

The Effect of Brain Gym *Double Doodle* on Improving the Writing Ability of Tunagrahita Students at SD Al-Firdaus Surakarta

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ABSTRAK

The subject had difficulty in thickening letters, letters were thickened out of line, not outlined, and not neat. In addition, in making vertical, horizontal, and wavy straight lines, this study aimed to determine the effect of brain gym double doodle on improving the ability to write beginnings in students with disabilities at SD Al-Firdaus Surakarta. The subject of the study was a grade 1 student at SD Al-Firdaus Surakarta who struggled with writing thick letters and neatness. A quantitative research approach using a single subject design experimental method was employed, following the A-B-A model. Data was collected through a written test of 20 questions and analyzed using tables and graphs. Reliability test results using SPSS 29 obtained 0.759, meaning a high level of agreement between raters. The reliability test indicated a high level of agreement between raters. The findings revealed that the mean level of writing in the baseline-1 phase was 45, which improved to 83 during the intervention phase (B), and then dropped to 78 in the baseline-2 phase (A2). Based on the results, it could be concluded that brain gym double doodle had a positive effect on the writing abilities of students with disabilities at SD Al-Firdaus Surakarta.

Keywords: *brain gym, double doodle, write beginnings, mental retardation*



PENDAHULUAN

Tunagrahita were children who had below-average intelligence levels characterized by limited intelligence and inadequacy in social adaptation (Suharsiwi, 2017). Physically, tunagrahita were almost the same as other children, but as a result of their limited intelligence, tunagrahita had limited ability to absorb, capture, process concepts and information. During the learning process, sufficient concentration was needed; less than 10 minutes meant that the child had not been able to concentrate well. Tunagrahita had such concentration problems. The difficulty of concentration came from central nervous structure disorders and low intelligence (Musdalifah, 2019).

Limited intelligence also affected the low level of fine motor skills. Fine motor skills were abilities that involved the small muscles of the hands and fingers. The use of small muscles such as taking small objects, grabbing objects, squeezing, holding large or small objects, and writing (Suriadi, 2023). Fine motor limitations had an impact on the learning process, one of which was writing. Writing activities required eye and hand coordination, finger movements, and hands (Adiatama, et al, 2023). There were two basic abilities in writing, namely intellectual ability and motor ability. Intellectual abilities included the ability to describe shapes and symbols. Motor skills included the ability to use small muscles related to eye and hand coordination adaptively, efficiently, and precisely. According to Sudrajat & Jarwadi (2019), writing activities were divided into 3 stages: pre-writing, beginning writing, and advanced writing.

Reading Writing Beginnings (MMP) was a program that was prioritized for students at the beginning of school; this ability would be a basic ability in other fields of science (Mustikowati, et al, 2016). Beginning writing aimed to enable students to write with proper spelling, easy to read, and understand. Not all primary grade students were easy to write, especially students with disabilities. Some of the errors in beginning writing for students with disabilities included holding a pencil incorrectly, difficulty in writing letter symbols, and writing that did not resemble the actual shape of the letters (Dasmia, 2016). Writing was not easy for people with disabilities; therefore, brain gym could be one approach in improving the writing skills of students with disabilities.

Brain gym was a variety of movements involving easy and fun limbs that could activate parts of the child's brain to provide better learning outcomes and experiences (Adenikheir, 2021, 547). Brain gym could also improve fine motor coordination, make learning more comfortable and fun, clear the mind, and improve brain understanding (Budiarti and Nora, 2020, 98). Ningrum, et al (2018) explained that brain gym was more effective in improving the ability to write beginnings in children with disabilities. The results of the study obtained the average value of students at the time of the pre-test was 60, while the average post-test value was 93.33, so it could be concluded that brain gym had an effect in improving the ability to write the beginnings of children with disabilities. Zulaini (2017) there were many brain gym movements including cross crawl, number 8 sleep movement, double doodle movement, Alphabet 8, Elephant, Neck Round, hip rotation (the rocker), abdominal breathing, and filling energy. In this study, we used the brain gym type of double doodle. Double doodle was one of the brain gym movements that used both hands to draw simultaneously (Wardani, 2014).

