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The Effect of Beading Activities on the Fine Motor Skills of Children Aged 4–5 Years at TK Labschool Unesa 1

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ABSTRACT

This study aims to determine the effect of beading activities on the fine motor skills of children aged 4–5 years at TK Labschool Unesa 1. The background of this research problem is the lack of stimulation in fine motor activities, causing children to experience difficulties in pinching small objects, controlling finger movements, and performing activities requiring hand–eye coordination. This study employed a quantitative approach with a one-group pretest–posttest design. The subjects were 31 children from Group A. Data were collected through observation using an assessment sheet covering children's flexibility, finger strength, and accuracy, and analyzed using the paired sample t-test. The results showed a significant difference between the pretest and posttest scores after the children participated in beading activities. The average score before treatment (pretest) was 44%, and after

treatment (posttest) was 71%, with a score difference of 27%, indicating the influence of beading activities. This influence was evident from improvements in children's ability to pinch, insert beads, and coordinate their hands and eyes after participating in beading activities. This occurred because the researcher provided three treatments and followed beading stages appropriate to the children's developmental age.

Introduction

Early Childhood Education (ECE) is a form of education that provides a strong foundation for the holistic growth and development of children to stimulate various aspects of their development. ECE institutions are places where children receive developmental stimulation. Through early education, children will not only be ready to continue to higher education levels but also optimize all developmental domains (Dina & Purnamasari, 2023). Optimal development not only prepares children for primary school but also enhances motor, cognitive, and socio-emotional maturity (Haryaningrum et al., 2023).

Maulidiyah et al. (2025) explained that children's abilities need to be continuously stimulated to achieve optimal development appropriate to their age, as this determines their readiness for the next educational stage. Therefore, it is important to provide stimulation while still paying attention to all aspects of children's development, including motor development, both gross and fine. Fine motor development is often slower than gross motor skills, thus requiring

appropriate stimulation so that children do not experience difficulties in activities involving hand skills, such as beading, cutting, and others (Yulidah & Simatupang, 2025).

Based on findings at the institution, it was known that the fine motor skills of Group A children at TK Labschool Unesa 1—particularly in finger coordination and flexibility—had not yet developed optimally. This was seen during cutting and beading activities, where 10 children from Group A1 and 8 children from Group A2 experienced difficulties in completing tasks and needed assistance from teachers. Children were not yet skilled in moving their fingers and had trouble coordinating speed and accuracy. As children grow, their abilities improve, enabling them to understand their talents, become more active in activities they enjoy, and more easily follow instructions when given appropriately. Therefore, it is important for teachers to understand each child's character (Damayanti & Adhe, 2023).

According to Churiyah & Hasibuan (2024), the role of educators is not only to teach but also to guide, support, and inspire children. Beading activities were chosen by the authors as one approach to improve fine motor skills in children aged 4–5 years at TK Labschool Unesa 1. Through beading activities, children learn to coordinate eye and hand movements and train their focus in carrying out activities. For children, beading is not merely arranging beads into certain shapes but a process rich in learning and holistic development, training focus, stimulating imagination, and encouraging creativity (Margaritiviera et

al., 2023).

Rahmaningrum et al. (2024) revealed that the best games for children are those that involve all the senses, enabling them to function optimally according to the child's stage of development. Thus, beading for young children is conducted through a play-based learning approach. In play, there is no difference between expensive and simple toys in measuring success; during play, children naturally develop many aspects of their growth (Widayanti et al., 2023). Childhood is a time for free expression, so the concept of play remains central in school art activities (Nurmiyanti & Candra, 2019). Young children need real-life, engaging learning, not merely paper-and-pencil activities. Learning should be joyful so that children enjoy the process (Chayanti & Setyowati, 2022).

Children are naturally active, adventurous, and enjoy exploring new things; therefore, they need enjoyable activities that also hone their creativity and fine motor skills (Jessica & Adhe, 2020). The choice of media also determines children's interest. Ramawati & Komalasari (2023) stated that monotonous, unattractive media can make children bored and less interested in participating. In this study, beads of various colors, shapes, and sizes were used, along with clear nylon string because it has several advantages: flexibility, ease of insertion into bead holes, transparency so as not to interfere with bead colors and patterns, and safety for early childhood use. Thus, thread selection should be adjusted to the type of beading to be used and in accordance with the

child's developmental stage.

