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IMPROVING FINE MOTOR SKILLS IN CHILDREN WITH MENTAL RETARDATION THROUGH LOOSE PART BASED COLLAGE ACTIVITIES

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ABSTRACT

This study aims to determine the improvement of fine motor skills of children with intellectual disabilities through loose part-based collage activities. The study used a quantitative method with an experimental design of Single Subject Research (SSR) with an A–B–A pattern on one mentally disabled child in grade I of junior high school at SLB Negeri Sri Mujinab Pekanbaru. Data were collected through observation, assessment rubrics, and documentation, then analyzed visually within and between conditions including directional tendencies, stability, level changes, and percentage overlap (POD). The results showed an increase in fine motor skills from the baseline phase (A_1) by 45%, increasing in the intervention phase (B) to 65%, and maintained in the second baseline phase (A_2) by 55%, although there were still obstacles in left hand strength and coordination when cutting. Thus, loose part-based collage activities are effective as an alternative creative learning strategy to improve fine motor skills of children with intellectual disabilities.

Keywords: Fine Motor Skills; Mentally Retarded Children; Loose Part-Based Collage; Single Subject Research

1. INTRODUCTION

Children with intellectual disabilities are children who experience obstacles at the intelligence level and therefore require special services (Amanullah, 2022). According to Indriarti (2022), mentally retarded children are children who experience mental disorders, where their intelligence level is much lower than that of children in general. Children with intellectual disabilities require special educational services, special training, and special guidance so that their mental development can be optimal (Tarigan, 2019). The definition of a child with intellectual disabilities generally has the same meaning , namely a child with a hampered level of intelligence that causes the child to experience mental disorders and require special services.

According to Mangungsong (2009), there are several groups of mentally retarded children, namely if the child has an IQ of 55-70 (Mild), IQ 40-55 (Moderate), IQ below 25-40 (Severe) and IQ below 25 (Very Severe). According to Liza et al. (2024) the classification of mentally retarded children based on their severity is divided into 4: (1) Mild: children can learn independently but still have little support, (2) Moderate: need support for learning and

carrying out daily activities, (3) Severe: Need in-depth assistance and lifelong care, (4) Very Severe: need help with life care for all daily activities. Based on the expert opinion above, it is concluded that the higher the severity of an individual's IQ, the more support and care will be needed by each individual.

Fine motor development in children with intellectual disabilities differs from that of children in general, as they experience limitations that impact their ability to perform daily activities. Fine motor skills are movements performed using small muscles or specific body parts, and they can be developed through learning and practice (Abidin et al., 2021). Examples include moving objects with the hands, drawing, stacking blocks, cutting, and writing. Children's fine motor development is closely linked to brain development. When children play , the brain receives stimulation that helps muscle development and supports fine motor skills (Hayati, 2019).

Based on the results of initial observations, there is a 12-year-old mentally retarded child at the Sri Mujinab State Special Needs School in Pekanbaru. It can be seen that the fine motor skills of mentally retarded children are still low. This can be seen from the difficulty children have in carrying out activities such as cutting, sticking, stringing, and holding writing tools correctly. This condition can hinder the development of academic skills such as writing skills, thus hampering children's daily activities such as holding a spoon and drinking. Therefore, stimulation is needed to train the subject's fine motor skills. The aim is to reduce the obstacles faced by children in both academic and daily activities. Providing appropriate stimulation is necessary to optimize the fine motor skills of children with intellectual disabilities. One of the stimuli that can improve children's fine motor skills is collage activities (Puspitasari & Zuktiar, 2018).

Collage activities are one of the activities that can improve children's fine motor skills. According to Sari (2018), collage activities can increase children's independence in carrying out daily activities and can also train fine motor skills in children. Materials for collage activities use materials such as seeds, leaves, used paper, wooden twigs, and many more. There are several ways to carry out this activity, such as planning the image to be created, providing tools and materials in advance, explaining the names of the tools used and how to use them. Explaining the correct position for sticking according to the shape of the image and demonstrating it, so that the results of the pasting do not go outside the lines. This activity must be done repeatedly so that the child's fine motor skills are trained because it includes small movements such as pinching, gluing, sticking small objects so that hand coordination is trained (Jamila & Siregar, 2025).

Several studies show that collage activities can have a positive impact on fine motor development. Moniru's (2021) research found that collage activities can help develop fine motor skills in children with mild intellectual disabilities. Through activities such as sticking natural materials such as leaves and seeds, children can practice hand-eye coordination, strengthen finger muscles, improve concentration, and prepare for initial writing skills . According to Anindayanti (2022), mosaic (collage) play therapy significantly improves the

fine motor skills of children with mild mental retardation at Tanah Bumbu State LB , South Kalimantan .

