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# The Effect of Finger Painting on Early Childhood Artistic Expression: A Quasi-Experimental Study

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**Keywords:** Finger painting method, Early childhood creativity, Art-based learning.

**Abstract:** Creativity in early childhood often remains underdeveloped due to structured, teacher-centered instruction that limits children's opportunities for exploration. This study examined the effectiveness of the fingerpainting method in enhancing coloring creativity among children aged 5–6 years at TK Islam Al Husna, Salatiga. Using a quasi-experimental design with non-equivalent control and experimental groups, two classes were compared: Class B1 received finger painting activities, while Class B4 followed conventional instruction. Data were collected through validated observation sheets and analyzed using SPSS 26. Results showed that children who engaged in finger painting demonstrated markedly higher creativity scores than those in the control group. These findings suggest that finger painting offers an effective, sensory-based approach for promoting creativity in early childhood. Unlike previous studies that focused on traditional art instruction, this research highlights the value of tactile, exploratory learning experiences that enable children to express their ideas more freely. This study extends earlier work by providing empirical evidence from an Indonesian early childhood context, where structured, conformity-based instruction still predominates. It contributes to the global understanding of how culturally responsive, sensory-rich art activities can serve as powerful tools to foster creativity and expressive freedom among young learners.

## Introduction

Creativity is a key component of early childhood development, enabling children to express ideas, solve problems, and adapt to new experiences (1-3). In early education, it supports cognitive flexibility, emotional growth, and curiosity, skills essential for lifelong learning (4). Yet, in many Indonesian preschools, creativity remains underdeveloped because classroom activities often emphasize neatness, imitation, and uniform results rather than exploration and originality (5-7). Many early childhood classrooms in Indonesia still rely on rote learning and guided coloring activities that prioritize neatness and conformity over originality and expression (8).

This issue is urgent in Indonesia, where teacher-centered instruction and product-oriented art tasks, such as worksheet coloring, still dominate classroom practice (9). These approaches restrict children's imagination and conflict with the *Merdeka Belajar* curriculum, which promotes independence, creativity, and discovery-based learning (10). Without opportunities for sensory exploration and experimentation, children's artistic expression risks becoming mechanical instead of imaginative (11).

From a sociocultural and constructivist perspective, creativity emerges through interaction, sensory engagement, and experimentation (12). Art-based experiential methods, especially finger painting, offer meaningful opportunities for children to explore textures, colors, and emotions while developing fine motor and cognitive skills (13). International studies (2020-2024) have shown that such methods effectively enhance imagination and creative confidence (14). However, most existing research comes from Western or East Asian contexts with strong art education traditions, while evidence from Indonesian early childhood settings remains limited.

Therefore, this study aims to examine the effect of the finger painting method on the creativity of children aged 5–6 years at TK Islam Al Husna, Salatiga. By situating the investigation within the Indonesian cultural and educational context, this research seeks to fill a gap in the literature and demonstrate how sensory-based, hands-on art learning can strengthen creativity in early childhood education (20).

## Methodology

### Study Design

This study employed a quasi-experimental design with non-equivalent control and experimental groups to examine the effectiveness of the finger painting method in enhancing early childhood creativity. Class B1 served as the experimental group and received finger painting activities, while Class B4 served as the control group and participated

in conventional coloring lessons. This design maintained ecological validity by reflecting authentic classroom conditions without random assignment.

### Participants and Setting

The study was conducted at TK Islam Al-Husna, a private kindergarten in Salatiga, Central Java, Indonesia, during the 2024/2025 academic year. The school applies the *Merdeka Belajar* curriculum, emphasizing child-centered and play-based learning, making it suitable for creativity-focused research. A total of 34 children aged 5–6 years participated, 17 in each group, selected purposively based on comparable developmental levels and class size.

### Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee of Universitas Islam Negeri (UIN) Salatiga (Approval No. 421.1/212/PIA_06/2024). Written parental consent was obtained before participation. All participants' identities were kept confidential, and anonymity was ensured throughout data collection and analysis.

### Instruments

Creativity was assessed using a validated observation sheet and a structured questionnaire adapted from national early childhood development standards (*Standar Tingkat Pencapaian Perkembangan Anak*, STPPA). The instruments measured observable indicators such as originality, color combination, and independence.

Validity was tested using Pearson's correlation ($r > 0.339$), and reliability was confirmed with Cronbach's alpha coefficients above 0.70, indicating good internal consistency. Interrater reliability was ensured through training sessions for two independent raters who scored the children's work separately and compared results to reach consensus.