Methods

This study used an experimental approach with a pre-experimental design. The purpose of the experimental approach is to identify the relationship and influence between independent and dependent variables (Adnan & Latief, 2020). The research design applied was the one-group pretest–posttest design, in which the pretest was conducted before treatment was given, and the posttest was conducted to measure the results after the treatment was applied (Arib et al., 2024).

The research subjects were 31 children from Group A at TK Labschool Unesa 1, located in Building M5, Unesa Ketintang Campus, Gayungan District, Surabaya City. The instrument used was an observation sheet that had been validated by experts and tested for reliability with Cronbach's Alpha value. Data collection techniques were carried out through direct observation and photo documentation. The data obtained were analyzed using the normality test (Shapiro–Wilk), homogeneity test (Levene's Test), and hypothesis testing using the dependent t-test (paired t-test) because the data were normally distributed.

Results and Discussions

This research was conducted to determine the effect of beading activities in improving the fine motor skills of children aged 4–5 years at TK Labschool Unesa 1. The assessment was based on three indicators of children's fine motor skills: flexibility, finger strength, and accuracy.

Before being used to measure children's development, the research instrument in the form of an observation sheet was first tested for validity and reliability.

The validity test in this study was conducted to determine the feasibility of the instrument before being used in the data collection process. The validity test was carried out through expert validation and the Pearson Product Moment correlation technique. The results showed that all instrument items had a calculated r-value greater than the table r-value, so they were declared valid. Next, a reliability test was conducted to determine the extent to which the research instrument would remain consistent if used under similar conditions.

Table 1. Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
0.776	5

The reliability test was conducted using the Cronbach's Alpha formula and yielded a value of 0.776, which falls into the very high reliability category. This indicates that the instrument used is consistent and suitable for use in the research.

Before the treatment was given, a pretest was conducted to measure the children's initial abilities in Group A. The highest score achieved by the children was 9, while the lowest was 4. In the pretest, children were instructed to bead according to the materials and tools provided, with a free design and no specific theme or requirements. This activity aimed

to observe the extent of their fine motor skill development.

Picture 1. Pretest Work Results

After the pretest, the next step was to provide treatment to the children. The treatment was carried out over three sessions:

- **Treatment 1:** The level of difficulty was relatively easy as the children began to recognize the various bead colors. They were asked to bead using one favorite color.
- **Treatment 2:** The difficulty increased as children were asked to remember a pattern dictated by the teacher. They beaded using one favorite color with a white bead separator.
- **Treatment 3:** The difficulty was the highest because children were required to remember shapes and patterns dictated by the teacher and bead according to a predetermined design (e.g., bow–square–square).

Picture 2. Treatment Work Results

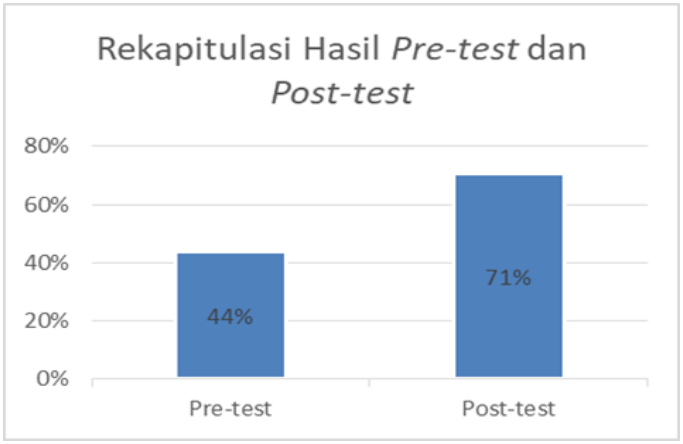
After the treatment, the same posttest assessment as the pretest was

administered to verify any improvement in fine motor skills after beading activities. The highest posttest score was 13, and the lowest was 8.

