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An Ethnopedagogy of banana fronds media based on kampar Riau's Culture for children's fine motor skills

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Abstract

This study examines the effect of banana frond media on the fine motor skills of children aged 4–5 years at Cempaka Aisyiyah 004 Kindergarten through pattern-filling activities. A quantitative pre-experimental method with a one-group pretest–posttest design was used. The sample consisted of 15 children selected through purposive sampling. Data were collected through observation and documentation, then analyzed using a normality test and a paired-sample difference test. The children's average fine motor ability rose gradually across six treatment sessions, from 37.5% (not yet developing) in the pretest to 97.1% (developing very well) in the posttest. The t-count of −17.040 exceeded the t-table value of 2.160, with a significance level of 0.000 (< 0.05). Banana frond media therefore has a significant effect on young children's fine motor skills and can be recommended as a low-cost, local wisdom-based learning medium for early childhood educators.

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INTRODUCTION

Early Childhood Education has a crucial role in ensuring that all aspects of child development, including physical and motor maturity, are expected to be achieved optimally as a provision for advanced learning (Rudiyanto, 2016). One of the vital aspects that is often a challenge is fine motor development, which involves the coordination of small muscles and fingers as a basic foundation before the child enters the writing stage (Khadijah & Amelia, 2020). Phenomena in the field show that many children still experience obstacles in precision activities such as cutting, folding, and sticking due to the lack of proper motor stimuli (Dewi & Surani, 2018). A similar condition was observed at Cempaka Aisyiyah 004 Kindergarten, where group A children (aged 4-5 years) showed low interest and significant difficulties in finger coordination, reinforced by child growth and development data in Kampar Regency which noted the need for more intensive stimulation in the motor aspect due to the lack of interesting learning media variety (Dewi & Surani, 2018).

Theoretically, children aged 4-5 years are at the stage of fine motor development which is characterized by the ability to control finger movements in a more directed way, such as holding stationery, cutting along lines, and imitating simple shapes (Khadijah & Amelia, 2020). The small muscles in the hands of children of this age are not fully mature so they require repeated stimulation through concrete activities so that the coordination of the eyes and hands develops optimally (Khadijah & Amelia, 2020). A number of previous studies have examined the effectiveness of various hand skills-based activities for children's fine motor skills. Kirigami and origami activities, for example, have been shown to be effective in practicing finger-finger coordination through folding and scissors (Claudia et al., 2018; Rakimahwati et al., 2018). Weaving activities with natural materials also showed similar results (Meriyati et al., 2020; H. M. Sari & Nofriyanti, 2019). In addition, the use of natural materials in general as a medium of creativity also supports children's readiness to write at the beginning (Badroeni, 2017; Falera, 2024). Early fine motor skills are even linked to children's later literacy achievement (Suggate et al., 2019). However, these studies generally still focus on collage techniques and conventional natural materials such as grains and clay (N. Hasanah et al., 2019; Herlambang et al., 2023), while the specific use of local natural materials in printing techniques is still rarely explored.

This is where the scientific *novelty* of this research lies, namely the use of banana frond media in the activity of filling image patterns with printing techniques, which according to Sumanto's theory is an exploration medium to develop sensory competence and finger skills, not just art practice (Lestari, 2021). Banana fronds were chosen because of their unique texture, their abundant availability in rural areas such as Kampar Regency, and different tactile sensations compared to manufacturers' print media (Suriati et al., 2019; Wahyuni & Sugiharti, 2025).

The hypothesis proposed in this study is that there is a significant influence of the use of banana frond media on the improvement of children's fine motor skills. The purpose of this study is to prove the effectiveness of the use of local media in stimulating fine motor skills, as well as to make a practical contribution for early childhood educators in optimizing the potential of the surrounding nature as an efficient and educational learning medium (Badroeni, 2017). Based on this description, this article will specifically discuss the extent to which the use of banana frond media affects the improvement of fine motor skills in children aged 4-5 years, which is described through a comparison of children's achievements before and after treatment, progress in each treatment session, and the results of hypothesis testing statistically.

