sumatra Province)

 <https://doi.org/10.31004/jele.v11i1.2101>

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### A B S T R A C T

This study aims to describe the implementation process of the Montessori sensorial method for improving pre-writing skills of students with mild intellectual disabilities in Grade III at SLB Negeri Simalungun. The study used a collaborative Classroom Action Research (CAR) design conducted in two cycles, each consisting of planning, action, observation, and reflection stages. The research subjects were two students with mild intellectual disabilities. Data were collected through observation, prewriting skill tests, and documentation, and were analyzed qualitatively to describe the learning process and quantitatively to identify improvements in pre-writing skills across cycles. The findings indicate a gradual and significant improvement in students' pre-writing skills from the initial condition to the end of Cycle II, as reflected in enhanced abilities to trace lines, thicken and imitate simple patterns, and demonstrate better fine motor coordination. In addition, students showed increased active engagement, focus, and self-confidence during the learning process. The novelty of this study lies in the specific application of the Montessori sensorial method utilizing kinetic sand as a tactile sensory medium in pre-writing instruction for students with mild intellectual disabilities in a special school context, contributing both theoretically and practically to the development of adaptive learning approaches in special education.

**Keywords:** *Mild Intellectual Disabilities, Pre-Writing Skill, Montessori Sensorial*

#### Article History:

Received 16<sup>th</sup> January 2026

Accepted 31<sup>st</sup> January 2026

Published 01<sup>st</sup> February 2026



## INTRODUCTION

Children with intellectual disabilities are children with special needs who have a below-average level of intelligence, so they experience obstacles in various aspects of development, such as academic skills, communication, and social interaction (Rochyadi, 2012). One of the categories in intellectual disability is mild intellectual barrier, which is a condition when individuals experience limitations in intellectual function, but still have the potential to develop optimally if they receive educational services that suit their characteristics and needs (Amelia, 2020). Children with mild intellectual barriers generally have a certain IQ range and are still able to develop in basic social and academic aspects through appropriate educational interventions (Susanti & Iswari, 2013). Even though they have intelligence below that of children in general, children with mild intellectual barriers still have the opportunity to develop basic academic skills, such as reading, writing, and numeracy (Widada, 2014). However, learning for children with mild intellectual barriers requires a special approach because they have difficulty understanding abstract concepts, require repetition, and require intensive and ongoing guidance. Therefore, teachers are required to have skills and creativity in choosing appropriate learning methods and media so that the learning process becomes more interesting and learning goals can be achieved optimally (Ummah, 2023). The success of learning is inseparable from the strategic role of teachers as designers and implementers of learning that is adaptive to the needs of students (Armaini DLL., 2022)

One of the important academic skills for children to master is writing skills. Writing plays a role in improving language skills as a means of indirect communication and supporting the success of learning at the next level of education (Yaqien, 2018). Before children are able to write completely, an initial stage known as pre-writing ability is needed. The pre-writing stage is a preparation stage that aims to train fine motor coordination, hand gesture control, and children's readiness to form writing symbols (Susanto, 2012). Pre-writing activities include simple activities such as making horizontal, vertical, slanted, and curved lines which are important foundations in learning to write (Purwanti & Watini, 2022).

The results of initial observations made by researchers at SLB Negeri Simalungun show that the pre-writing ability of students with mild intellectual disabilities in grade III is still relatively low. The writing learning process implemented by teachers still uses direct learning methods with whiteboard media, so learning tends to be monotonous and does not involve concrete learning experiences. This condition has an impact on the low motivation of students to learn and the lack of development of pre-writing skills shown by students. The results of the assessment showed that students with the initials SZS and NSS were able to hold stationery correctly, but still had difficulty in bolstering lines, making basic outlines, writing vowels, and writing their own names. These findings suggest that students' pre-writing skills still require structured exercises and learning approaches that are more in line with the characteristics of children with mild intellectual disabilities

