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The Effect of Natural Collages on Fine Motor Skills in Children in Group B at Pembina Melati Tondo Public Kindergarten

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A B S T R A C T

This study aims to determine the effect of natural material collage activities on the fine motor skills of children in group B at Pembina Melati Tondo State Kindergarten. The background of this study stems from the importance of early childhood education in optimizing all aspects of development, including fine motor skills. Collage activities using natural materials were chosen as a learning medium because they are believed to stimulate eye-hand coordination, finger strength, flexibility, and accuracy through activities such as sticking, arranging, and manipulating natural materials. This study used a quantitative approach with a quasi-experimental design of the one-group pretest-posttest type. There were 14 children in the study. Data were collected through observation, interviews, and documentation, then analyzed using descriptive analysis and the Wilcoxon Signed Rank Test non-parametric test. The results of the study showed an increase in fine motor skills after conducting natural material collage activities. The average score for children's abilities increased from 2.10 in the pretest to 3.14 in the posttest. The increase occurred in all aspects, namely strength, finger flexibility, and accuracy. The Wilcoxon test results showed a significance value of 0.005 (< 0.05), indicating a significant difference between the children's abilities before and after the treatment. Thus, collage activities using natural materials have been proven to have a significant and effective influence on improving the fine motor skills of early childhood.

1. Introduction

Education is a conscious and planned effort to create a pleasant learning environment so that students can actively develop their potential. The objectives of education include the formation of religious spiritual strength, self-control, personality, intelligence, noble character, and skills that are beneficial to individuals

and society. In addition to teaching specific skills, education also includes profound matters such as the cultivation of knowledge, the development of judgment, and the formation of wisdom (Annisa, 2022). Education shapes people into individuals who are useful to the state, nation, and homeland (Alpian, 2019). Through learning experiences, a person can transform and develop to become more mature, intelligent, and adult. In other words, education is a system that serves to facilitate change towards maturity, increased intelligence, and self-development (Mukodi, 2018). Thus, education is not only a means of preparation for the future, but also plays an important role in the lives of children who are currently developing towards maturity (Rahman, 2022).

Early childhood education fundamentally involves various efforts and actions from educators and parents in caring for, nurturing, and educating children. This learning process occurs through observation, imitation, and experimentation that are carried out repeatedly, involving all of the child's potential and intelligence (Ma'sum, 2018). As stated by Mulyasa in (Saputri, 2019), early childhood is a period of rapid growth and development, which can even be considered a leap in development. Meanwhile, Roostin (2021) explains that early childhood education is an important foundation for the education of the nation's future generations. The specific objectives of early childhood education according to Fadlillah, in (Yenti, 2021) are: 1) The creation of optimal early childhood growth and development through improved preschool services; 2) The creation of improved knowledge, skills, and attitudes of parents in their efforts to foster optimal child growth and development; 3) Preparing early childhood children who will be ready to enter primary education.

Collage is an application creation made by combining drawing techniques (hand drawing) with pasting certain materials. According to Salam, collage is a type of artwork made by pasting pieces of glass or material (e.g., paper, glass, tiles, shells, leaves) that are used as part of a described form. (Ramadhani, 2021). In addition, natural materials such as leaves and seeds have diverse shapes and textures, which can develop children's naturalistic intelligence and teach them to love and appreciate nature more, according to Aslindah and Suryani, in (Palmin, 2023). Natural materials are very suitable for use in early childhood learning activities at the concrete thinking stage, because natural materials are more tangible, easily obtained, and found in the surrounding environment, according to Rahmawati in (Issa, 2019).

According to (Anggraeni, 2021), collage activities have a number of benefits for early childhood. Among these benefits, collage can stimulate children's motor skills, spark creativity, and improve focus and concentration. Pratiwi in (Yuliawati, 2023) states that children have a sense of curiosity from collage activities because these activities use different materials according to the needs of the user. Children will then try to solve problems when they are able to stick the collage materials according to the pattern. Children will feel challenged in completing their collages and be able to appreciate the results of their work, showing that collage activities greatly enhance a child's creativity. According to Claudia in (Sholikah, 2023), through collage techniques, children will develop precision in their prior knowledge, accuracy in attaching materials, and train their hand development.

