PROCEEDING
International Conference in Education and Vocation: Multicultural and Inclusive Approaches
ICEV-MIA 2026

THE EFFECTIVENESS OF VISUAL-MOTOR INTEGRATION TRAINING ASSISTED BY CLEAN RULER IN IMPROVING HANDWRITING SKILLS IN CHILDREN WITH AUTISM

Qurratul 'Aini 1*

Universitas Lancang Kuning, Pekanbaru, Indonesia

*qurratulaini0213@gmail.com

ABSTRACT

This research is based on the problem of autistic children found in class III SDLB at SLB Pendowo Limo Pekanbaru, namely the problem of handwriting skills. This research aims to find out the effectiveness of the clean ruler-assisted motor visual integration exercise in improving the handwriting skills of autistic children at SLB Pendowo Limo Pekanbaru. The research uses a Single Subject Research (SSR) design with the A1–B–A2 method, including the first baseline (A1), intervention (B), and the second baseline (A2). The research subject is an autistic child who shows difficulty writing neatly. The data was collected through handwriting skill observation sheets by Yusuf, (2003) and analyzed quantitatively descriptively, including the Percentage of Non-Overlapping Data (PND) calculation to assess the effectiveness of the intervention. The research results showed an increase in handwriting skills from 0% on the first baseline (A1) to 90% on the second baseline (A2). The PND calculation shows 100%, which confirms that the Clean ruler-assisted motor visual integration exercise is very effective in improving the handwriting ability of autistic children. Children also become more responsive and interested in writing activities. It can be concluded that the motor visual integration exercise with the help of clean ruler is effective in improving the handwriting skills of autistic children at SLB Pendowo Limo Pekanbaru

Keywords : Autistic children, Clean rulers, Handwriting skills, Visual motor integration exercises.

1. INTRODUCTION

Writing is an activity that someone does to express ideas and thoughts in written form, allowing the writer to be more focused, less rushed, and feel free to express themselves. Although for some people writing feels easy (Kiuk et al., 2021) , for others, writing is considered a difficult activity, including for autistic children.

Autistic children are individuals who require special attention and treatment because they experience certain developmental disorders or abnormalities that result in limitations in one or several aspects of ability, both physical and psychological (Rezieka et al., 2021) . According to Yahya et al., 2023 autism is a developmental disorder of the nervous system that

is included in Autism Spectrum Disorder (ASD) and Pervasive Developmental Disorder (PDD), caused by genetic brain function disorders and not mental illness, which causes sufferers to have difficulty communicating, understanding other people's feelings, and adjusting to the social environment so that they appear to live in their own world and tend to ignore or reject the presence of others.

According to data from the 2024/2025 Special School (SLB) Statistics document published by the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek), there are 18,700 autistic students in Indonesia. Meanwhile, in Riau Province, the number of autistic students reached approximately 696 in the 2024/2025 academic year. These data indicate that the need for special education services and appropriate learning support for autistic children on the autism spectrum remains quite high, both at the national and regional levels.

Autistic children often experience difficulties in fine motor skills, which are characterized by difficulties in holding a pencil, using scissors, writing, and carrying out various manipulative activities that require hand and eye coordination (Rochmah, et al. 2024). This condition can affect autistic children's learning outcomes, their participation in various activities, and lower their self-confidence. Autistic children who have difficulty writing or have a low interest in learning tend to have difficulty expressing themselves and lack confidence in their surroundings (Anjani et al., 2025) .

Children with autism generally experience difficulties in mastering and processing language, as well as in understanding information and organizing it into structured words. This impacts their writing skills (Saddler et al., 2016) . Furthermore, many children with autism also experience difficulties in fine motor control, which directly impacts their handwriting skills, particularly when writing on paper (Saddler et al., 2016).

Based on the results of observations on April 23, 2025 with the teacher of class III SDLB at SLB Pendowo Limo, it was obtained information that a child with the initials M, aged 9 years, female, had difficulty in writing, especially in neatness and accuracy in writing, the teacher tried to maximize the student's ability by practicing writing in each subject given using pencil grip media by helping the child hold a pencil using media that is useful for improving neatness, starting from connecting dotted lines, as well as copying a word, in this activity the child's attention was only for a short time because the media used was not comfortable, when asked to repeat the child refused, based on the results of observations and initial assessments carried

out on April 24, 2025, it was seen that the child showed obstacles in writing skills, especially neatness, where the child wrote outside the lines in the notebook so that the child's writing was large and irregular. This was because the child did not understand the concept of writing neatly following the lines in the notebook, and was impatient in doing his assignments, based on the results of the researcher's observations the child's academic abilities experienced obstacles, especially in the neatness of his writing.