Based on the research results above, it is proven that collage activities can improve fine motor skills in children with intellectual disabilities. Although previous research has conducted this activity , it only used a single material. To avoid children getting bored, the author created a *loose-part* collage medium . This *loose-part* collage was made by utilizing natural materials found around the school environment that the children desired.

2. METHODOLOGY

The research method used in this study is a quantitative method with an experimental approach using ***a Single Subject Research (SSR) design .*** The design used is the **A–B–A pattern ,** which aims to see the effect of intervention on the fine motor skills of mentally retarded children individually. The research was conducted at SLB Negeri Sri Mujinab Pekanbaru with one subject of the research, a child with intellectual disability in grade I of junior high school who experienced obstacles in fine motor skills. In the A–B–A design, the **first Baseline phase (A_1)** was used to determine the child's initial abilities without treatment, then continued with the **Intervention phase (B) in the form of** *loose part* -based collage activities , and ended with **the second Baseline (A_2)** to see the sustainability of changes in the child's abilities after the intervention was stopped.

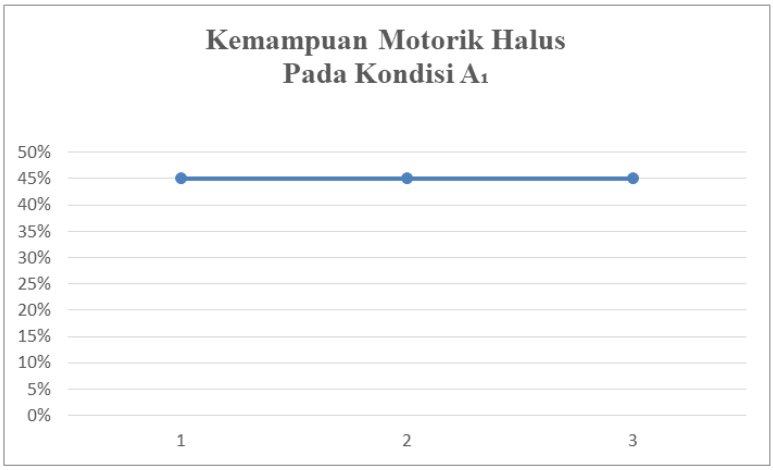
Data collection techniques were carried out through **observation, assessment rubrics, and documentation** during the research process. Observations were used to record the development of children's fine motor skills, including tearing, squeezing, cutting, applying glue, and eye-hand coordination. The data obtained were then analyzed using **visual analysis within and between conditions ,** including directional trends, data stability, level changes, and percentage overlap (POD). The analysis aimed to see the pattern of changes in children's fine motor skills at each phase of the research so that the effectiveness of *loose part*- based collage activities in improving the fine motor skills of children with intellectual disabilities could be determined.

3. RESULTS

Analysis of research results was carried out using visual analysis within and between conditions in the ***Single Subject Research*** **(SSR) design.** A–B–A pattern. Based on observations in the **first Baseline phase (A_1)** , it was shown that children's fine motor skills were still in the low category. This was evident in the children's difficulties in performing several activity indicators such as tearing, squeezing, cutting, applying glue, and eye-hand coordination during activities. At this stage, children still need help in completing tasks and the work results are not yet neat. The percentage of fine motor skills in the baseline phase (A_1) was at **45%** , which shows that the child's initial skills have not yet developed optimally.

Child's Initial Ability Table (A_1)

The th meeting	Day/Date	Percentage
1	Monday/January 5, 2026	45%
2	Tuesday/January 6, 2026	45%
3	Wednesday/January 7, 2026	45%

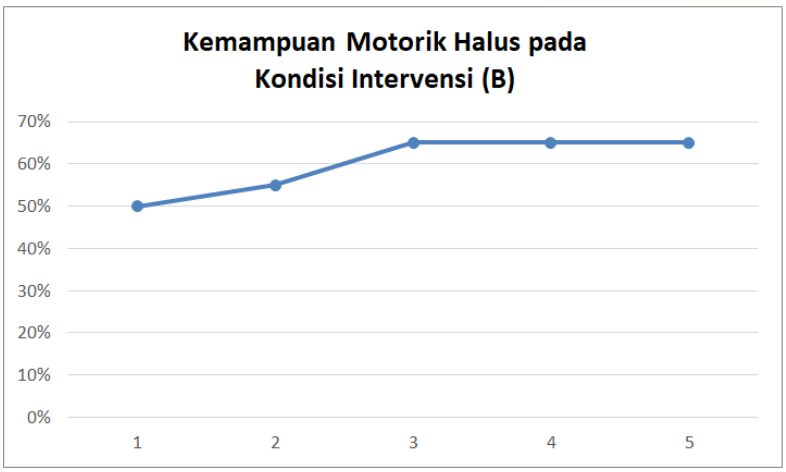


Graph 1 Fine motor skills in Baseline condition (A_1)