On the other hand, fine motor skills, such as folding, cutting, and drawing, involve the use of small muscles and require a high level of concentration between the eyes and hands (Ariani, 2022). Sujiano and Bambang in (Insana, 2022). One very important aspect of child development is fine motor skills. Thus, the development of fine motor skills is highly dependent on good coordination between the eyes and fingers. As children age, the development of fine motor skills occurs gradually and continuously. Children's movements will transition from simple, unorganized, and unskilled to more complex and well-structured skills. Through exploratory activities, children can learn to manipulate various objects, which in turn will strengthen their fine motor skills (Primayana, 2020). Sujiono in (Rahmatari, 2022) also states that fine motor movements are movements that only involve certain parts of the body and are performed by small muscles, such as the fingers with precise wrist movements.

The factors that influence children's fine motor development are diverse. According to Rahyubi in (Lubis, 2025), these factors include nervous system development, physical condition, motivation, and environment. Activities such as cutting, pasting, maronce, and collage are some examples that can be used to support this development (Hodge, 2018). Meanwhile, Aulina in (Boray, 2024) mentions factors such as heredity or inheritance from birth, environmental factors that are beneficial or detrimental to the development of organic and psychological functions, and finally, children's emotional intelligence, which influences their willingness to develop themselves.

The objectives of this study are to determine the fine motor skills of children in Group B of the Pembina Melati Tondo State Kindergarten before the implementation of nature-based collage activities, to describe the implementation of nature-based collage activities in Group B of the Pembina Melati Tondo State Kindergarten, and to determine whether or not nature-based collage activities have an effect on the fine motor skills of children in Group B of the Pembina Melati Tondo State Kindergarten.

2. Methodology

This study uses a quantitative approach. A quantitative approach was chosen because it is in line with the inferential research objectives that focus on testing hypotheses. Quantitative research emphasizes analysis of numerical data, which is then processed using statistical techniques. The type of research used is a quasi-experiment. According to Cook in Abraham & Supriyati (2022), a quasi-experiment is experimental research that has treatment, impact measurement, and experimental units, but does not use random assignment. In this study, the researchers observed the children's conditions, especially regarding their use of natural collage media and their fine motor skills.

The research design used refers to Sugiyono's formula in Saphira et al. (2022), namely a one-group pretest-posttest design. This design was adapted to the research subjects, namely early childhood education children. This design was chosen to see

whether there was an effect of the use of collage media on children's fine motor skills. The design is illustrated in Figure 1.

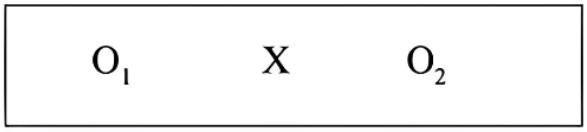

Figure 1. Research Design

Information:
O1 : *Pretest*
X : Treatment
O2 : *Posttest*

The study was conducted in group B of Pembina Melati Tondo State Kindergarten, North Palu District, Palu City, located at Jalan Uwe Goda No. 01, Tondo Village, Mantikulore District. This school has four classes, namely B1, B2, B3, and B4. The researcher chose group B4 because several problems related to children's fine motor development were found. Initial observations were made to see the children's condition in relation to collage activities and their fine motor skills. The research subjects were 14 children from group B of the Melati Tondo State Kindergarten, consisting of 8 boys and 6 girls.

The data used is qualitative data obtained from observations of children during the learning process. This data describes the children's fine motor skills before and after treatment. The data sources are primary and secondary data. Data collection techniques include observation, documentation, and interviews. Data analysis consists of two types, namely descriptive analysis and inferential analysis. The percentage is calculated using the following formula:

$$P = \frac{f}{N} \times 100\%$$

Information:
P = Percentage
F = Frequency
N = Number of samples

The analysis produced the mean, standard deviation, variance, minimum and maximum values, which were then presented in a table. Inferential analysis was used to test the hypothesis regarding the effect of natural material collage activities on children's fine motor skills. Because the normality test results showed that the data were not normally distributed, the non-parametric Wilcoxon Signed Rank Test was used. This test is suitable for paired data (pretest–posttest) and was used through the SPSS version 26 program. If Asymp. Sig. (2-tailed) < 0.05 → there is a significant difference → Ha is accepted, H_0 is rejected. If Asymp. Sig. (2-tailed) > 0.05 → there is no significant difference → H_0 is accepted. The results of this test will show whether the natural material collage method really affects the fine motor skills of children in group B at the Pembina Melati Tondo State Kindergarten.