Based on the results of initial observations, it was found that students had problems in writing their beginnings. Students' writing behavior tended to bring their heads closer to the table, slouching, lacking confidence in their abilities, often moving aimlessly, and having low concentration levels. When writing, children needed to be lured using nouns that began with the letter in question. For example, the letter "P" then the teacher had to say the object that began with the letter "Banana" so that the child could remember and write the letter "P". In addition, in writing the pattern outlined, students went outside the predetermined pattern in making straight and curved lines, thickening lines down, up,

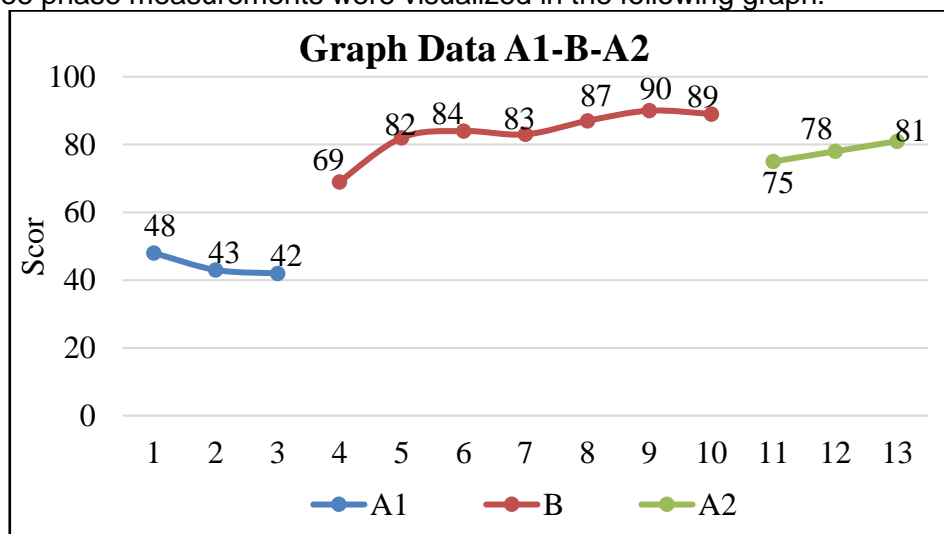
left, and right, and thickening circles and wavy lines. The child could bold letters but not according to the predetermined pattern. The difficulty was due to stiffness in fine motor skills. From these problems, the teacher had not provided special interventions that were fun and varied related to writing beginnings, one of which used brain gym double doodle. This study aimed to determine the effect of double doodle brain gym on improving the ability to write the beginnings of tunagrahita students at SD Al-Firdaus Surakarta.

METODE

This type of research was quantitative with Single Subject Research (SSR). The design used was A1-B-A2. Data collection methods included a written test of 20 questions. Research instruments for beginning writing skills included indicators of connecting dots, drawing lines, and thickening letters. Based on the calculation results using Aiken's V, $V = 0.92$ was obtained, so it could be concluded that the validity test results were very valid. The ICC reliability result obtained was 0.759, meaning a high level of agreement between raters. Data analysis was conducted using descriptive statistical analysis presented in the form of tables and graphs..