This aligns with Ling and Ahmad's (2023) statement that autistic children who experience handwriting difficulties and write slowly require interventions that emphasize visual-motor integration exercises. In this context, the use of these exercises is one activity that can help autistic children overcome obstacles in writing. One way to improve the problems of autistic children is through visual-motor integration exercises. Therefore, researchers want to try using visual-motor integration exercises to test their effectiveness when used in writing activities in each subject.

Visual-motor integration training is a learning method that emphasizes the integrated use of visual stimuli and fine motor activities, allowing children to learn by combining vision and hand-finger movements (Taverna et al., 2020) . This training is designed to help children develop the ability to combine visual perception with fine motor movements, which is an important foundation for handwriting skills (Beery and Beery, 2010).

Furthermore, the application of visual-motor integration exercises has been shown to support the development of fine motor skills, visual perception, and children's overall manipulative abilities (Cameron et al., 2012) . This concept is based on the principle of visual-motor integration, which shows that coordination between visual and motor skills plays a crucial role in children's learning and academic achievement (Taverna et al., 2020). Therefore, the use of visual-motor integration exercises in children's education, including in children with autism, can improve the effectiveness of handwriting skills and other manipulative activities (Cameron et al., 2012).

Osama et al., (2024) stated that visual motor integration activities with handwriting skills in early childhood have a strong relationship. This is in line with the opinion of Ling and Ahmad, (2023) who discussed the success of handwriting skills in visual motor integration activities stating that visual motor skill training is effective not only in coordinating visual and motor skills but also in the memory of autistic children with handwriting problems.

A clean ruler is a clear, tactile visual aid designed to help children, especially those with autism, maintain neat writing by providing clear boundaries for the writing area. This tool works by acting as a line divider , allowing children to focus more easily, control letter position, maintain the proportions of the writing, and reduce visual distractions during writing. *A clean ruler* is a simple media innovation that supports graphomotor skills, particularly visual motor skills and motor planning when copying or writing letters.

Based on the explanation above, visual motor integration training assisted by *a clean ruler* can improve writing skills, however, there are still few who implement the clean ruler in autistic children. Therefore, researchers are interested in seeing whether visual motor integration training assisted by a *clean ruler is effective* in improving handwriting in autistic children. So the researchers took the title "Effectiveness of Visual Motor Integration Training Assisted by *a Clean Ruler* on Improving Handwriting Skills in Autistic Children". With this training, it is hoped that it can increase effectiveness in writing skills, changing the learning atmosphere that was previously less interesting for autistic children to be more enjoyable. This aims to arouse autistic children's interest in learning and help them improve their writing skills, especially in the neatness of their handwriting.

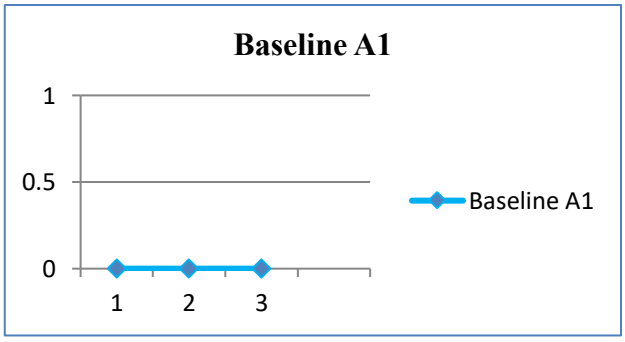
2. METHODOLOGY

This study used a quantitative approach with the Single Subject Research (SSR) method to test the effectiveness of visual motor integration training assisted by *a clean ruler* on improving handwriting skills in children with autism. The design used was ABA, consisting of the first baseline phase (A1), intervention (B), and the second baseline (A2). In phase A1, initial capability measurements were carried out without treatment until the data was stable. Phase B is the stage of providing structured and repeated interventions accompanied by continuous measurement. Next, phase A2 is carried out to see the continuity of changes after the intervention is stopped so that the functional relationship between the independent and dependent variables can be analyzed more clearly.