3. Result and Discussion

The first step in this study was to conduct preliminary observations at the Pembina Melati Tondo State Kindergarten in group B4. The researcher then interviewed the B4 class teacher. The study was conducted from September 1 to September 26 with 14 children as research subjects. The aspects observed included strength, finger flexibility, and accuracy. The researcher presented the results before and after the treatment to determine the effect of natural collage on children's fine motor skills. The distribution of children's fine motor skills before the treatment showed that most children were in the Beginning to Develop (MB) and Not Yet Developed (BB) categories. Table 1 presents the complete results in terms of strength, finger flexibility, and accuracy.

Table 1. Recapitulation of Observation Results Before Treatment

Category	Fine Motor Skills						Average (%)
	Strength		Flexibility of the fingers		Accuracy		
	F	%	F	%	F	%	
Developing Very Well (BSB)	1	7,14%	2	14,28%	1	7,14%	9,52%
Developing as Expected (BSH)	3	21,42%	1	7,14%	2	14,28%	14,28%
Starting to Develop (MB)	6	42,86%	4	28,58%	5	35,72%	35,72%
Not Yet Developing (BB)	4	28,58%	7	50%	6	42,86%	40,48%
Total	14	100	14	100%	14	100%	100%

Based on Table 1, it can be seen that of the 14 children who were the subjects of the study. In all aspects, it was observed that the average score before treatment was 9.52% of children in the Very Good Development (VGD) category, 14.28% in the Expected Development (ED) category, 35.72% in the Beginning Development (BD) category, and 40.48% in the Not Yet Developing (NYD) category. The average ability of children in the three aspects was still low: 9.52% in the BSB category, 14.28% in the BSH category, 35.72% in the MB category, and 40.48% in the BB category. After being given treatment with natural material collage activities, there was an increase in children's fine motor skills. In terms of strength, there was an increase from the MB and BB categories to BSB and BSH. In terms of finger flexibility, children in the BSH category increased to 57.14%. In terms of accuracy, children in the BSB and BSH categories also increased..

From the results of interviews with teachers at Pembina Melati Tondo State Kindergarten with the question, “Are there any obstacles you encounter when implementing collage activities to develop children's fine motor skills?” "There are several obstacles encountered, for example: Children are impatient and rush, so the results are not neat. Some children had difficulty using glue, either using too much or too little. The children were also unable to stick the pieces accurately according to the pattern as their motor skills were not yet developed, causing them to often

stray from the pattern when sticking." The following image shows the activity in Figure 2.

Figure 2. Collage Activity to Develop Children's Fine Motor Skills

Children were given instructions and immediately practiced collage techniques to develop their fine motor skills. Table 2 presents the complete results in terms of strength, finger flexibility, and accuracy.

Table 2. Recapitulation of Children's Observations After Treatment

Category	Fine Motor Skills						Average (%)
	Strength		Flexibility of the fingers		Accuracy		
	F	%	F	%	F	%	
Developing Very Well (BSB)	5	35,72%	4	28,58%	4	28,58%	30,96%
Developing as Expected (BSH)	6	42,86%	8	57,14%	6	42,86%	47,62%
Starting to Develop (MB)	2	14,28%	1	7,14%	2	14,28%	11,9%
Not Yet Developing (BB)	1	7,14%	1	7,14%	2	14,28%	9,52%
Total	14	100	14	100%	14	100%	**100%**

Based on Table 2, it can be seen that of the 14 children who were the subjects of the study, in all aspects, it was observed that the average score after treatment was 30.96% in the (BSB) category, 47.62% in the (BSH) category, 11.9% in the (MB) category, and 9.52% in the (BB) category. The average ability of the children after treatment was: 30.96% BSB, 47.62% BSH, 11.9% MB, and 9.52% BB. This shows positive development after treatment. When displayed in a histogram, it can be seen as follows:

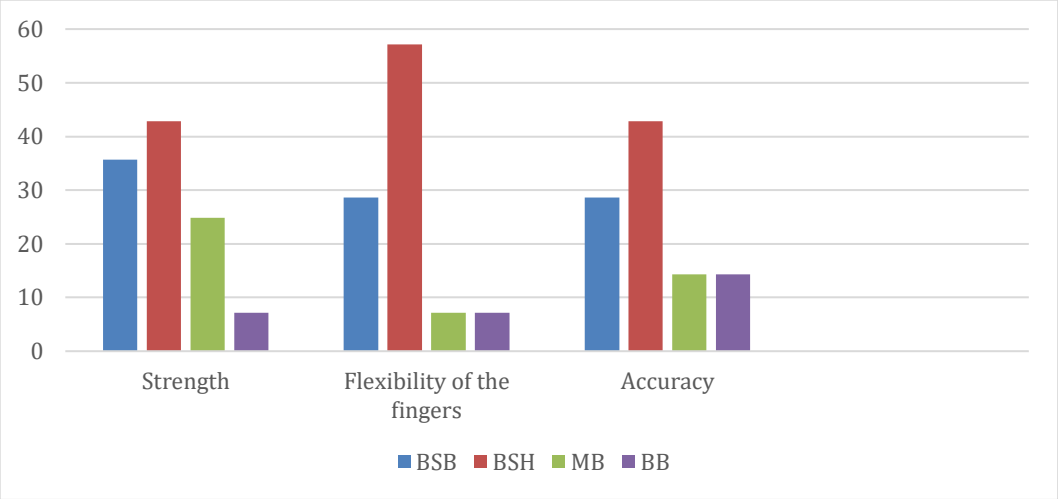

Figure 3. Histogram of Observation Results After Treatment

According to the histogram in Figure 3, it is known that 14 children were the subjects of the study, from all aspects observed, starting from the strength aspect, the flexibility aspect of the fingers, and accuracy. The Very Good Development (VGD) category is marked with a blue diagram, the As Expected Development (AED) category is marked with a red diagram, the Starting to Develop (SSD) category is marked with a green diagram, and the Not Yet Developed (NYD) category is marked with a purple diagram. The following is a summary of observations before and after treatment in Table 3.

Table 3. Summary of Observations Before and After Treatment

Category	Pre-observation (O1)						Post-observation (O2)					
	Strength		Flexibility of the fingers		Accuracy		Strength		Flexibility of the fingers		Accuracy	
	F	%	F	%	F	%	F	%	F	%	F	%
Developing Very Well (BSB)	1	7,14%	2	14,28 %	1	7,14%	5	35,72 %	4	28,58 %	4	28,58 %
Developing as Expected (BSH)	3	21,42 %	1	7,14%	2	14,28 %	6	42,86 %	8	57,14 %	6	42,86 %
Starting to Develop (MB)	6	42,86 %	4	28,58 %	5	35,72 %	2	14,28 %	1	7,14%	2	14,28 %
Not Yet Developing (BB)	4	28,58 %	7	50%	6	42,86 %	1	7,14%	1	7,14%	2	14,28 %

Table 3 shows that there is a significant effect on children's fine motor skills before and after the treatment of doing collage activities using natural materials. Observations made before and after the treatment show that there has been a positive change in children's fine motor development.

Descriptive Statistical Analysis

Table 4 clearly shows the conditions before and after the treatment on the children's fine motor skills.

Table 4. Descriptive Statistics

	N	Range	Min	Max	Mean		Std. Devation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Before treatment	14	3	1,00	4,00	2,10	0,16	0,61	0,37
After treatment	14	2	2,00	4,00	3,14	0,11	0,14	0,17

According to Table 4, it can be explained that the mean value before treatment was 2.10 with a standard deviation of 0.61 and a variance of 0.37. This shows that the children's fine motor skills before being given the collage treatment were still in a varied category, with a fairly large spread of values. The minimum value before treatment was 1.00 and the maximum value was 4.00, with a range of 3. After treatment through natural material collage activities, the average value of children's fine motor skills increased to 3.14 with a standard deviation of 0.14 and a variance of 0.17. This data shows that after treatment, children's fine motor skills not only improved but also became more evenly distributed among children because the spread of values was smaller than before treatment. The minimum value after treatment was 2.00 and the maximum value remained 4.00, with a range of 2. Overall, these descriptive statistical results show that natural material collage activities can have a positive impact on improving children's fine motor skills. The descriptive statistics show that before the treatment, the average score for children's fine motor skills was 2.10 with a standard deviation of 0.61. After the treatment, the average score increased to 3.14 with a standard deviation of 0.14. This indicates an improvement in ability as well as a more even distribution of skills.