HASIL DAN PEMBAHASAN

This study was conducted in 3 phases consisting of 13 sessions or meetings. The baseline-1 (A1) phase of the activity was carried out for 3 sessions, which were initial measurements of beginning writing skills. The intervention phase (B) was the provision of double doodle intervention, which was carried out for 7 sessions. After the intervention, students' beginning writing skills were measured. The baseline-2 phase (A2) was the measurement phase after the intervention was carried out for 3 sessions. The results of the three phase measurements were visualized in the following graph:









Picture 1. Graph Data A1-B-A2

Each meeting on the graph illustrated the measurement results from the baseline-1, intervention, and baseline-2 phases. The condition of the baseline-1 phase (A1) showed the results of measuring data, namely 48, 43, and 42. Then the mean level of these results was taken, namely 45, so it could be concluded that the ability to write beginnings was low. The intervention phase produced average data for each session of 69, 82, 84, 83, 87, 90, and 89. Then the result was taken as the mean level, namely 83, so it could be concluded that the ability to write the beginning was very high. The baseline-2 (A2) phase had an average of 75, 78, and 81 for each session. Then the mean level was 78, so it could be concluded that the ability to write the beginning was high. The results of

this measurement were analyzed using analysis between conditions and within conditions to conclude whether or not an intervention affected the target behavior.



The baseline-1 (A1) phase had a condition length of 3 measurements, a downward direction trend (-), data stability of 100% with an upper limit of 48 and a lower limit of 41. The data stability level and range were stable with a range of 46 - 42 and a level change of -6. The intervention phase (B) had a condition length of 7 measurements, an increasing directional trend (+), data stability of 85% with an upper limit of 90 and a lower limit of 77. Stability was met if it had reached 80% - 90% (Yuwono, 2020). The data stability level and range were stable with a range of 90 - 69 and a change in level of +20. The baseline-2 (A2) phase had a condition length of 3 measurements, an increasing directional trend (+), data stability of 100% with an upper limit of 84 and a lower limit of 72. The data stability level and range were stable with a range of 81 - 75 and a level change of -6. The results of the in-condition analysis were summarized in the following table:

Table 1. The in-condition analysis

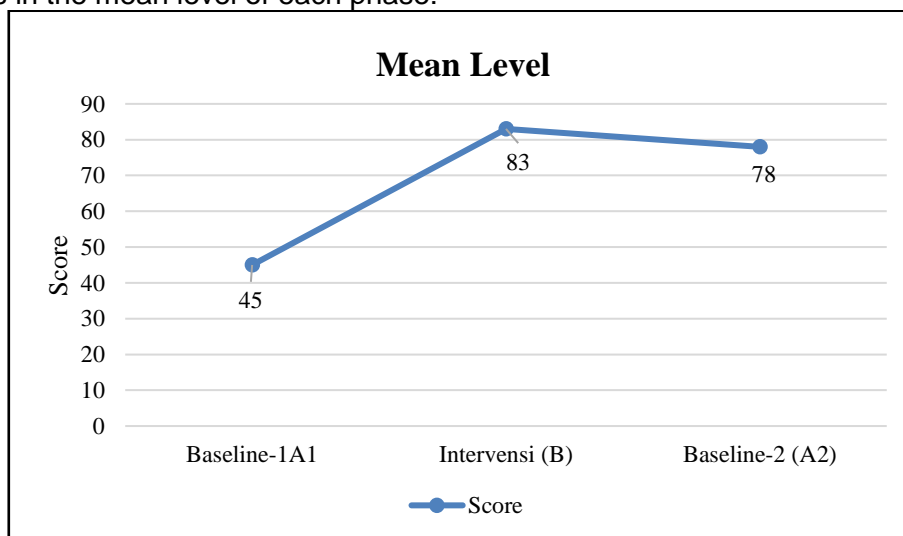
Condition	Baseline-1 (A1)	Intervensi (B)	Baseline-2 (A2)
Condition Length	3	7	3
Estimated Trend Direction	 (-)	 (+)	 (+)
Stability Trend	Stable (100%)	Stable (85%)	Stable (100%)
Data Trace Trend	 (-)	 (+)	 (+)
Stability Level & Range	Stable (46 – 42)	Stable (90 – 69)	Stable (81 – 75)
Level Change	48 – 42 (-6)	89 – 69 (+20)	81 – 75 (+6)

