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The Influence of Ecoprint Activities with Belida Fish Pattern from South Sumatra on the Fine Motor Development of Children Aged 5–6 Years

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A BSTRA CT

As the field of early childhood education continues to evolve, various innovative learning methods have been implemented to support the development of children's fine motor skills. One method that has gained attention is ecoprint activities, which are known to enhance motor skills through artistic and creative engagement. This study aims to examine the effect of Ecoprint activities featuring the *Belida* fish pattern, a cultural symbol of South Sumatra, on the fine motor development of children aged 5–6 years at RA Jamiyatul Qurro KH. Burlian, Ogan Komering Ulu. The research employed a pre-experimental method using a one-group pretest-posttest design. A total of 15 children were selected as participants through purposive sampling. Data collection techniques included tests, observation, and documentation. The data were analyzed using a one-sample t-test. The results of the t-test showed that t_count = 4.30 ≥ t_table = 1.761, indicating that the alternative hypothesis (Ha) was accepted and the null hypothesis (Ho) was rejected. This finding suggests that ecoprint activities using the *Belida* fish pattern from South Sumatra have a significant effect on the fine motor development of children aged 5–6 years at RA Jamiyatul Qurro KH. Burlian, Ogan Komering Ulu.

Keywords : *Eco - Print Activities, Development Motor Smooth, Belida Fish, Children Age 5-6 Years.*

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INTRODUCTION

Children in the early years, specifically those aged 0-6, are in what is often referred to as the "golden age" of development. During this period, all aspects of a child's growth—physical, cognitive, emotional, and social—develop at an exceptionally rapid rate (Restuningtyas et al., 2023). This stage is crucial because it marks a time when children's potential can be nurtured most effectively, setting the foundation for future growth. Children at this age are highly responsive to various stimuli, entering what is known as a "sensitive period" where their physical and psychological functions are reaching maturity. As a result, this phase of development is unique, emphasizing the importance of proper guidance to ensure children can grow into well-rounded individuals (Indira et al., 2023).

Education must be forward-thinking, meaning it should be approached with care and planning to establish a solid foundation for the future. Through education, individuals can develop their innate potential, equipping themselves to face life's challenges and uncertainties. According to Law No. 20 of 2003, the National Education System Law, Article 1, paragraph 1 states that "Education is a deliberate and planned effort to create a learning atmosphere and process so that students actively develop their potential to gain religious, spiritual, emotional, social, intellectual, and moral competencies, along with the necessary skills for themselves, society, the nation, and the state." This law also affirms the importance of Early Childhood Education (ECE) as a means of guiding children from birth to age six through educational

stimulation, which helps their physical and spiritual growth, ensuring their readiness for further stages of education (Indira et al., 2023).

One formal educational unit for young children is Kindergarten, which is designed for children aged four to six. Children aged four to five are placed in Group A, while those aged five to six are placed in Group B. One key aspect of early childhood development that deserves attention is fine motor development. Nearly all activity children engage in requires the coordination of small muscles with other body parts, such as their hands, eyes, and feet. This coordination process is known as fine motor skills, which serve as the foundation for various abilities. As children grow, they must develop greater independence in performing activities. Fine motor skills can be nurtured through appropriate stimulation, which helps children refine their movements. By providing children with the right developmental stimuli, caregivers and educators help them perfect their skills, fostering greater independence as they progress through their growth stages. One key aspect of early childhood development that deserves attention is fine motor development. Nearly all activity children engage in requires the coordination of small muscles with other body parts, such as their hands, eyes, and feet. This coordination process is known as fine motor skills, which serve as the foundation for various abilities. As children grow, they must develop greater independence in performing activities. Fine motor skills can be nurtured through appropriate stimulation, which helps children refine their movements. By providing children with the right developmental stimuli, caregivers and educators help them perfect their skills, fostering greater independence as they progress through their growth stages.

Fine motor development refers to the ability to perform tasks that require coordination and control of small muscles, particularly in the hands and fingers. This development involves not only the refinement of small muscle movements but also the coordination between sensory inputs, such as sight and hearing. In early childhood, particular emphasis is placed on the coordination of hand movements—such as grasping, placing, or holding objects using the fingers (Wahyuningsih et al., 2023).