The study was conducted at Pendowo Limo Special Needs School in Pekanbaru, with five weekly meetings lasting 25 minutes each after class. The subject was a 9-year-old female child with autism, identified as M, who had difficulty with handwriting. Subjects were selected according to the characteristics of the SSR design which focuses on analyzing individual behavioral changes.

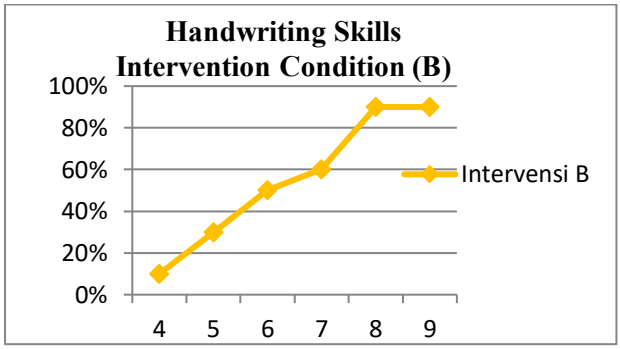
3. RESULTS

In the baseline phase (A1), observations were conducted in three meetings on 11–13 December 2025 to identify the subject's initial abilities before being given intervention. Observation results show that children's handwriting skills are still at a very low level. The subject experienced difficulty in controlling writing tools, the direction of hand movements was not yet controlled, and he was not yet able to imitate letter shapes and copy words correctly. The writing produced is not neat, marked by inconsistent letter sizes, irregular spacing between letters, and writing that does not follow the lines in the notebook. During the three meetings, there was no visible change or increase in ability, so that the percentage of skills acquired remained at 0%, which indicates that the initial condition was in the very low and stable category.



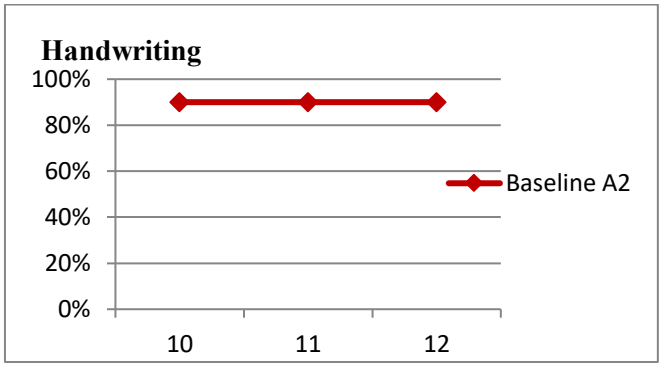
Picture 1. Graph of Baseline A1 handwriting skills

In the intervention phase (B), observations were conducted over six meetings on December 15–24, 2025, with the provision of visual motor integration exercises assisted by *a Clean ruler* . The intervention was implemented through copying activities of letters, words, and names provided on worksheets. The results showed a gradual increase in ability at each meeting. The percentage of handwriting skills increased from 10% at the first intervention meeting to 30%, 50%, 60%, and reached 90% at the fifth and sixth meetings. Improvements were seen in the ability to hold writing tools independently, copy letters and words more accurately, write one's own name , and maintain the alignment of writing following the lines with the help of *a Clean ruler* . Although there were still slight obstacles in vertical movement control and uniformity of letter size, overall the data showed an increasing trend and approached stability at the end of the intervention phase.



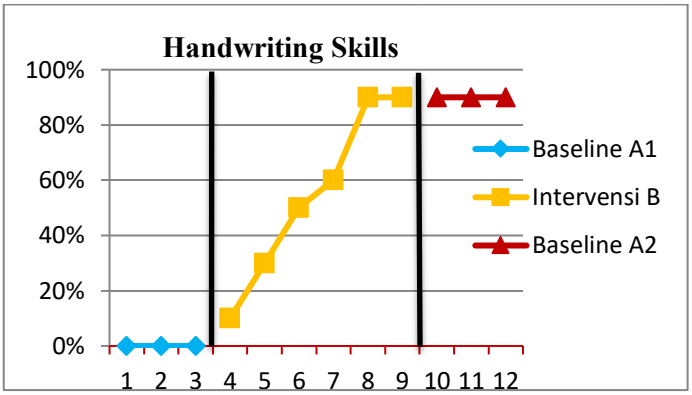
Picture 2. Figure skills Ability Intervention Condition (B)