METHOD

This study uses a quantitative approach with a pre-experimental design type experimental method designed by one group with initial tests and final tests without comparison groups. This method was chosen to accurately test the effect of treatment in the form of the use of banana fronds on children's fine motor skills by comparing the conditions before and after the intervention in one group of subjects (Sugiyono, 2021). The research was carried out at Cempaka Aisyiyah 004 Kindergarten, Pulau Jambu Village, Kuok District, Kampar Regency, from October 2024 to May 2025, with the implementation of initial tests, six treatment meetings, and final tests carried out in May 2025 (May 13-29, 2025). The research procedure is carried out systematically

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through three main stages: preparation of treatment plan, implementation of treatment (intervention), and final evaluation through final test (Sukmadinata, 2017).

Participants in this study involved teachers and students aged 4-5 years at Cempaka Aisyiyah Kindergarten, Pulau Jambu, Kuok District, Kampar Regency. The sampling technique used is the purposeful sampling technique, which is the determination of samples based on certain considerations that are relevant to the research objectives (Sugiyono, 2021). The selected sample amounted to 15 children (9 boys and 6 girls). The reason for selecting this participant was based on preliminary observational findings that the 4-5 year old group showed the most significant indication of fine motor resistance compared to other groups, thus requiring immediate intervention using a variety of media.

Treatment was given as many as six meetings according to the Daily Learning Implementation Plan (RPPH) that had been prepared, with different themes and sub-themes at each meeting (e.g. animals, plants, and plant parts). At each meeting, children are asked to fill in the pattern of the picture that has been prepared by printing using pieces of banana fronds that have been dipped in dye, under the direct guidance of teachers and researchers. The six meetings were held consecutively on May 13, 15, 20, 22, 27, and 29, 2025.

Data collection techniques were carried out through systematic observation, performance tests, and documentation (Saat & Mania, 2020). The instrument used was a fine motor skills observation sheet with a developmental achievement scale assessment format, namely Not Developed (BB), Starting to Develop (MB), Developing According to Expectations (BSH), and Developing Very Well (BSB). Documentation in the form of photos of activities is used to strengthen empirical evidence of children's work. Furthermore, data were processed using statistical analysis techniques, which included instrument validity and reliability tests, normality tests, and average difference hypothesis tests to draw conclusions about the effectiveness of banana frond media in solving children's fine motor problems (Siregar, 2017; Sugiyono, 2019).

RESULTS AND DISCUSSION

Result

The initial test activity (*pretest*) is carried out to find out the child's fine motor skills before being given treatment. The results of the initial test showed an average of 37.5% of children's achievement in the not yet developing category. Based on the achievements of each indicator, the highest score was found in the indicator of the ability to move the fingers with an achievement of 40.0%, while the lowest score was found in the indicator of the ability to produce a form of work with an achievement of 33.3%. More detailed data on the distribution of children's abilities in the initial test are presented in Table 1 below, which shows that out of 15 children, none of the children were in the category of developing very well or developing as expected; 7 children (46.67%) were in the starting to develop category and 8 children (53.33%) were in the not yet developing category.

Table 1. Overview of fine motor skills of children aged 4–5 years at Cempaka Aisyiyah 004 Kindergarten before treatment (pretest)

No	Criteria	Score range	F	%
1	BSB	76%–100%	0	0%
2	BSH	56%–75%	0	0%
3	MB	41%–55%	7	46.67%
4	BB	< 40%	8	53.33%
	Total		**15**	**100%**

Note. BB = Not Developed; MB = Starting to Develop; BSH = Developing as Expected; BSB = Developing Very Well. Source: Research data on filling in image patterns with banana frond media (2025).

After the initial test was carried out, the child was given treatment in the form of filling in the pattern of the picture with banana frond media for six meetings. In general, children's abilities improve gradually and

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consistently at each meeting, characterized by increasingly controlled finger coordination, neater prints that do not deviate from the pattern line, and children's ability to produce creative and unique works. A summary of the average child achievement at each meeting is presented in Table 2 below.

Table 2. Development of children's fine motor skills at each treatment meeting

Meeting	Percentage	Category	Progress notes
Pretest	37.5%	BB	Children are not able to control their fingers well when printing
Treatment 1	44.6%	MB	The child begins to hold and press the banana frond on the pattern
Treatment 2	55.0%	MB	Finger movements are controlled, the print is neater
Treatment 3	64.2%	BSH	Children actively manage the position of their hands when printing
Treatment 4	76.3%	BSB	Children are able to produce creative and unique works
Treatment 5	86.3%	BSB	Eye and hand coordination is developing
Treatment 6	92.9%	BSB	Children are getting neat and careful in filling in picture patterns
Posttest	97.1%	BSB	Children's fine motor skills develop optimally

Note. BB = Not Developed; MB = Starting to Develop; BSH = Developing as Expected; BSB = Developing Very Well.
Source: Research data on filling in image patterns with banana frond media (2025).