Analysis was conducted between conditions in the baseline-1, intervention, and baseline-2 phases. The variable that was changed in this study was only 1, namely the ability to write beginnings in the baseline-1 phase (A1) to intervention (B) and the intervention phase (B) to the baseline-2 phase (A2). The variable that was changed in A1/B was 1 measurement and in B/A2 was 1 measurement. Data on the estimation of directional tendency in the in-condition analysis was taken to determine changes in directional tendency and its effects. Changes were described in the form of flattening, decreasing, and increasing. In the A1/B condition, the change in directional tendency was increasing (+) and decreasing (-), while in B/A2 it was increasing (+) and increasing (+). Changes in stability trends in both conditions A1/B and B/A2 were stable to stable. The change in level was A1/B of +27 and B/A2 of +14. Overlap data or overlapping data indicated the level of influence of an intervention on the target ability. Overlap data baseline-1 (A1) / intervention phase (B) was 0% and overlap data baseline-2 (A2) / intervention phase (B) was 0%. The following table shows the results of the analysis in conditions:

Table 2. The analysis in conditions

Comparison	A1/B	B/A2
Variables Changed	1	1
Change in Trend Direction	 (+)	 (-)
Change in Stability Trend	Stable to Stable	Stable to Stable
Level Change	69 – 42 (+) 27	89 – 75 (+) 14
Overlap Data (%)	$\frac{0}{7} \times 100\% = 0\%$	$\frac{2}{3} \times 100\% = 67\%$

The results of visual analysis in conditions and between conditions on the results of research data on the ability to write the beginnings of students with disabilities resulted in the conclusion that there was an effect of brain gym double doodle intervention on the ability to write the beginnings of students with disabilities at SD Al-Firdaus Surakarta, which was true and acceptable. This hypothesis test was supported by the results of changes in the mean level of each phase:



Picture 2. Mean Level

Based on the results of research and analysis conducted by researchers, double doodle brain gym had a positive effect on the ability to write the beginnings of students with disabilities. This was evidenced by the increase in data obtained from the baseline-1 (A1), Intervention (B), and baseline-2 (A2) phases. In the initial measurement phase, students' difficulties lay in the difficulty in writing letters and the writing did not match the actual letters. This was in accordance with the opinion of Dasmiati (2019) that the difficulty of beginning writing skills in students with disabilities usually lay in holding a pencil incorrectly, difficulty in writing letter symbols, and writing not resembling the actual letter shape. Difficulties in writing beginnings were caused by low fine motor skills and visual abilities. The causes of low initial writing skills in tunagrahita could be caused by several factors such as low fine motor skills, low visual

abilities, and low learning motivation (Hulwah & Ahmad, 2022; Reza, et al, 2021; Irmayani, 2018).

When given the intervention, the subject's fine motor skills were better, especially in eye and hand coordination. In accordance with Demitra's (2019) opinion that brain gym could train eye vision simultaneously and eye and hand coordination. This ability was needed in the ability to write the beginning. The results of the intercondition analysis in this study showed that both A1/B and B/A2 overlap data had a percentage of 0%, meaning that double doodle brain gym provided positive changes in improving the initial writing skills of students with disabilities at SD Al-Firdaus Surakarta 2023/2024. In accordance with the results of the analysis obtained, the theory stated by Susanto (2019) that double doodle brain gym could improve the ability to write beginnings in students.

SIMPULAN

In accordance with the results of the analysis that was described by the researcher, it could be concluded that double doodle had a positive influence on the ability to write beginnings on subject D. In addition, through double doodle brain gym activities, the subject showed more enthusiasm in learning. Thus, this study had proven that double doodle brain gym had an effect on improving the initial writing skills of students with disabilities at SD Al-Firdaus Surakarta in the 2023/2024 school year. Future researchers could prove other types of brain gyms according to Susanto (2017) that brain gyms could improve reading, writing, listening, and speaking skills such as elephants, imagining the letter X, neck rotation, double doodles, alphabet 8, abdominal breathing, lying cross movements, 8 sleep, hip rotation, filling energy, and cross movements.

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