In the second baseline phase (A2), observations were conducted in three meetings on 29–31 December 2025 to measure the child's abilities after being given intervention. Observation results at the tenth, eleventh, and twelfth meetings showed that most handwriting skill indicators had been achieved well. The child was able to hold the writing tool correctly, follow instructions, and complete writing tasks using *the Clean ruler* quite neatly. However, in the indicator of moving the writing tool to the left and right stably, the child still experienced slight instability so that the writing results were not completely consistent. Overall, at the three meetings of phase A2 the child was able to fulfill 9 of the 10 skill indicators, with a consistent achievement percentage of 90%, which indicates that writing skills remained stable after the intervention was given.



Picture 2. Handwriting Skills Ability Baseline Condition (A2)

Based on the data and conditions of each meeting, the researcher can visualize this information in the following graph.



Picture 3. Review Of Handwriting Skills In Baseline (A1), Intervention (B), And Baseline (A2) Conditions

Based on Graph 4.4, the first condition (A1) was implemented in three sessions, namely sessions 1 to 3, with a percentage score of 0% and showed a stable tendency. In the intervention condition (B) which lasted for six sessions, namely sessions 4 to 9, handwriting skills experienced a gradual increase until reaching stable data of 90% in sessions 8 and 9. Furthermore, in the second condition (A2) which was implemented in three sessions, namely sessions 10 to 12, the percentage score remained at 90% and showed a stable condition.

a. Non-overlapping data

1) Non-overlapping data on baseline (A1) and intervention (B)

To find out the non-overlapping data at the baseline (A1) and intervention (B) stages, this can be done in the following way .

a) Upper and lower limits at baseline conditions (A1)

Upper limit = 0

Lower limit = 0

b) The number of data points obtained in the intervention condition (B) that are outside the baseline data range (A1) = 6

c) Number of data in intervention condition (B) = 6

Percentage of non-overlap = 6 : 6 x 100% = 100%

Based on the results of the non-overlap data analysis, the non-overlap percentage between the first baseline (A1) and intervention (B) conditions was 100%, indicating that all

data in the intervention phase were outside the baseline (A1) data range. Based on the effectiveness interpretation criteria, this percentage indicates that the visual motor integration training assisted by *the clean ruler* is classified as very effective.

4. Discussion

In this study, the transition from baseline A1 to intervention conditions was improved due to repeated visual-motor integration exercises using a *clean ruler* and appropriate reinforcement, resulting in improved handwriting skills. In the baseline A2 phase, children's abilities remained stable with high scores, even though the intervention had been discontinued. This finding indicates that the effects of the intervention persisted after implementation. This finding aligns with Prahmana's (2021) opinion that repeated practice under stable conditions can strengthen skills trained in single-subject research.

The results of this study indicate that visual motor integration training assisted by *a clean ruler* has a significant impact on improving handwriting skills in children with autism. This study indicates that previously underdeveloped handwriting skills can be improved through interventions that specifically stimulate coordination between visual and fine motor skills. This finding is in line with the opinion of Feder and Majnemer, (2007) who stated that handwriting skills are strongly influenced by visual motor integration abilities, especially coordination between visual perception and fine motor control. In addition, Case-Smith and O'Brien, (2013) explained that providing interventions that structuredly stimulate the relationship between vision and hand movement can help children with developmental disabilities, including children with autism, in improving their graphomotor skills. Thus, handwriting skills that previously have not developed optimally can be improved through interventions specifically designed to train visual and fine motor coordination in an integrated manner.

The improvement in children's abilities is also in line with the opinion of Ling and Ahmad (2023) that visual motor integration training can help improve children's handwriting skills, because the training trains coordination between visual perception and hand movements in a directed manner, so that children are able to produce more organized and neat writing. This shows that consistent, repeated visual motor integration training, based on giving rewards in the form of "high fives," can help children improve their handwriting skills.