The problem in pre-writing learning indicates the need to apply learning methods that emphasize direct learning experiences and the use of concrete media. One of the relevant methods to apply is the sensory Montessori method. The Montessori method emphasizes *hands-on learning* by involving the use of props designed to stimulate children's sensory functions (Yunitasari DLL, 2023). In pre-writing learning, the sensory approach, especially in the tactile aspect, is very suitable for children with intellectual barriers because it helps them understand concepts through touch and concrete activities. One of the teaching aids that can be used in the sensory Montessori method is kinetic sand, which functions to train fine motor coordination and writing readiness gradually. According to Maria Montessori, the Montessori approach places the child at the center of the learning process, which demands independence, and the instructor only plays the role of a director who provides guidance without too much intervention (Gutek, 2013). Research (April, 2023) shows that the application of montessori games at Alfath School Surabaya has been very good where this study uses the same bound variables, namely pre-writing and independent variables of the sensory montessori method.

Previous research has shown that the sensory Montessori method is effective in improving pre-writing skills in children with special needs (Apriani, 2023). In addition, this method is in line with the learning principle for children with intellectual disabilities, namely the principle of demonstration, which emphasizes the use of concrete teaching aids to overcome children's limitations in abstract thinking (Kasiyati & Grahita Kusumastuti, 2019). However, research that specifically examines the application of the sensory Montessori method to tactile aspects with the help of kinetic sand media in improving the pre-writing ability of children with mild intellectual disabilities, especially in the context of grade III in SLB, is still limited. Therefore, this study is different from previous research because it focuses on the use of kinetic sand as a tactile sensory medium in pre-writing learning, so it is expected to strengthen theoretical studies on the application of the Montessori method in special education and make a practical contribution to the development of learning that is relevant to the needs of students in the present and future.

This article discusses the application of the sensory Montessori method in pre-writing learning for children with mild intellectual disabilities in grade III at SLB Negeri Simalungun. The discussion focused on the use of tactile sensory approaches with the help of kinetic sand media as a means to practice pre-writing skills, especially the ability to thicken lines and make a baseline as the initial foundation of writing skills. Through this presentation, the article highlights how the sensory Montessori method provides a concrete learning experience that

supports children's fine motor readiness and its relevance in improving the quality of pre-writing learning for children with mild intellectual barriers.

## METHOD

This study uses a collaborative classroom action research approach, with the aim of improving and improving the quality of the pre-writing learning process in children with mild intellectual disabilities. Classroom action research was chosen because it is reflective and focuses on efforts to improve learning practices in a sustainable manner through planned actions (Asrori, 2007; Iswari DLL., 2017). The approach used in this study is a qualitative approach to describe the learning process and changes in student learning behavior, as well as a quantitative approach to describe the improvement of students' pre-writing skills through test results and data presentation in the form of graphs (Noveria, 2019).

### Respondents

In this study, the subject of the study is a teacher who teaches students with mild intellectual disabilities in grade III with the initials SZS and NSS.

### Instruments

The research instrument is made according to the purpose of measurement and the theory used as the basis. Research instruments are made for one specific research purpose that cannot be used by other studies, so researchers must design their own instruments to be used. The arrangement of instruments for each study is not always the same as that of other studies because the objectives and working mechanisms in each research technique are also different (Sukendra & Atmaja, 2020). The instruments used in this study were teacher and student observation sheets as well as tests of students' actions in pre-writing activities

### Procedures

The research procedure is carried out in two cycles, where each cycle consists of four stages, namely planning, implementation of actions, observation, and reflection as proposed by (Arikunto, 2016). In the planning stage, the researcher and collaborator teachers compile learning tools, determine learning outcomes, design teaching modules based on sensory Montessori methods, and prepare observation and test instruments.

The action stage is carried out through pre-writing learning using the sensory Montessori method with the help of kinetic sand media, which is carried out in four meetings in each cycle. Each meeting lasts for 1 × 35 minutes with the stages of the beginning, core, and closing activities. The observation stage is carried out by observers to observe the activities of teachers and students during learning to obtain data on the process and results of implementing actions. The observation data is then analyzed and used as a basis in the reflection stage to evaluate the advantages and disadvantages of learning that has been implemented. The results of the reflection are used as material for improvement and action planning in the next cycle.