The growth of fine motor skills reflects an increasing ability to coordinate body movements with the use of small muscles and nervous system responses. These movements require careful precision, which depends on the integration between various small muscle groups and the brain's higher-order functioning. Fine motor skills are stimulated through intentional activities designed to encourage children to engage in small-movement tasks. These tasks not only strengthen motor control but also improve accuracy and purpose in children's actions. As a result, children are expected to gradually master fine motor abilities such as cutting with scissors (even if not perfectly straight), tying shoelaces, and coloring neatly—milestones appropriate to their developmental stage (Anhusadar, 2022). These skills must be nurtured through repeated opportunities and continuous practice to ensure steady progress.

To stimulate fine motor development in early childhood, activities must be both engaging and aligned with developmental objectives. One such activity that effectively supports this growth is ecoprinting. Ecoprinting involves transferring natural patterns—such as those from leaves or flowers—onto plain fabric surfaces by pressing or hammering them to release natural pigments (Mutmainah et al., 2022). This process requires children to coordinate their hand movements with visual perception, making it an ideal activity to train and enhance fine motor skills.

Beyond motor development, ecoprinting also stimulates children's creativity and environmental awareness, especially when the motifs used are associated with familiar objects in their surroundings. Using natural materials such as leaves and flowers from nearby plants makes the activity not only educational but also eco-friendly and culturally relevant.

According to the Minister of Education and Culture Regulation No. 137 concerning the National Standards of Early Childhood Education (ECE), children aged 5–6 years are expected to achieve several fine motor milestones. These include drawing based on imagination, imitating shapes, exploring different media, using writing and eating utensils properly,

cutting according to patterns, pasting pictures correctly, and expressing themselves through detailed drawings.

However, preliminary observations conducted over a week at RA Jamiyatul Qurro KH. Burlian revealed that not all children in the 5–6 age group had fully achieved the expected fine motor competencies. Among the 15 children observed, 10 were found to be below the developmental expectations for their age group. This finding indicates that further attention and stimulation—such as through ecoprinting or similar hands-on activities—are necessary to support and optimize children's fine motor development.

During the observation, the researcher identified that 10 children experienced difficulties in coordinating their eye and hand movements. This issue became evident when the children were unable to follow cutting patterns properly while performing tasks that required the use of scissors. The difficulty stemmed from incorrect scissor-holding techniques. Ideally, a child should hold scissors with the thumb placed in the upper loop and the middle and index fingers in the lower loop, while the other hand holds the paper or object to be cut. However, two of the children were observed placing both their thumb and index finger into the scissor holes, which resulted in a weak grip and lack of control, leading to uneven and inaccurate cutting. Additionally, eight children used both hands to hold the scissors, making it impossible to simultaneously hold the paper. As a result, they required assistance from others during the cutting activity.

Another issue was observed during a mosaic activity, where the teacher instructed the children to paste pieces of paper onto a given pattern. The same 10 children struggled to follow the designated outlines, pasting the paper outside the intended area, resulting in disorganized and untidy mosaic artworks. Furthermore, during a number symbol recognition activity, the children were asked to imitate number shapes using a pencil. These 10 children also had difficulty copying the number symbols accurately, leading to untidy and incorrect writing. This was primarily caused by improper pencil grip. The children were seen holding pencils using a full-hand grip (known as a fist grip), rather than the recommended dynamic tripod technique. In the correct grip, the pencil should be held between the thumb and index finger, with the pencil resting on the middle finger, allowing for better control and precision.

These observations are supported by previous research. For example, a study conducted by Latifah and Ismet (2023) entitled "The Influence of Ecoprint Batik on the Fine Motor Development of Children at Istiqamah Islamic Kindergarten, Payakumbuh City" found that ecoprint batik activities can effectively stimulate various aspects of child development, particularly fine motor skills. These activities promote eye-hand coordination and boost children's confidence through the creation of visually appealing batik patterns. Similarly, Rahma (2021) in her study "Improving Fine Motor Development in Early Childhood Aged 4–6 Years through the Use of Natural Materials and Ecoprint Techniques at Nurfajrin Kindergarten, Takalar District", demonstrated that using natural materials in ecoprint activities improved children's fine motor skills. The indicators of improvement included enhanced coordination of eyes and hands during complex movements, cutting patterns creatively, and controlling hand movements using fine muscles. The percentage increase in these indicators from cycle 1 to cycle 2 reached 77.1%, 77.5%, and 78.75%, respectively.

This is the underlying reason why the researcher is interested in conducting a study on the influence of ecoprint activities using the Belida fish pattern, a cultural icon of South Sumatra, on the fine motor development of children aged 5–6 years at RA Jamiyatul Qurro KH. Burlian. In addition to examining the impact of ecoprint activities on children's fine motor skills, incorporating the Belida fish as a motif in the ecoprint design also serves to enrich children's knowledge and foster a sense of appreciation and pride for a distinctive and iconic cultural symbol from their region.