The effectiveness of visual-motor integration exercises in improving handwriting skills in autistic children in this study aligns with the opinion of Rosenblumÿ et al., (2019) that autistic children often experience difficulties in visual-motor coordination, which impacts neatness, direction, and legibility of writing. Exercises that stimulate visual-motor integration can help reduce these obstacles and support handwriting performance.

he had technically demonstrated an appropriate grip and did not experience significant motor impairments. The problem that emerged was more of an inconsistency in writing performance, as evidenced by fluctuations in letter size, pressure, and the accuracy of the writing's position relative to the line. This inconsistency indicates that children's responses to writing activities vary depending on their internal conditions. This phenomenon can be analyzed through the Rational Emotive Behavior Theory (REBT) proposed by Ellis (1962) , which explains that behavioral consequences (C) are not directly caused by events (A), but rather by the individual's beliefs or assessments of those events (B). In this context, writing activities as events do not necessarily produce stable writing, because when children interpret mistakes or difficulties negatively, their emotional responses and focus can change, thus affecting hand movement control. Therefore, the inconsistencies that occur are not solely due to motor weaknesses, but are influenced by the cognitive and emotional processes that accompany the writing task, so that interventions are needed that not only train visual motor coordination but also help stabilize children's behavioral responses during the learning process.

In the first intervention session, the subject showed an improvement in one indicator, namely the ability to hold a writing tool, with a score of 10%. This initial improvement can be understood as a result of the pencil holding practice that was conducted previously outside the research intervention series. These exercises contribute to improving fine motor readiness and help children adjust basic positioning and control when holding writing tools. From the perspective of behaviorist theory proposed by Skinner (1965) , behavior can begin to form through repeated practice and habituation, because each stimulus given will strengthen certain responses. Thus, improvements in the first intervention indicate an initial positive response to the exercises given, while also laying the foundation for the development of writing skills in subsequent sessions.

In this study, children showed interest in writing activities as one of their favorite activities. When a child's interests align with the media used, the learning process becomes

more optimal and results are improved. Interest in learning is an internal factor that significantly influences learning success, as Slameto (2015) notes that interest can improve student concentration and learning outcomes.

This study used a tool called *a clean ruler* to assist in implementing the intervention . This *clean ruler was very helpful in* the research process because it was a new tool never used before by the children in the study. This sparked curiosity and interest in the children, increasing their attention and motivation when writing. Autistic children tend to be more responsive to visual stimuli and concrete objects that differ from their daily learning routines. This is in line with the opinion of Hume et al. (2014) , who stated that concrete visual media can increase autistic children's focus and engagement in learning activities.

Children with autism tend to show greater interest in learning that involves the use of media, especially visual and structured media. Based on these characteristics, this study chose *clean ruler media* as a form of intervention because this media provides clear visual boundaries and structures that help children focus attention and understand writing activities better. Children's interest in using media during learning also increases their involvement and consistency in participating in writing activities, thus having a positive impact on the development of handwriting skills. This shows that the use of visual media makes children with autism more responsive and interested in learning activities, as explained by Odom et al., (2010) that visual aids are one of the effective evidence-based practices to increase the involvement and participation of children with autism in learning. Therefore, the use of *clean ruler media* can be said to be effective in supporting the process of learning to write in children with autism.

In the intervention phase (B), the use of *clean ruler media* in this study applies the fading technique, namely the gradual reduction of assistance so that students do not become dependent on aids . In the initial session, *the clean ruler* is used fully to help children maintain writing boundaries, letter size, and neatness, then systematically reduced assistance with a removable system until the child is able to write without media. According to Cooper et al., (2007) the fading technique is part of the principles of Applied Behavior Analysis which aims to maintain established behavior even though the stimulus assistance is removed. According to Cooper et al., (2007) fading is a procedure for gradually reducing prompts so that responses continue to emerge independently. In line with that, Kronfli and Dezayas, (2024) emphasized that systematic reduction of assistance can increase independence and maintain skills that have

been learned. Thus, the improvement in handwriting skills seen in the intervention phase shows that the effectiveness of *the clean ruler* lies not only in its function as a visual aid, but also in the application of the fading technique that allows these skills to be internalized and develop independently.