In the **Intervention phase (B), after being given** *loose-parts* -based collage activities , children's fine motor skills began to improve. They began to be able to tear, stick, and cut better than before, although some activities still required guidance. This increase can be seen from the percentage of ability which reached **65% .**

Table of Capability after intervention (B)

The th meeting	Day/Date	Percentage
4	Thursday/January 8, 2026	50%
5	Friday/January 9, 2026	55%
6	Monday/January 12, 2026	65%
7	Tuesday/January 13, 2026	65%
8	Wednesday/January 14, 2026	65%

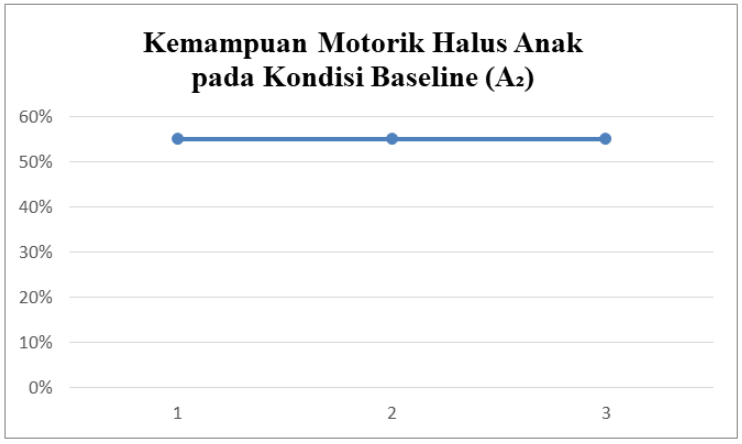


Graph 2 Fine Motor Skills in Intervention Conditions (B

Phase Second baseline (A_2) After the intervention was stopped, the children's abilities still showed better results compared to the initial conditions with a percentage of 55% , although there was a slight decrease compared to the intervention phase. Overall, the results of the analysis showed that *loose part -based collage activities* had a positive influence on improving the fine motor skills of children with intellectual disabilities, especially in manipulative skills such as tearing, squeezing, sticking, and eye-hand coordination.

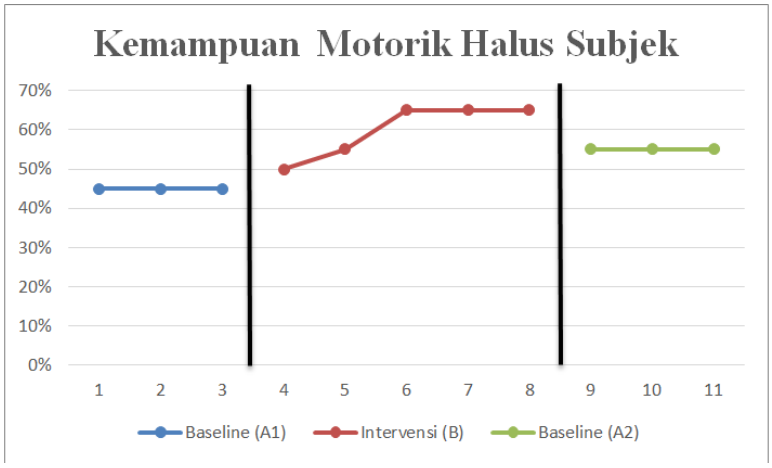
Table 4.3 Ability after intervention (A_2)

The th meeting	Day/Date	Percentage
10	Monday / January 19, 2026	55%
11	Tuesday / January 20, 2026	55%
12	Wednesday / January 21, 2026	55%



Graph 3 Fine Motor Skills at Baseline Condition (A_2)

Based on the data obtained for each condition, it can be described in the graph below:



a. overlapping data

The method used to determine data overlap in conditions A_1 and B is as follows:

1) Determine the upper and lower limits at baseline condition A_1, the lower limit is 0 and the upper limit is 0.

2) Determine how many data points are obtained in the intervention condition (B) within the range of baseline conditions (A_1).

3) Then the number of points obtained is divided by the number of data points in the intervention condition (B) and then multiplied by 100%.