### Data analysis

Data analysis in this study was carried out qualitatively by describing findings based on certain categories and quantitatively by comparing the results of students' pre-writing ability tests in each cycle to see an increase in pre-writing skills.

## FINDINGS AND DISCUSSION

### Results

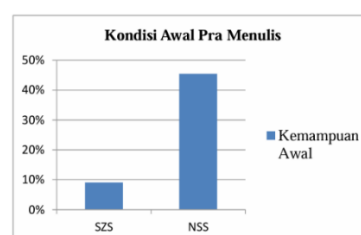


Image 1. Initial Condition Chart

The results of the study shown in figure 1 show that the pre-writing ability of students with mild intellectual disabilities in grade III at SLB Negeri Simalungun in the initial condition is still in the low category and has not met the criteria for achieving learning objectives. Based on the results of the initial assessment, SZS students obtained a percentage of pre-writing ability of 9.09%, while NSS students obtained 45.45%. These findings suggest that learners still have difficulty in basic pre-writing skills, such as thickening lines, imitating simple shapes, and coordinating eye and hand movements. This condition reinforces previous findings that children with mild intellectual disabilities require a concrete, structured, and well-oriented learning approach to fine motor stimulation.

The implementation of actions in Cycle I through the application of the sensory Montessori method with the help of kinetic sand media showed an increase in pre-writing skills in both students. At the end of Cycle I, the pre-writing ability of SZS students increased to 38%, while NSS reached 63%. In addition to increasing results quantitatively, qualitatively students began to show interest in learning media, courage to try to trace patterns, and improve fine motor coordination even though they still needed intensive assistance from teachers. However, the results in Cycle I have not fully met the criteria for learning completeness, so improvements and improvements are needed in Cycle II.

Improvement of actions in Cycle II was carried out by providing a more structured variety of sensory activities, increasing the intensity of individual assistance, and providing more consistent reinforcement. The results of the implementation of Cycle II showed a more significant and stable increase in pre-writing skills. At the end of Cycle II, SZS students achieved a percentage of pre-writing ability of 75%, while NSS students reached 88%. In addition to increasing scores, students also showed positive development in aspects of independence, accuracy of hand movements, eye and hand coordination, and increased focus and concentration during learning activities.

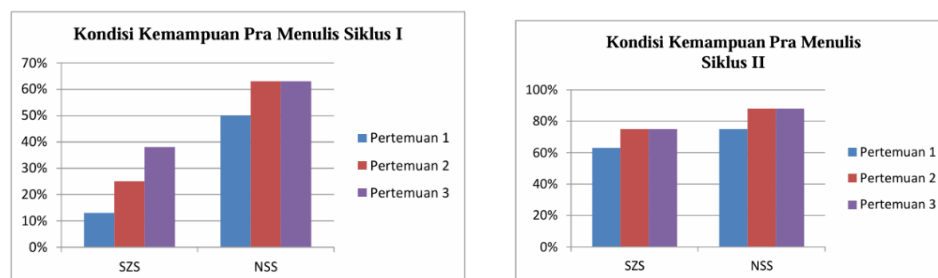


Figure 2. Graph of conditions in cycles I and II

## Discussion

Pre-writing learning with the sensory Montessori method for students with mild intellectual disabilities in grade III at SLB Negeri Simalungun is carried out through structured and gradual stages, and oriented towards direct learning experiences. The learning process is designed to provide repetitive, concrete, sensory-motor stimulation that is tailored to the individual characteristics and needs of students. The application of this method allows students to learn through the activity of touching, tracing, and manipulating media, so that writing readiness is not built instantly, but through a systematic process.

In Cycle I, students' pre-writing skills are still at an early stage and have not shown optimal results. Students have difficulty tracing lines, forming simple patterns, and coordinating hand movements stably. The activity of thickening the line and making the baseline still requires intensive guidance because the students are not used to systematic sensory-motor activities. This condition shows that students' fine motor skills and eye-hand coordination are still developing and require more consistent stimulation.