In the second baseline phase (A2), there was a variation in achievement between sessions, where in the 10th session the subject was not yet able to move the writing tool to the left and right stably, whereas in the 11th session this ability reappeared. However, in the 11th and 12th sessions, the subject was still unable to maintain neatness of writing, especially in maintaining uniformity of letter size. This pattern shows that basic motor skills have actually been acquired, but their consistency is not yet completely stable and is still influenced by situational conditions during the learning process. These performance variations can be understood as the impact of environmental factors that influence attention, as children with autism tend to have difficulty maintaining focus and are easily distracted by surrounding stimuli. This aligns with the explanation (Attwood, 2006) that individuals with autism often exhibit fluctuations in concentration and responsiveness when there are changes or additional stimuli in the learning environment. Therefore, the differences in achievement between the 10th, 11th, and 12th sessions reflect variations in attention levels due to environmental influences, rather than the loss of previously acquired skills.

Based on the results of the study conducted in less than one month, the subjects showed significant improvement in handwriting skills, as indicated by increased consistency of letter size, accuracy of writing position on the line, and stability of pressure when writing in the intervention phase compared to the initial baseline phase. This improvement in a relatively short time indicates that structured and repeated exercises are able to form more adaptive behavioral responses. This is in line with Albert Ellis's view in the Rational Emotive Behavior theory which states that individual behavioral responses are influenced by cognitive processes and can change through consistent learning experiences (Ellis in Corey, 2013). In addition, the behaviorist approach proposed by Skinner (1965) emphasizes that behavior can be formed and strengthened through repeated practice and systematic reinforcement. Thus, the improvement in handwriting skills in less than one month indicates that visual motor integration exercises assisted by *clean ruler media* are effective because they provide clear visual stimuli and consistent habituation in the learning process.

The results of the study showed that the improvement of children's handwriting skills was significantly influenced by the use of *clean ruler media* as a structured visual aid . The success achieved was not solely due to repeated practice, but because the media provided concrete support that helped children control the space and direction of writing more consistently. This finding is in line with the scaffolding theory within the Zone of Proximal Development (ZPD) framework proposed by Vygotsky and Cole, (1978) , which states that children can achieve higher levels of ability when they receive assistance or support that suits their needs. In the context of this study, *clean rulers* act as a form of visual scaffolding that provides clear boundaries and structures, so that children are able to maintain consistent hand movements when writing. With this support, visual motor control becomes more stable, and gradually children are able to show improvements in writing performance that are more focused and neat. This confirms that media is a major component that influences the success of interventions.

This study shows that the application of visual motor integration exercises assisted by *a clean ruler* is effective in improving handwriting skills in autistic children. These results are in line with the opinion of Mesibov et al., (2005) , who emphasized that autistic children tend to learn better through visual media, because visual media helps them understand instructions more clearly, increases focus and engagement, and supports visual motor coordination which is important in handwriting. Thus, the use of *a clean ruler* as a visual aid provides concrete support for autistic children to develop writing skills more optimally.

Overall, the results of this study indicate that the application of visual motor integration exercises assisted by *a clean ruler* is effective in improving handwriting skills in children with autism. This finding is in line with previous theories and research that emphasize that structured learning, consistent practice, reward provision, and visual media support are appropriate strategies for developing graphomotor skills in children with autism. Therefore, visual motor integration exercises assisted by *a clean ruler* can be recommended as an effective intervention to help children understand the boundaries of writing, improve visual motor coordination, so that their writing skills become neater and more focused.

5. CONCLUSION

Based on the research conducted, it can be concluded that visual-motor integration training with the aid of *a clean ruler* is effective in improving handwriting skills in children with

autism. This is evident in the changes in children's writing skills, which initially were not optimal, to more focused, controlled, and neat after the intervention. This development shows that providing structured exercises with the support of visual media can help children coordinate visual and fine motor aspects during writing activities.

The results of the data analysis show that in the first baseline condition (A1), children's handwriting skills are in the very low category with an achievement percentage of 0%. After being given visual motor integration training assisted by *a clean ruler* , there was a significant increase in ability until in the second baseline condition (A2) the achievement percentage reached 90%. The comparison between the initial and final conditions shows a clear increase, so that the use of *a clean ruler* as a visual aid with concrete writing boundaries can be declared effective in supporting the regularity, consistency of letter size, and neatness of autistic children's writing.

6. REFERENCE

Anjani, AU, Taufan, J., & Yulia, Y. (2025). *The Effectiveness of Using Touchtrails Media in Improving Beginning Writing Skills in Children with Autism Spectrum Disorders. The Effectiveness of Using Touchtrails Media in Improving Beginning Writing Skills in Children with Autism Spectrum Disorders* . *5* (2), 678–691.