Inferential Analysis

Based on the ordinal nature of the observational data and the relatively small number of research subjects (10), the Wilcoxon signed-rank test was used to determine the difference in results before and after treatment. This test was used because it does not require normally distributed data and is more suitable for ordinal scale data, as shown in Table 5.

Tabel 5. Test Statistics

	Test Statistics[a]
	Y – X (After – before)
Z	-2.805
Asymp. Sig. (2-tailed)	0.005

The Wilcoxon Signed-Rank test results showed a z value of -2.805 with a significance value of 0.005 < 0.05, indicating a significant difference between

before and after treatment. Natural material collage activities had a significant effect on children's fine motor skills.

Discussion

This study was conducted to determine the effect of natural material collage activities on children's fine motor skills. The results showed an improvement in all aspects of fine motor skills, namely strength, finger flexibility, and accuracy. This improvement is in line with Sujiono's theory and the opinions of several researchers, such as Qalbu et al. (2023), who stated that collage can improve hand skills through activities such as sticking, arranging, and tearing natural materials. In addition to improving fine motor skills, collage also provides meaningful sensorimotor experiences for children. Overall, the results of the study indicate that natural material collage is an effective learning method for improving the fine motor skills of early childhood.

The Effect of Natural Collage on Children's Fine Motor Skills, which involves small muscles and hand-eye coordination. Natural collage helps children develop flexibility, strength, and precision of movement through activities such as sticking, arranging, and cutting. In terms of strength, observations showed a significant increase in finger strength after treatment. Children became stronger in grasping and controlling small objects. In terms of finger flexibility, collage helped children develop flexibility through tearing, cutting, and pasting activities. The number of children in the BSB and BSH categories increased significantly after the treatment. Precision also showed improvement. Children became more skilled at placing materials according to patterns and worked more neatly. Collages directly train hand-eye coordination. Thus, natural material collage activities have been proven to have a significant effect on children's fine motor development.

4. Conclusion

Based on the results of research on the effect of natural material collage activities on children's fine motor skills, it can be concluded that the application of natural material collage activities can provide meaningful learning experiences for children. This activity is carried out through the introduction of various natural materials, providing examples of collages, and assisting children when they select and stick leaves onto the provided patterns. This gradual and repetitive process runs smoothly and helps children develop hand-eye coordination, finger flexibility, and neatness in sticking.

The results of the study show an increase in children's fine motor skills after being given the treatment. The average score for children's abilities increased from 2.30 in the pretest to 3.13 in the posttest. This improvement was evident in all indicators, where children who were previously in the Beginning to Develop (MB) category began to move to the Developing as Expected (BSH) category and even the Developing Very Well (BSB) category. This proves that natural material collage activities are effective in improving children's accuracy, coordination, and

manipulative abilities.These findings are reinforced by statistical test results using the Wilcoxon Signed Rank Test, which shows an Asymp. Sig. (2-tailed) value of 0.005, which is less than 0.05. Thus, it can be confirmed that there is a significant effect between natural material collage activities and the improvement of children's fine motor skills. Overall, natural material collage activities have been proven to have a positive and effective impact on developing the fine motor skills of children in group B at the Pembina Melati Tondo State Kindergarten.

Referances

Anggraeni, S. N., Mulyana, E. H., & Giyartini, R. (2021). Pengembangan Bahan Ajar Kolase Untuk Memfasilitasi Pembelajaran Seni Rupa Anak Usia Dini. *Jurnal Paud Agapedia*, *5*(1), 10–21. https://doi.org/10.17509/jpa.v5i1.39659

Annisa, D. (2022). Jurnal Pendidikan dan Konseling. *Jurnal Pendidikan Dan Konseling*, *4*(1980), 1349–1358.

Alpian, Y., Anggraeni, S. W., Wiharti, U., & Soleha, N. M. (2019). Pentingnya pendidikan bagi manusia. *Jurnal buana pengabdian*, *1*(1), 66-72.