METHOD

The type of research conducted is classified as experimental research, focusing on the influence of ecoprint activities on the fine motor development of children aged 5–6 years. This aligns with the definition of experimental research, which aims to determine whether a particular treatment or intervention has an impact on a certain condition. Accordingly, this study adopts a quantitative approach to analyze research data. Quantitative research is grounded in positivist philosophy, which emphasizes measurable, objective, and factual knowledge. It involves studying a specific population or sample using research instruments and statistical analysis to objectively test hypotheses.

The research design employed is a pre-experimental design, specifically the "one-group pretest-posttest" design. This design involves a single group of participants who are assessed before and after receiving the treatment, without a comparison group.

Population and Sample

The population in this study consists of children aged 5–6 years enrolled at RA Jamiyatul Qurro KH. Burlian, totaling 21 children. The sample was selected using purposive sampling, which involves choosing participants based on specific criteria relevant to the research objectives. Since the study focuses on children aged 5–6 years, only 15 children from the total population met this criterion, while the remaining 6 children were 4 years old. Therefore, the sample comprised 15 children.

Data Collection Techniques

Data collection was carried out using three techniques: tests, observation, and documentation. The test was administered in two stages: pretest (before treatment) and posttest (after treatment). During the ecoprint activity using the Belida fish pattern, the researcher observed children's performance to assess the development of fine motor skills. The indicators used for observation included proper use of stationery, cutting, pasting, and coordination of eye and hand movements. Documentation was collected in the form of photographs showing the research process, classroom atmosphere, school environment, and relevant documents such as the school's vision and mission.

Research Procedure

The research began with a pretest, followed by a treatment phase, and concluded with a posttest. The steps in the pretest and posttest activities were as follows: The researcher first introduced the tools and materials needed for the ecoprint activity, including A4 paper, teak leaves (chosen for their color-retention and ease of use), scissors, markers, pencils, clear plastic sheets, adhesive (double-sided tape), and an ecoprint pounding tool. The children were guided to trace dotted-line patterns of the Belida fish on both paper and leaves using pencils and colored markers. After thickening the patterns, they cut the leaves according to the outlined shapes and pasted them on the paper, aligning them with the pre-drawn Belida fish pattern. The children then used the pounding technique to extract colors from the leaves onto the paper, with plastic sheets placed above and below as protection. The completed work was set aside to dry, and materials were cleaned up afterward.

Treatment Implementation

The treatment phase was conducted over several sessions, each targeting specific fine motor skill indicators. During sessions 2, 3, 4, 6, 9, 10, and 11, activities focused on enhancing children's ability to use stationery correctly by guiding them to thicken the outlines of Belida fish patterns—starting from the edges, progressing to internal details like fins and eyes, and culminating with the complete pattern on teak leaves. Sessions 5, 7, 12, and 14 emphasized improving cutting skills, where children practiced cutting teak leaves according to the Belida fish outlines to develop precision and control in using scissors. Finally, in sessions 8, 13, and 15, children practiced pasting the cut leaves onto tote bag fabric, aligning them with the pre-

drawn fish patterns, and then applied the pounding technique to transfer natural colors, which also supported the development of eye-hand coordination through precise and rhythmic movement.

Posttest

After the final treatment session, a posttest was administered to evaluate the improvement in fine motor skills resulting from the ecoprint activities. The results were analyzed based on the previously established indicators to determine the effectiveness of the treatment.

FINDINGS AND DISCUSSION

Validity testing is conducted to see whether the instrument used is valid or not. This study uses a content validity test where the test uses a measuring instrument in the form of an observation sheet which will later be tested by expert lecturers. In addition, researchers will also conduct field tests to see whether the observation sheet used is valid or not. Results of the calculation validity test in research This use SPSS Pearson Product Moment version 27.