These developments are also presented in the form of a graph in Figure 1 below, which shows the trend of increasing the average fine motor skills of children from the initial test stage to the final test (see Table 2).

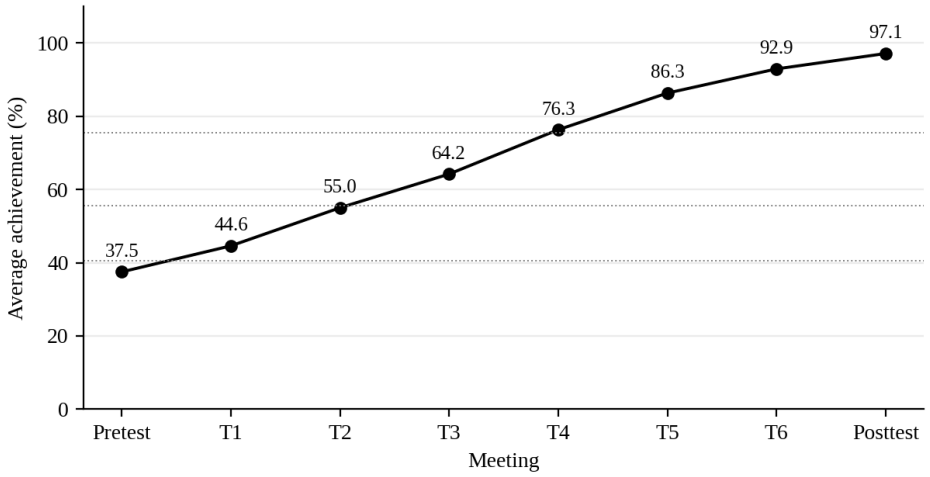


Figure 1. Average achievement of children's fine motor skills from pretest to posttest (T1–T6 = Treatment 1–6)

From the data, it can be seen that the activity of filling in image patterns with banana fronds is able to improve children's fine motor skills gradually and consistently at each meeting. Therefore, this activity is considered effective and fun to apply in learning to stimulate children's fine motor development. This study used a one-group design with an initial test and a final test because the researcher only examined one group, group A, and compared the initial test results with the final test results. The following is a comparison of the categories of children's abilities before and after treatment in the table below:

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Table 3. Recapitulation of fine motor skills of children aged 4–5 years at Cempaka Aisyiyah 004 Kindergarten before and after treatment

No	Criteria	Score range	Before		After	
			F	%	F	%
1	BSB	76%–100%	0	0%	15	100%
2	BSH	56%–75%	0	0%	0	0%
3	MB	41%–55%	7	46.67%	0	0%
4	BB	< 40%	8	53.33%	0	0%
Total			**15**	**100%**	**15**	**100%**

Note. BB = Not Developed; MB = Starting to Develop; BSH = Developing as Expected; BSB = Developing Very Well.
Source: Research data on filling in image patterns with banana frond media (2025).

A comparison between the initial test and the final test showed that all samples that had been treated had improved. In the initial test, 7 children (46.67%) were in the criteria of starting to develop and 8 children (53.33%) were in the criteria of not developing. After being treated through the activity of filling in the drawing pattern with banana fronds, all 15 children (100%) managed to achieve the criteria of developing very well, with an average fine motor ability score of 97.1%. The 100% figure in the table above shows the proportion of children who reach the highest category, while the figure 97.1% shows the average achievement score of all children, so that the two numbers complement each other and are not contradictory data.

Based on the results obtained by the researcher, the value of sig. (2-tailed) of 0.000 < 0.05, then it can be concluded that Ha is accepted and Ho is rejected, thus there is an influence of banana frond media on children's fine motor skills in the activity of filling in image patterns at the age of 4-5 years at Cempaka Aisyiyah 004 Kindergarten, Pulau Jambu Village, Kuok District, Kampar Regency. The value of t-count = −17.040 is greater than t-table = 2.160 with degrees of freedom (dk):

$$dk = n - k = 15 - 2 = 13$$

With the value dk = 13, then the t-count = −17.040 is greater than the t-table = 2.160, thus it can be concluded that Ho is rejected and Ha is accepted. Therefore, there is an influence of banana frond media on children's fine motor skills in the activity of filling in image patterns at the age of 4-5 years at Cempaka Aisyiyah 004 Kindergarten, Pulau Jambu Village, Kuok District, Kampar Regency.