Ariani, I., Lubis, R. N., Sari, S. H., Fransisca, Y., & Nasution, F. (2022). Perkembangan Motorik Pada Anak Usia Dini Indri. *Jurnal Pendidikan Dan Konseling*, *4*, 1349–1358. https://journal.universitaspahlawan.ac.id/index.php/jpdk/article/view/10444/8008

Boray, F. A. (2024). Pengaruh Kegiatan Melipat Kertas dan Teknik Kolase untuk Perkembangan Motorik Halus Anak Usia Dini. *JIIP - Jurnal Ilmiah Ilmu Pendidikan*, *7*(6), 5241–5246. https://doi.org/10.54371/jiip.v7i6.4557

Hodge, G. (2018). *Privatization: An international review of performance*. Routledge.

Insana, S. N., Ismail, W., & Agusriani, A. (2022). *Pengaruh Kegiatan Kolase Terhadap Perkembangan Motorik Halus Anak Usia 5-6 Tahun*. *4*, 122–132. https://doi.org/10.37411/jecej.v4i2.1240

Issa, J. (2019). No TitleΕΛΕΝΗ. *Αγαη*, *8*(5), 55.

Lubis, N. H., Wahyuni, A., & Daulay, A. M. (2025). Analisis Kemampuan Motorik Halus Anak Melalui Kegiatan Kolase di RA Darussalam Kota Siantar. *Khirani: Jurnal Pendidikan Anak Usia Dini*, *3*(1), 95-108.

Ma'sum, T. (2018). Konsep Pendidikan Anak Usia Dini Toha Ma'sum. *Al Intizam*, *1*(2), 38-68.

Mukodi. (2018). Tela ' Ah Filosofis Arti Pendidikan Dan Faktor-Faktor Pendidikan Dalam Ilmu Pendidikan. *Jurnal Penelitian Pendidikan*, *10*(2), h 1468-1476.

Palmin, B., & Woda, M. I. (2023). *Manfaat Media Bahan Alam Dalam Pembelajaran Anak Usia Dini Benefits of Natural Material Media In Early Childhood Learning 1 | Jurnal Lonto Leok : Vol 5 , No 1 Februari 2023 2 | Jurnal Lonto Leok : Vol 5 , No 1 Februari 2023*. *5*(1), 1–7.

Primayana, K. H. (2020). Meningkatkan keterampilan motorik halus berbantuan media kolase pada anak usia dini. *Purwadita*, *4*(1), 91-100.

Rahmatari, S. (2022). Penggunaan media bahan alam pada kegiatan kolase dalam meningkatkan motorik halus anak kelas b TK Cempaka Kombo Kecamatan Wawo Kabupaten Bima. *Http://Etheses.Uinmataram.Ac.Id*, *9*, 1–96.

Ramadhani, F. (2021). Penerapan Metode Demonstrasi Melalui Pembelajaran Kolase Terhadap Kreativitas Peserta Didik Pada Mata Pelajaran SBdP. *Journal of Business Theory and Practice*, *10*(2), 6.

Rahman, A., Munandar, S. A., Fitriani, A., Karlina, Y., & Yumriani. (2022). Pengertian Pendidikan, Ilmu Pendidikan dan Unsur-Unsur Pendidikan. *Al Urwatul Wutsqa: Kajian Pendidikan Islam*, *2*(1), 1–8.

Roostin, E., Aprilianti, R., & Martini, A. (2022). Pelatihan media permainan tradisional dakuca terhadap guru Raudathul Athfal Kabupaten Sumedang. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *6*(5), 5154-5164.

Saputri, I. A., & Afifah, D. R. (2019). Gaya Belajar Anak Usia Dini Kelompok B Tk Margobhakti Kota Madiun. *Jurnal CARE (Children Advisory Researsh and Education)*, *6*(2), 30–34.

Sholikah, A. (2023). *Peningkatan Kemampuan Motorik Halus Menyusun Kolase dengan Media Biji-Bijian Melalui Kegiatan*. *2*(1), 58–73.

Yenti, Y. (2021). Pentingnya Peran Pendidik dalam Menstimulasi Perkembangan Karakter Anak di PAUD. *Jurnal Pendidikan Tambusai*, *5*(2), 2045–2051.

Yuliawati, A., Zulianti, P., & Puspitasari, E. (2023). Analisis Kemampuan Motorik Halus dan Kreativitas pada Anak Usia Dini Melalui Kegiatan Kolase. *Edu Happiness: Jurnal Ilmiah Perkembangan Anak Usia Dini*, *2*(1), 89–101. https://doi.org/10.62515/eduhappiness.v2i1.162

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