### Procedures

Data collection was carried out through three stages: pretest, intervention, and posttest. Both groups first completed a baseline coloring task to measure initial creativity levels. The experimental group (B1) then participated in a 40-minute finger painting session using non-toxic paints and A3 paper, allowing free exploration of color and form with minimal teacher direction, while the control group (B4) engaged in a conventional worksheet-based coloring activity emphasizing neatness and conformity.

After the intervention, both groups repeated the same creativity assessment to compare outcomes. All artworks were anonymized and independently scored by trained raters, with discrepancies resolved through discussion to ensure objectivity and reliability.

### Data Analysis

Quantitative data were analyzed using IBM SPSS Statistics (Version 26). Instrument validity was assessed via Pearson's correlation, reliability via Cronbach's alpha, and normality using the Shapiro–Wilk test. Homogeneity was confirmed with Levene's test.

Differences between groups were analyzed using independent and paired samples t-tests. Statistical significance was set at $p < 0.05$ (two-tailed). Effect size (Cohen's d) was calculated to determine the magnitude of differences.

## Results

### Research Site Context

The study was conducted at TK Islam Al-Husna, a private Islamic kindergarten in Salatiga City, Central Java, during the 2024/2025 academic year. The institution implements Indonesia's *Merdeka Belajar* curriculum, emphasizing play-based and child-centered learning integrated with faith-based values. This pedagogical orientation supports creativity, critical thinking, and collaboration, providing a suitable environment for implementing experiential learning methods such as finger painting. Two comparable classes, B1 and B4, participated in the study as the experimental and control groups, respectively.

### Control and Experimental Classes

The control group (Class B4) consisted of 17 students who participated in conventional art-based activities that followed a teacher-centered model, focusing on worksheet-based coloring, emphasizing neatness and precision. In contrast, the experimental group (Class B1), also comprising 17 students, engaged in a finger-painting activity designed to promote sensory exploration and free expression. Creativity levels were assessed using a validated instrument before and after the intervention to measure changes in performance.

### Instrument Testing

Before data collection, the creativity instrument was validated by an early childhood education expert, Setiorini Rahma Safitri, M.Pd., and field-tested with 34 respondents. All ten indicators were aligned with the national *Standar Tingkat Pencapaian Perkembangan Anak* (STPPA), demonstrating strong validity and reliability ($r_{count} = 0.354–0.817$; $\alpha = 0.745–0.757$). These results confirmed that

**Table 1**. Validity and reliability of research instruments.

| Variable | N of Items | r_table | r_count Range | Cronbach's α | Remark |
|---|---|---|---|---|---|
| Finger Painting (X) | 10 | 0.339 | 0.354–0.817 | 0.745 | Valid & Reliable |
| Creativity (Y) | 10 | 0.339 | 0.376–0.788 | 0.757 | Valid & Reliable |

**Note:** All items met the minimum validity coefficient ($r_{count} > r_{table} = 0.339$) and reliability threshold ($\alpha > 0.60$), indicating that the instruments were appropriate for further data collection.

**Table 2**. Descriptive statistics of pretest and post-test scores.

| Variable | N | Mean | SD | Std. Error Mean |
|---|---|---|---|---|
| **Pretest** | 17 | 69.47 | 3.448 | 0.836 |
| **Posttest** | 17 | 76.76 | 2.251 | 0.546 |

**Table 3**. Paired samples T-test results.

| Pair | Mean Difference | SD | SE Mean | 95% CI (Lower–Upper) | t | df | Sig. (2-tailed) | Cohen's d |
|---|---|---|---|---|---|---|---|---|
| **Pre–Post** | -7.29 | 3.70 | 0.90 | -9.20 – -5.39 | -8.12 | 16 | 0.000 | 1.97 |

the instruments were psychometrically sound and suitable for formal data collection (see **Table 1**).

### Pretest and Posttest Analysis

Descriptive statistics (**Table 2**) show an increase in mean creativity scores from 69.47 (SD = 3.45) in the pretest to 76.76 (SD = 2.25) in the posttest. Most children shifted from the "Developing" (MB) to "Very Well Developed" (BSB) category, suggesting a marked improvement in creative expression following the intervention. Mean posttest scores were higher than pretest scores, reflecting improvement in children's creative abilities following the finger painting intervention.

#### Normality and Homogeneity Tests

The Shapiro–Wilk test was used to evaluate data normality. The pretest score yielded $p = 0.084$, and the posttest score $p = 0.244$ (both > 0.05), confirming that the data were normally distributed. Levene's test for equality of variances returned a value of $p = 0.129$ (> 0.05), indicating homogeneous variance between groups. These results satisfied the assumptions required for parametric testing.

#### Paired Sample T-Test

The paired samples t-test was performed to determine whether a statistically significant difference existed between pretest and posttest scores. The analysis results are summarized in **Table 3**.