The analysis of the results of Cycle I indicated that the limitation of hand movement control was caused by low eye-hand coordination, suboptimal finger strength, and lack of learning experience involving direct sensory stimuli. Therefore, learning actions are focused on providing repetitive exercises through sensory props, direct assistance, and manipulative

activities involving the five senses. This finding is in line with the opinion (Purwaningsih DLL, 2024) which states that students with intellectual barriers need fine motor stimulation that is carried out gradually and repeatedly through structured learning approaches, such as the Montessori method, so that writing readiness can develop optimally.

Learning improvements were carried out in Cycle II by designing more targeted and consistent pre-writing activities using kinetic sand media as a tactile sensory means. Through touching, pressing, shaping and tracing patterns on the kinetic sand medium, students have the opportunity to practice hand movements naturally and repeatedly. Individual assistance is also provided to help students overcome difficulties that still arise, as well as strengthen students' confidence in participating in learning activities.

The results of Cycle II showed a more stable increase in pre-writing ability compared to the previous cycle. Students are able to thicken lines with better control, mimic simple shapes more neatly, and show more directed hand movement coordination. This improvement shows that sensory stimulation through kinetic sand media is effective in developing fine motor skills as the basis of pre-writing ability. This finding is supported by research (Suratin and Aulina, 2025) which states that the use of kinetic sand media is able to significantly improve students' eye-hand coordination and fine motor skills through a gradual learning process.

In addition, the use of concrete media and manipulative activities provides a meaningful hands-on learning experience for students. Sensory media allows students to understand basic pre-writing movements through sensory exploration, so that the learning process is not only mechanical, but also involves the active involvement of students. This is in line with the findings (Setyaningrum DLL, 2024) which states that a variety of media and pre-writing activities are able to gradually improve students' fine motor skills in each learning cycle.

The improvement of pre-writing skills in Cycle II is also strengthened by findings (Suriadi, 2023) which show that sensory-motor activities, such as educational games and manipulative activities, play an important role in improving accuracy, finger strength, and hand coordination of students with disabilities. The learning results in Cycle II showed an increase in pre-writing skills that was more stable and controlled than Cycle I. In the process, students appeared more focused, were able to follow the flow of activities better, and showed increased confidence. As a result, students are able to thicken lines with better movement control, mimic simple shapes more neatly, and show more directed hand coordination. These findings show that the sensory Montessori method with kinetic sand media is effective in developing fine motor skills as the basis of pre-writing skills.

The effectiveness of the method showed that the use of kinetic sand media was able to significantly improve students' eye-hand coordination and fine motor skills through gradual learning. The tactile stimuli resulting from sand play activities help students better control hand movements and reduce tension when doing pre-writing activities. The use of concrete media and manipulative activities in sensory Montessori learning provides a meaningful learning experience for students. Students not only practice mechanical imitation of movement, but also build understanding through exploration of the senses.

Overall, a comparison of processes and outcomes between Cycle I and Cycle II showed that pre-writing learning designed in a planned, reflective and responsive manner through sensorial Montessori methods had a significant positive impact. The use of kinetic sand media as a tactile sensory means has been proven to be effective in improving the learning process, overcoming obstacles that arise in the early stages, and strengthening the writing readiness of students with mild intellectual disabilities.

## CONCLUSIONS

Based on the results of the Classroom Action Research (PTK) carried out in two cycles, it can be concluded that the application of the sensory Montessori method with the systematic and continuous use of manipulative media is effective in improving the pre-writing ability of students with intellectual disabilities in class III. The improvement in these abilities was seen gradually from Cycle I to Cycle II, especially in the skills of tracing lines, thickening and

imitating simple patterns, as well as fine motor coordination that was increasingly controlled. In addition to improving skill aspects, the learning process based on sensory stimulation and fine motor activities also has a positive impact on student involvement in learning activities. Students show increased confidence, focus, and motivation in participating in pre-writing activities, so that the learning process takes place more actively and meaningfully. The results of the final assessment show that all students have achieved the set completion criteria, so it can be affirmed that the sensory Montessori method is an effective and relevant approach in developing pre-writing skills for students with intellectual disabilities.

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