Attwood, A. (2006). *The complete guide to Asperger's syndrome* . Jessica Kingsley Publishers.

Beery, K. E., & Beery, N. A. (2010). *The Beery-Buktenica Developmental Test of Visual-Motor Integration. Beery VMI: With Supplemental Developmental Tests of Visual Perception and Motor Coordination and Stepping Stones Age Norms From Birth to Age Six. Administration, Scoring, and Teaching Man* . Pearson.

Cameron, C.E., Brock, L.L., Murrah, W.M., Bell, L.H., Worzalla, S.L., Grissmer, D., & Morrison, F.J. (2012). Fine motor skills and executive function both contribute to kindergarten achievement. *Child Development* , *83* (4), 1229–1244.

Case-Smith, J., & O'Brien, J. C. (2013). *Occupational therapy for children-E-Book* . Elsevier Health Sciences.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (Vol. 2). Pearson/Merrill-Prentice Hall Upper Saddle River, NJ.

Ellis, A. (1962). *Reason and emotion in psychotherapy.*

Feder, K. P., & Majnemer, A. (2007). Handwriting development, competency, and intervention. *Developmental Medicine & Child Neurology* , *49* (4), 312–317.

Hume, K., Boyd, B. A., Hamm, J. V, & Kucharczyk, S. (2014). Supporting independence in adolescents on the autism spectrum. *Remedial and Special Education* , *35* (2), 102–113.

Kiuk, Y., IGW, S., & LDS, A. (2021). Efforts to Improve Writing Skills Through the Please Strategy. *Indonesian Gender and Society Journal* , *2* (1), 10–17. https://doi.org/10.23887/igsj.v2i1.39207

Kronfli, I.F., & Dezayas, L. (2024). *SPRING 2024 Syllabus For Eab 3764 Applied Behavior Analysis* . 1–12.

Ling, H., & Ahmad, A.C. (2023). *Improving autistic students' visual – motor skills through handwriting intervention* . *3* (1), 23–38.

Mesibov, G. B., Shea, V., & Schopler, E. (2005). *The TEACCH approach to autism spectrum disorders* . Springer Science & Business Media.

Odom, S.L., Collet-Klingenberg, L., Rogers, S.J., & Hatton, D.D. (2010). Evidence-based practices in interventions for children and youth with autism spectrum disorders. *Preventing School Failure: Alternative Education for Children and Youth* , *54* (4), 275–282.

Osama, K., Amanah, N., Kurnia, A., & Nurdiansah, N. (2024). *The Relationship between Visual Motor Integration Activities and Handwriting Skills in Early Childhood* . *4* , 132–165.

Prahmana, RCI (2021). Single Subject Research (theory and its implementation: an introduction). *Journal of Chemical Information and Modeling* , *53* (9), 1689–1699.

Rezieka, DG, Putro, KZ, & Fitri, M. (2021). Factors Causing Children with Special Needs and Classification of Children with Special Needs. *Bunayya: Journal of Child Education* , *7* (2), 40–53.

Rosenblumÿ, S., Ben-simhon, H.A., Meyer, S., & Gal, E. (2019). *Predictors of handwriting performance in children with autism spectrum disorder* . *60* , 16–24.

Saddler, Kristie Asaro; Arcidiacono, Mary Beth & Deyoe, M. M. (2016). Instructional Practice for Students with Autism Spectrum And Related Disorders: Exploring The Teaching Of Writing In Two Self-Contained Classrooms. *Reading & Writing Quarterly.*

Skinner, B.F. (1965). *Science and human behavior* (Issue 92904). Simon and Schuster.

Taverna, L., Tremolada, M., Tosetto, B., Dozza, L., & Renata, Z. S. (2020). Impact of psycho-educational activities on visual-motor integration, fine motor skills and name writing among first graders: A kinematic pilot study. *Children* , *7* (4), 27.

Vygotsky, L. S., & Cole, M. (1978). *Mind in society: Development of higher psychological processes* . Harvard university press.

Yahya, RE, Anatarsya, AA, Anayansya, AA, Gunarto, K., & Maruti, ES (2023). Understanding Autistic Children and the Application of Learning Models. *SENASSDRA 48th National Seminar on Social Sciences, Education, Humanities (SENASSDRA* , *2* (2), 48–58.