Table 1. Validity Test Results

Correlations

		Item_1	Item_2	Item_3	Item_4	Item_5	Total
Item_1	Pearson Correlation	1	.751 *	.690 *	.690 *	.821 **	.917 **
	Sig. (2-tailed)		.012	.027	.027	.004	.000
	N	10	10	10	10	10	10
Item_2	Pearson Correlation	.751 *	1	.605	.806 **	.751 *	.900 **
	Sig. (2-tailed)	.012		.064	.005	.012	.000
	N	10	10	10	10	10	10
Item_3	Pearson Correlation	.690 *	.605	1	.500	.518	.772 **
	Sig. (2-tailed)	.027	.064		.141	.125	.009
	N	10	10	10	10	10	10
Item_4	Pearson Correlation	.690 *	.806 **	.500	1	.690 *	.853 **
	Sig. (2-tailed)	.027	.005	.141		.027	.002
	N	10	10	10	10	10	10
Item_5	Pearson Correlation	.821 **	.751 *	.518	.690 *	1	.875 **
	Sig. (2-tailed)	.004	.012	.125	.027		.001
	N	10	10	10	10	10	10
Total	Pearson Correlation	.917 **	.900 **	.772 **	.853 **	.875 **	1
	Sig. (2-tailed)	.000	.000	.009	.002	.001	
	N	10	10	10	10	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Source: *Data processed in 2025*

Based on Table 1 above, it is known that the value of N is 10, which means the t-table value at a 5% significance level is 0.632. If the calculated r-value (r count) is greater than the r-table value, then the instrument can be declared valid. Subsequently, a reliability test was conducted. Instrument reliability was tested using internal consistency, meaning the instrument was administered once, and the resulting data was then analyzed. The reliability test was performed using the Cronbach's Alpha formula, and the analysis was carried out using SPSS version 27 with the Pearson Product Moment method.

Table 2. Reliability Test Results

Reliability Statistics

Cronbach's Alpha	N of Items
.912	5

Source: *Data processed in 2025*

The instrument can be said to be reliable if *the Crobvach Alpha value is* > 0.6. If *the Crobvach Alpha value obtained is 0.912,* then the instrument in this study can be said to be reliable with the results of 0.912 > 0.6. Test is conducted using the *Chi Square formula.* The normality test is conducted to determine whether the distribution of data in the study is normally distributed or not. Data can be said to be normal if the $x^2_{\text{calculated value}}$ is smaller than the $x^2_{\text{table value}}$ and vice versa. Based on the results of the calculation using the *chi square formula* , here are the results of the normality test.

Table 3. Calculation Results Normality Using Chi Square

No	Interval Class	Real Limits	Z *Score*	Class Limits	Area of the Region	f_h	f_0
		100.5	1.61	44.63			
1	82-100				35.23	5.28	7
		81.5	0.23	09.10			
2	63-81				-28.19	4.22	6
		62.5	-1.14	37.29			
3	44-62				-3.14	0.47	2
		43.5	-2.53	40.43			
4	25-43						
		24.5					0

Source: *Data processed in 2025*

Table 4 Chi Square Calculation

No	f_0	f_h	$(f_0 - f_h)$	$(f_0 - f_h)^2$	$\frac{(f_0 - f_h)^2}{f_h}$
1	7	5.28	1.72	2.95	0.55
2	6	4.22	1.78	3.16	0.74
3	2	0.47	1.53	2.34	4.97
4	0				
			Amount	$x^2 =$	**6.26**

Source: *Data processed in 2025*

Based on the chi-square calculation results in the table above, the obtained chi-square value (χ^2 count) is 6.26. Using the formula n–1 and a 5% significance level, the chi-square table value (χ^2 table) is 23.68. Data is considered normally distributed if the χ^2 count is less than the χ^2 table value. Therefore, it can be concluded that the data in this study is normally distributed, as 6.26 ≤ 23.68. Referring to the main objective of this study—to determine whether ecoprint activities using the Belida fish pattern influence the fine motor development of children aged 5–6 years at RA Jamiyatul Qurro KH. Burlian Ogan Komering Ulu—a t-test was conducted to obtain the answer. The following section outlines the steps taken to perform the t-test.

Count t_{count}

Before doing the calculation, especially formerly determine average and standard values its deviation. Here results of t-test calculation in this research.

It is known:

$\bar{x}$: 78.3

μ_0 : 63

S : 13.75

n : 15

$$t_{count} = \frac{\bar{x} - \mu_0}{S / \sqrt{n}}$$

$$t_{count} = \frac{78{,}3 - 63}{13{,}75 / \sqrt{15}}$$

$$t_{count} = \frac{15,3}{13,75 \,/\, 3,87}$$

$$t_{count} = \frac{15,3}{3,55}$$

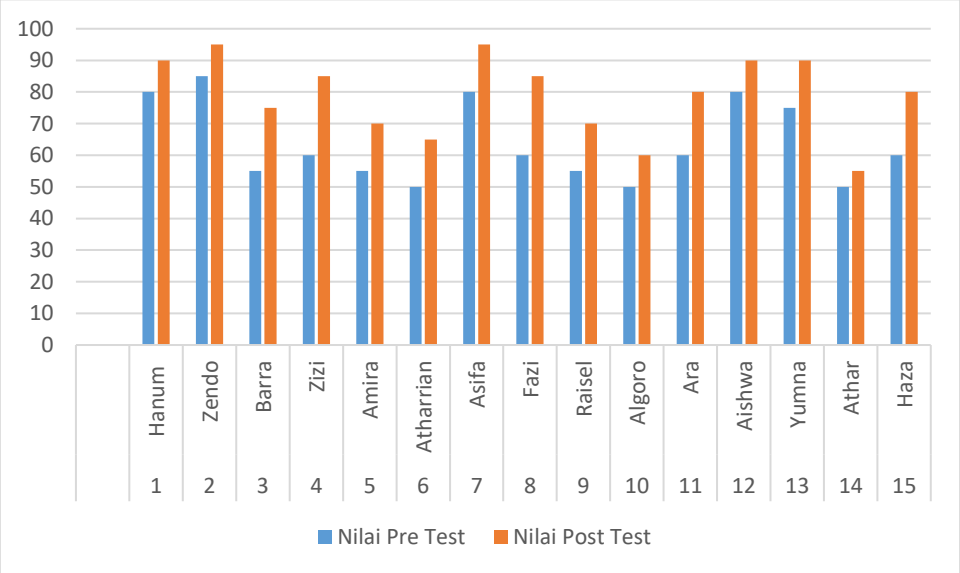
$$t_{count} = \mathbf{4,30}$$

Count t_{table}

The **t** value generated from the t-distribution value (attached) where the probability$(1 - \alpha)$ and dk $(n - 1)$. If the number of dk = (15-1) = 14, value α= 5%, then the **t table value = 1.761.**

Determination Decision Testing Hypothesis

The decision to test the hypothesis in this study was based on the following criteria: if the t-count ≥ t-table, then Ha is accepted and Ho is rejected; conversely, if the t-count ≤ t-table, then Ha is rejected and Ho is accepted. Based on the t-test calculations, the obtained t-count was 4.30, while the t-table value at a 5% significance level was 1.761. Since 4.30 ≥ 1.761, Ha is accepted and Ho is rejected. Therefore, it can be concluded that there is a significant influence of ecoprint activities using the Belida fish pattern, a cultural icon of South Sumatra, on the fine motor development of children aged 5–6 years at RA Jamiyatul Qurro KH. Burlian, Ogan Komering Ulu.



Source: Data processed in 2025

Figure 1. Recapitulation of *Pre-Test* and *Post-Test* Results

Based on the results of data analysis and hypothesis testing, it can be concluded that ecoprint activities using the Belida fish pattern—an iconic symbol of South Sumatra—have a significant influence on the fine motor development of children aged 5–6 years at RA Jamiyatul Qurro KH. Burlian, Ogan Komering Ulu. The research findings show a notable improvement, with the average pretest score rising from 60.6 to 78.3 in the posttest, indicating a significant increase in the children's fine motor skills after the intervention.

The ecoprint activity contributed positively to the fine motor development of these children, particularly in response to the challenges previously observed in their motor skills. At the age of 5–6 years, children are expected to be able to use writing tools correctly, draw or trace shapes, cut and paste according to patterns, and coordinate eye and hand movements during various tasks. However, prior to the intervention, many children had not yet reached these developmental milestones. Therefore, ecoprint was selected as a stimulating activity to support the development of fine motor skills. The activity was expected to have a positive

impact, and the results showed significant improvement in the targeted developmental indicators.

The ecoprint process aligns well with the developmental goals of fine motor skills. Through the various stages of the activity—tracing patterns, cutting, pasting, and pounding leaves—children are actively engaged in tasks that require precise control and coordination. These steps are directly connected to fine motor achievements, such as the correct use of writing tools, following visual patterns, and executing tasks requiring eye-hand coordination. After receiving treatment through ecoprint activities, children who previously displayed developmental delays were able to reach age-appropriate levels of fine motor development, as evidenced by posttest scores.