Picture 3. Posttest Work Results

After obtaining the pretest and posttest results, a recapitulation process was conducted to determine whether beading activities influenced the improvement of fine motor skills. This was determined by comparing children's abilities before and after the treatment. If the treatment had an effect, children would show progress in their skills and knowledge.

Picture 4. Pretest and Posttest Recapitulation



From the overall comparison, the average pretest score was 44%, while the posttest score increased to 71%, with a difference of 27%. This indicates that beading activities influenced the improvement of fine motor skills in children aged 4–5 years at TK Labschool Unesa 1.

To determine data distribution, a normality test was conducted using the Shapiro–Wilk method in SPSS because the research sample was relatively small.

Table 2. Normality Test Results

Statistic	df	Sig.
Pretest	0.936	0.062
Posttest	0.914	0.017

The normality test criterion is that data are considered normal if the Shapiro–Wilk significance value is greater than 0.05. Based on the analysis, all data were normally distributed with pretest sig. = 0.062 and posttest sig. = 0.017.

After confirming normal distribution, a homogeneity test was conducted using Levene's Test to assess sample equality.

Table 3. Levene's Test Results

Levene Statistic	df1	df2	Sig.
Based on Mean	0.298	1	60
Based on Median	0.227	1	60
Based on Median and adjusted df	0.227	1	59.989
Based on Trimmed Mean	0.269	1	60

Data are considered homogeneous if the significance value is greater

than 0.05. Based on the results, all data were homogeneous. The hypothesis test used the dependent t-test (paired t-test) because the data were normally distributed. This test aimed to determine whether beading activities had a significant effect on fine motor skills.

Table 4. T-Test Results

Paired Sample T-Test (Pretest–Posttest)	Sig. (2-tailed)
	0.000

The criterion for significance is that Ha is accepted and H0 is rejected if sig. (2-tailed) < 0.05. The result was sig. = 0.000, indicating a significant difference between pretest and posttest scores.

The findings show that after the beading activity treatments, children's fine motor skills improved significantly. There was progress in finger flexibility, pinching strength, and accuracy in arranging beads. This supports Hurlock's theory (1978) that fine motor development is crucial for enhancing concentration, independence, and readiness for school tasks.

The stages implemented included: introducing the beading materials, selecting age-appropriate media (beads with holes not too small, slightly rigid thread for easy insertion), building children's interest with attractive colors and shapes, and giving simple, clear instructions adapted to their understanding. Steps were conducted gradually, allowing children to work comfortably at their own pace.

Beading activities are suitable for children in the preoperational stage (ages 4–5), when they actively use symbols, enhance imagination, and

learn through concrete experiences (Aprilia & Hasibuan, 2021). This is consistent with Haeriah Syamsudin's statement (in Fitria, 2018) that beading can enhance finger skills and provide enjoyable learning with significant developmental value.

During the pretest, many children struggled to control hand and finger movements, pinch small beads, position the thread, and arrange patterns. Their hand–eye coordination was still lacking, and their work lacked accuracy and neatness. During the treatments, children began to improve, showing greater focus, persistence, and enthusiasm, often sharing and discussing their work with peers.

After the treatments and posttest, significant improvement was evident. Children became more skilled, accurate, and confident, also showing more positive attitudes toward challenging, precise activities. These findings align with Kurniasih (2022), who states that beading benefits fine motor development while introducing children to bead colors, sizes, and shapes, and proper beading techniques.

Conclusion

From the results, it can be concluded that after participating in beading activities, children demonstrated better abilities in moving their fingers, holding beads, and arranging patterns more precisely and in a coordinated manner. This was evident from the difference between pretest and posttest results, which showed an increase of 27% (from 44% to 71%). The study also emphasizes that structured preparation before the activity—such as introducing materials, letting children choose

favorite colors, and arranging patterns progressively from simple to complex—significantly contributes to success. Planned, developmentally appropriate beading activities can be an effective strategy to enhance fine motor skills in early childhood.

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