Baseline conditions (A_1) with intervention (B), determine data overlap:

1) Condition A_1 has a lower limit of 0 and an upper limit of 0

2) Furthermore, the number obtained by the data points during condition B with the range of condition A_1 is: 0

3) Overlap = $\frac{0}{5}$ x 100% = 0%

The method used to find overlapping data in conditions A_2 and B is as follows:

1) Determine the upper and lower limits in condition A_2, the lower limit is 50.88% and the upper limit is 59.12%

2) Determine how many data points are obtained in condition B within the range of condition A_2

3) Then the number of points obtained is divided by the number of data points in condition B and then multiplied by 100%.

Condition A_2 with B, determines the data overlap:

1) Condition A_2 has a lower limit of 50.88% and an upper limit of 59.12%

2) Furthermore, the number obtained by the data points during condition B with the range of condition A_2 is: 2

Overlap = $\frac{1}{5}$ x 100% = 20%

Based on the analysis of the overlap percentage, the percentage obtained for the baseline (A_1) and intervention conditions was 0%. Then, when the intervention and baseline (A_2) conditions were 20%. In this case, it is stated that if the percentage of overlap obtained is smaller, then the intervention given has a good influence on the target behavior.

4. DISCUSSION

Based on the results of the study of tearing ability in phase A1 the child gets a score of 2 because in this phase the child has difficulty tearing. The tearing process must use 2 hands but the child's left hand is stiff so the child has difficulty tearing the paper this is in accordance with the 2021 child development achievement level standards that tearing activities must involve 2 hands. In the squeezing indicator, the child gets a score of 1 because in this phase the child has difficulty squeezing using all fingers and the child is not yet able to squeeze, and the child only uses 4 fingers (index, middle, ring, and little finger) according to **Santrock (2007) ,** fine motor skills involve the coordination of small muscles of the hands and fingers including the use of the thumb as the main support in manipulative movements such as squeezing.

Meanwhile, the child's cutting indicator received a score of 1 because the child had difficulty holding the scissors and adjusting the scissors hole to his fingers. When a child wants to cut paper randomly, the child has difficulty moving the scissors blade to the paper, the child still needs a long time and the child's hand is almost hit by the scissors blade. **Hamid (2020) said** that cutting is an advanced fine motor skill that requires finger coordination, grip strength, wrist stability, and eye-hand coordination simultaneously.

In the indicator of using glue in phase A1, the child gets a score of 3 because at this stage the child is already using glue directly, however, at the stage of using glue the child is still putting glue onto the picture randomly. Even when there is still a lot of glue left on the child's fingers, they don't put the glue on the paper. This is in line with **Latash (2012) ,** the skill of manipulating small objects and tools is part of fine motor skills which involve finger pressure

control, movement regulation, and visual feedback. Children who do not yet have good finger pressure control tend to make undirected movements when using tools such as glue.

In the eye-hand coordination indicator in phase A1, the child gets a score of 2 because when the child is doing the activity of tearing or even squeezing, the child does not look at the object or image and this opinion is supported by **Ayres and Robbins (2005)** who explain that visual-motor coordination (*visual motor integration*) occurs when information received through sight is used to guide hand movements accurately. If visual attention is not focused on the object, then the fine motor response becomes less effective. The researcher has not provided assistance for A1.

In the tearing ability phase B, the child obtained a score of 3 because in this phase, treatment was given to repeat the tearing indicator. Although each meeting the child used different materials, the researcher still provided instructions for tearing. During the tearing phase in the intervention phase, the researcher provided treatment to use both hands. Although the child's hands were stiff, the researcher gave instructions to hold the paper using the index finger and thumb.

The squeezing indicator in phase (B) for the first meeting, the child still had difficulty at this stage and the child got a score of 1. When squeezing, the child still had difficulty moving his fingers. After being given the treatment for the second time, the child started to get used to squeezing the paper even though the child's left hand was still stiff. But researchers still provide intervention to the hand to move the finger muscles. At the intervention stage of the squeezing activity, the child even only holds the paper instead of squeezing using all of his fingers. In the third session of the intervention phase, the child began to improve at squeezing. After being instructed and given examples of how to squeeze, the child began using his thumb to move, and sometimes even using both hands to practice the fine motor skills of his left hand.

In the scissoring indicator for phase (B), the child only received a score of 1 because the child was still learning how to put his finger into the hole and how to move the scissors properly. Therefore, the child at this stage has not yet made any progress because it takes a long time to move his finger. Meanwhile, the indicator using glue in phase (B) the child received a score of 3 because the child was still not neat in placing the glue on the media, but the child already understood how to pick up the glue using his fingers, although it was still not neat.