Discussion

The initial problem that prompted this study was the low ability of group A students at Cempaka Aisyiyah 004 Kindergarten to control the small muscles of the fingers, accompanied by a lack of motivation for children to participate in activities that train fine motor skills. Departing from this problem, the researcher applied the activity of filling the image pattern with banana frond media, which was chosen because it offers an interesting tactile and visual experience while training the small muscles of the child's fingers in a fun way and according to their developmental stage. Printing is a fun medium of exploration and expression for children; through this activity, children gain inner satisfaction with the work produced, as well as train confidence, creativity, and courage to try new things (Iksan et al., 2020). Fine motor skills themselves are the organization of the use of small muscles such as fingers and hands that require precision and eye-hand coordination, as needed in various activities of daily life (Khadijah & Amelia, 2020). These two theoretical foundations are the main framework in interpreting the data obtained throughout the research process.

Statistically, children's fine motor skills at the initial test stage were on average 37.5% in the not yet developing category. Referring to Table 1, none of the children in the category are developing very well or developing as expected; Most children, namely 8 out of 15 children (53.33%), are still in the not yet developing category. When tracked by indicator, the highest achievement was found in the indicator of the ability to move the fingers of the hand (40.0%), while the lowest achievement was found in the indicator of the ability to produce a form of work (33.3%). The gap between these two indicators factually shows that children are

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basically able to move their fingers, but are not yet able to coordinate these movements into a complete work, in line with Khadijah & Amelia (2020) view that fine motor requires precision and more complex eye-hand coordination than just muscle movements.

At the first two treatment meetings, the child's ability increased from 37.5% to 44.6% (treatment 1) and 55.0% (treatment 2), both of which are still in the starting to develop category. Factually, at this stage the child begins to get used to holding a piece of banana fronds and pressing them on the drawing pattern, although the prints still often go out of the pattern line. This not drastic improvement in the early stages is natural because children are still in the process of adapting to the texture and way of using new media, before the small muscles of their fingers get used to the movement patterns demanded by printing activities.

More noticeable improvements began to be seen in the third and fourth treatments, namely 64.2% (the developing as expected category) and 76.3% (the developing very well category). At this stage, children begin to be able to adjust the position of their hands independently when printing and producing works with clearer and more creative shapes. The categorical leap from developing to developing very well within the span of these two encounters indicates that the child has passed the adaptation phase and is beginning to enter the skill mastery phase, where the repetition of the same movements consistently accelerates the formation of motor coordination (Khadijah & Amelia, 2020).

In the last two meetings, the child's ability continued to increase steadily to 86.3% (treatment 5) and 92.9% (treatment 6), both of which remained in the category of developing very well. At this stage, children are getting neat and meticulous in filling in the drawing pattern, and showing mature eye and hand coordination when positioning the banana fronds right on the intended part of the pattern. The sloping but consistent pattern of improvement in the last two meetings shows that children's skills are starting to approach the optimal point, so that the improvement that occurs is more of a *refinement of* the skills that have been formed than the formation of new skills.

In the final test, the child's fine motor ability reached an average of 97.1% with all 15 children (100%) successfully occupying the category of developing very well, as shown in Table 3. This comprehensive comparison between the initial test and the final test confirms that the activity of filling the image pattern with banana frond media, which was carried out repeatedly for six meetings, was factually able to change the achievement of children from the not yet developing category to developing very well in all research samples.

The significance of the increase was then statistically tested through an average difference test of two paired samples after the data was declared to be normally distributed. The test results showed a calculated value of −17.040 with a degree of freedom of 13, much greater than the table value of 2.160, and a significance level of 0.000 which was smaller than 0.05. The negative mark on the score statistically reflects the direction of the change, i.e. the average score after treatment is much higher than before treatment, not indicating a decrease in ability. Thus, statistically it can be ascertained that the improvement of children's fine motor skills is not caused by a coincidence factor, but is really influenced by the treatment in the form of filling in image patterns with banana frond media.