Indicator 1: Using Writing Tools Correctly (Drawing or Tracing Shapes)

Two activity items were used to assess this indicator: (1) tracing the Belida fish pattern on paper, and (2) tracing the same pattern on a teak leaf. In the paper tracing activity, 3 out of 15 children (20%) achieved a score of 4, 9 children (60%) scored 3, and 3 children (20%) scored 2. For tracing on the teak leaf, 5 children (33%) scored 4, 7 children (46%) scored 3, and 3 children (20%) scored 2. According to Nurhayati et al. (2021), supporting children's writing skills can be done by teaching them to trace shapes, follow dotted lines, and imitate patterns—activities that were fully integrated into the treatment in this study. Repeated practice helps children become more proficient in gripping and using a pencil correctly, ultimately contributing to improved fine motor control.

Indicator 2: Cutting and Pasting According to Patterns

Two activity items were assessed: (1) cutting teak leaves based on the Belida fish pattern, and (2) pasting the cut leaves onto the corresponding pattern on the fabric. In the cutting activity, 5 children (33%) scored 4, 7 children (46%) scored 3, and 3 children (20%) scored 2. Cutting is an effective way to train fine motor skills, as it involves precise finger control and coordination (Suary et al., 2022). According to Mulyono (2024), mastering cutting skills becomes an essential foundation for children to perform daily tasks independently.

In the pasting activity, 7 children (46%) scored 4, 7 children (46%) scored 3, and 1 child (6%) scored 2. A child is considered to have pasted well when the object is accurately placed within the given boundary (Fitrianingsih et al., 2022). In the ecoprint activity, this meant correctly positioning the leaf onto the Belida fish pattern previously drawn and bolded. Overall, the results demonstrate that ecoprint activities not only stimulate creativity and cultural awareness but also serve as an effective tool for enhancing fine motor development. The improvements observed in the children's posttest performance confirm that ecoprinting, as an engaging and hands-on learning method, can be successfully integrated into early childhood education to support developmental milestones.

Indicator 3: Coordinating Eye and Hand Movements in Performing Tasks

To assess this indicator, children were involved in an activity that required them to pound leaves, one of the key stages in the ecoprint-making process. In this activity, 4 out of 15 children (26%) achieved a score of 4, 9 children (60%) scored 3, and 2 children (13%) received a score of 2. This pounding activity demands both focus and physical coordination, as it requires precise eye-hand coordination and consistent force to effectively extract pigment from the leaves (Sitorus, 2024).

During this activity, both hands play a vital role: one hand is responsible for holding or stabilizing the media, while the other controls the intensity and consistency of the pounding. At the same time, the child's visual focus is essential—they must ensure that the leaf remains aligned with the pattern and that each section is evenly pounded. These combined demands demonstrate a strong connection between this activity and the development of fine motor skills, specifically in coordinating eye and hand movements to complete tasks accurately.

Fine motor development is essential for children as it supports their ability to perform everyday tasks such as dressing, writing, feeding themselves, and creating art. If a child's fine

motor skills are well developed, they are more likely to perform these tasks independently and actively engage in various learning experiences (Rezieka et al., 2022). The treatment provided in this study—namely, engaging children in ecoprint activities—effectively stimulated fine motor development, especially for children who had not yet reached expected developmental milestones. As their muscle control and coordination improved, the children were able to meet age-appropriate fine motor expectations, making them better prepared for the next stage of education.

The ecoprint activity has proven to be not only effective but also highly beneficial in supporting the growth of fine motor skills in young children. According to Martuty (n.d.), ecoprint is one of the most effective methods for developing fine motor abilities, as it integrates multiple skills into a single, engaging process. It allows children to practice tracing, cutting, aligning, pasting, and pounding—all of which contribute to the refinement of their motor skills. With the implementation of this activity, children's fine motor problems can be addressed more effectively. The data analysis results from this study clearly demonstrate the positive impact of ecoprint activities on fine motor development. The significant improvement in children's posttest scores compared to their pretest scores reflects meaningful progress. By achieving these developmental milestones, children become more confident and capable of handling fine motor tasks independently—an essential foundation for success in their continuing educational journey.

CONCLUSIONS

This study demonstrates that ecoprint activities featuring the Belida fish pattern have a significant positive effect on the fine motor development of children aged 5–6 years at RA Jamiyatul Qurro KH. Burlian, Ogan Komering Ulu. The pretest-posttest analysis revealed a notable improvement in fine motor skills, as confirmed by the statistical results ($t_{count} = 4.30 \geq t_{table} = 1.761$), which led to the acceptance of the alternative hypothesis. These findings suggest that integrating ecoprint activities into early childhood education can be an effective and engaging method to enhance children's fine motor abilities, providing them with the foundational skills necessary for future learning and development.

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