The eye-hand coordination indicator in phase (B) improved in the third session. During the first and second sessions, the child always stuck to the object without looking at the object . Subsequently , when squeezing or even cutting, the child still didn't look at the object. Then, at the third meeting, the child experienced an increase in score of 2 because when the child was sticking, he was always told to look in the direction of the goal.

Phase (A2) for the child's tearing indicator is still stable at a score of 2 even though it has been paused for several days , but the child still maintains that score because the child can tear in different directions and use both hands and fingers to tear the paper. Meanwhile, the

squeezing indicator in phase (A2) the child still does squeezing activities such as holding rather than using all fingers like squeezing in general.

In the cutting indicator stage, the child still scored 1 because he was still practicing how to position his hands properly and how to move the scissors. In the eye-hand coordination indicator, after a pause and no further treatment, the child received a score of 2 because he was still not looking at the materials and media enough and only looked at the media provided after being reminded.

In the intervention phase (B), there was a significant increase in fine motor skills compared to the baseline phase (A_1). After the children were given treatment in the form of *loose part*-based collage activities , the fine motor skills scores showed an increasing and more stable trend. Children began to be able to tear and crumple materials, cut although not yet fully able, and stick collage materials with minimal guidance in this phase the children scored 55%. This is also supported by the statement of Nugrahaeni & Ami (2023) that *loose parts media collage activities* can help children improve their fine motor skills in carrying out various children's activities and can relax children's hand muscles. Therefore, by using loose parts media collage activities, it is hoped that it can arouse curiosity, arouse children's interest in learning, motivate children to learn, and make it easier for children to use small muscles with eye-hand coordination.

Phase A2 is the phase after the intervention is given and the child performs activities without being given treatment again after a 3-day break. In this phase, the child begins to receive sufficient scores when squeezing activities because the child is still lacking in squeezing , but the child can hold the paper. When cutting, the child is not yet able to even insert the scissors close to the paper. The child's score at this stage is 55%.

The comparison of A1 to the final phase B was 20% and the score increased because the child had been given treatment and had been told how to squeeze, cut, coordinate eyes and hands and others. Meanwhile, the comparison of A1 to A2 was 10% because the child had not been given treatment again at the time of A2, the child was still holding the paper instead of squeezing using all fingers. The scores obtained indicate that most of the skills that had been trained during the intervention phase were still maintained, although there were slight fluctuations.

Furthermore, the use of *loose materials* like leaves, seeds, and other natural materials makes children more interested and motivated to participate in activities. Children appear more enthusiastic, less bored, and demonstrate a keen curiosity about the materials used. From a behaviorist perspective, improvements in fine motor skills during the intervention phase occur due to repeated and consistent practice. Children are trained to perform the same activity over several sessions with gradually increasing levels of difficulty. This repetition strengthens the child's motor responses, resulting in more refined and focused skills.

This research is consistent with various previous studies which state that collage activities can improve the subject's fine motor skills. Research by Moniru (2021) and Anindayanti

(2022) shows that collage activities can improve hand-eye coordination, finger strength, and writing readiness in children with mild intellectual disabilities. This effectiveness is due to the child's direct involvement in manipulative activities that require intensive use of small muscles.

Maharani's (2024) research also demonstrated that collages using natural materials like seeds can improve fine motor skills in young children . Small materials require children to use precise finger movements, thus developing hand muscles. The same was true in this study, but with a wider variety of materials through *a loose-part approach* , providing richer stimulation.

Collage activities in improving fine motor skills, both in previous research and this research, are caused by several main factors. First, collage activities involve complex but meaningful manipulative movements, such as pinching, cutting, and sticking, which directly train the small muscles of the hands.

5. CONCLUSION

Based on the research results, it can be concluded that the fine motor skills of mentally retarded children before being given intervention were still low and tended to be stable , so that children experienced difficulties in writing activities. After being given intervention through collage activities , children's fine motor skills improved. This shows that loose part - based collage activities can... improve fine motor skills of mentally retarded children .

Loose-part collage activities can be used as an alternative, applicable learning strategy to stimulate and improve the fine motor skills of children with intellectual disabilities. The use of diverse, easily manipulated materials that are close to the child's environment has been shown to encourage active engagement and provide meaningful motor experiences. Therefore, teachers and therapists are advised to integrate loose-part collage activities routinely and gradually into learning programs and skills training, while still paying attention to the safety aspects of tool use and the child's individual needs to optimize stimulation results.

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