This finding is in line with Khadijah & Amelia (2020) that fine motor skills are reflected in the child's ability to move fingers with eye-hand coordination, as observed when children move their index and thumb fingers alternately to attach fronds to the pattern. Children's freedom to choose colors and expressions also facilitates the aspect of creativity (Iksan et al., 2020), so that the activity of printing with banana fronds not only trains physical agility but also provides space to experiment without fear of being wrong.

The results of this study also strengthen a number of studies on the use of local natural materials for children's fine motor skills. The use of local natural materials, including banana fronds, has been shown to be effective in improving fine motor due to its exploratory and malleable properties (L. Hasanah & Nurhasanah, 2020; Herlambang et al., 2023; Yanti et al., 2020), while the use of leaf media as an alternative to natural printing tools shows a similar pattern of improvement (Sidabutar & Siahaan, 2019). The similarity of the pattern of findings in different types of natural materials indicates that the main success factor is not only the type of material, but also the characteristics of natural materials that are textured, easy to grasp, and provide direct sensory feedback to children when used.

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More specifically, these findings are also in line with similar studies that use banana frond media directly. Barawati et al. (2023) and Salama & Ulpi (2023) both reported a significant improvement in children's fine motor skills after the implementation of printing activities with banana fronds, in line with the results of this study which showed an increase from the not yet developing category to developing very well. The similarity of the findings in these studies with identical media reinforces the belief that banana fronds are consistently effective as a fine motor stimulation medium in a wide range of early childhood populations, not limited to a single study site. Stamping techniques with other natural media such as carrots (Amalia et al., 2025) also show a positive and significant relationship with fine motor skills, supporting the idea that the principle of printing using natural objects held by the hand is generally effective in practicing finger-finger coordination, as also shown in *the finger painting* technique which utilizes tactile sensations directly from the child's fingertips (Listyowati & Sugiyanto, 2016).

In line with the printing technique used in this study, Sari et al. (2021) found that geometric pattern printing activities were also able to significantly improve fine motor skills in early childhood. These findings reinforce the assumption that printing techniques in general, whether using geometric stamps or banana fronds, both require children to coordinate hand pressure and positional accuracy, thus effectively training fine motor control regardless of the type of printing tool used.

Similar patterns of improvement were also found in studies with different techniques, such as collages using used materials (Darmiatun & Mayar, 2019), grain collages (Andreani et al., 2024), and collages in general (Wandi & Mayar, 2019). All three showed that giving children the opportunity to explore texture and shape through hands, as is also the case with banana fronds, consistently encourages improvement in fine motor skills. This corroborates the conclusion that the principle of success of fine motor stimulation lies in the active involvement of the child's hands with concrete materials, not in certain techniques alone.

In addition to the type of media, consistency and repetition of activities are also determinants of success, as shown in project-based learning activities (Mulandini et al., 2019) and puzzle games (Akbar et al., 2022) both of which are carried out gradually in several meetings. This pattern is consistent with the results of this study, where the most significant improvement occurred cumulatively over six treatment sessions, rather than at a single meeting, thus confirming the importance of repeating and continuous intervention design.

Although the results of this study show significant influence, some limitations need to be stated honestly. This study only involved one group without a comparative control group, so the observed improvement could not be completely separated from the possible effect of the child's natural maturation during the six treatment sessions. The limited sample size of 15 children in one PAUD institution also limits the generalization of findings to the early childhood population more broadly. Therefore, follow-up studies with control group designs as well as larger, more diverse samples are recommended to strengthen the validity of these findings.

Overall, optimal fine motor skills improve children's initial writing readiness (Falera, 2024; Suggate et al., 2019), considering that mature finger control is a prerequisite before children are able to hold stationery and form letters properly. Thus, banana frond media has not only proven to be statistically and factually effective in this study, but also worthy of being recommended as an alternative to low-cost, easily replicated, and local wisdom-based learning strategies for early childhood education educators, especially in areas with abundant availability of natural materials such as Kampar Regency.

CONCLUSION

The use of banana frond media in pattern-filling activities has a significant effect on the fine motor skills of children aged 4–5 years at Cempaka Aisyiyah 004 Kindergarten. The children's average ability increased gradually and consistently across treatment sessions, from 37.5% (not yet developing) in the pretest to 97.1% (developing very well) in the posttest. The t-count of −17.040 exceeded the t-table value of 2.160 with a significance level of 0.000 (< 0.05), so the null hypothesis was rejected. Banana frond media is therefore recommended as a low-cost, local wisdom-based learning medium for early childhood educators.

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