The test yielded a *p-value of 0.000 (< 0.05)*, indicating a statistically significant difference between pretest and posttest scores. The effect size (*Cohen's d = 1.97*) suggests a large practical effect, reflecting substantial improvement in measured creativity after the intervention.

The quantitative analysis confirmed that all statistical assumptions were met and that the observed differences in mean creativity scores were statistically significant with a large effect size. These results provide empirical evidence supporting the effectiveness of the experimental method compared to the conventional approach.

Further interpretation of these findings and their implications for early childhood art education are presented in the *Discussion* section.

## Discussion

This study aimed to assess the effectiveness of the finger painting method in enhancing coloring creativity among children aged 5–6 years at TK Islam Al-Husna, Salatiga. Using a quasi-experimental design with non-equivalent control and experimental groups, the findings demonstrated a statistically significant improvement in the creative performance of children exposed to finger painting activities compared to those engaged in conventional coloring methods. The experimental group achieved a mean posttest score of 3.64, categorized as *Very Well Developed*, whereas the control group's mean score of 2.17 reflected a *Developing* level of creativity.

From a sociocultural and constructivist perspective, these results affirm that creativity develops through interaction, exploration, and sensory engagement rather than through teacher-directed instruction (15). Finger painting provides a meaningful context for such learning because it invites children to express themselves through tactile exploration, social collaboration, and imaginative experimentation. This aligns with Vygotsky's view that creativity in early childhood emerges within the *zone of proximal development*, where adult facilitation supports but does not constrain a child's self-expression (16). The sensory and kinesthetic nature of finger painting also reflects constructivist principles that position children as active meaning-makers who learn through experience and reflection (17).

Beyond statistical improvements, the findings demonstrate why finger painting serves as an effective pedagogical strategy for fostering creativity. The activity engages multiple senses, touch, sight, and movement, allowing children to explore textures and colors freely while building fine motor coordination and hand–eye control, both critical for artistic and cognitive growth (18). Moreover, finger painting encourages emotional expression and risk-taking, providing a psychologically safe space where children can create without fear of making mistakes. Such open-ended engagement nurtures intrinsic motivation and creative confidence, outcomes that have been similarly observed in studies by Jalongo and Gerbracht (19) and Kemple *et al*. (20), who found that process-oriented art experiences promote both cognitive flexibility and emotional regulation in preschool learners.

These findings are consistent with previous research emphasizing the role of sensory-based learning in enhancing imagination, divergent thinking, and problem-solving among young children (21, 22). In particular, the tactile and exploratory features of finger painting appear to stimulate neural pathways associated with creativity and executive functioning (23). Studies in diverse contexts, including China, Finland, and Malaysia, have also reported that integrating art-based experiential learning into early education supports children's social interaction, cultural awareness, and emotional well-being (24). This suggests that finger painting may hold universal pedagogical value, even when adapted to culturally distinct educational environments like Indonesia's.

However, several limitations should be acknowledged. The small sample size (n = 34) and single-site design restrict the generalizability of the findings. The short duration of the intervention also prevents conclusions about long-term impacts on creativity development. Furthermore, contextual variables such as teacher facilitation style, classroom environment, and children's prior exposure to art-based activities may have influenced outcomes. Future research could adopt mixed-method approaches to capture qualitative dimensions of children's creative processes, such as emotional engagement and peer interaction, through direct observation or interviews, thereby deepening the interpretive analysis (25). Although this study did not include direct qualitative excerpts from classroom observations, future research could incorporate children's verbal expressions or teachers' reflections to illustrate the creative processes observed.

Despite these limitations, the study contributes meaningful insights for early childhood education in Indonesia. The integration of finger painting aligns with the *Merdeka Belajar* curriculum, which promotes experiential, student-centered learning and views creativity as a cornerstone of holistic development (26). It also resonates with the STEAM (Science, Technology, Engineering, Arts, and Mathematics) framework, emphasizing creativity and innovation as essential 21st-century skills (27). By incorporating sensory-based art experiences like finger painting, educators can foster not only artistic expression but also critical thinking, collaboration, and curiosity, attributes essential for lifelong learning.

In conclusion, this study reinforces that finger painting is not merely an art activity but a culturally adaptable, constructivist approach to learning that integrates sensory, emotional, and cognitive domains of development. When systematically implemented, such practices can nurture creative, confident, and independent learners who are better prepared for the complex demands of modern education and society.

## Conclusion

This study provides quasi-experimental evidence that the finger painting method effectively enhances coloring creativity among children aged 5–6 years in an Indonesian early childhood education setting. Children in the experimental group demonstrated significantly higher posttest scores and developmental levels than those in the control group, confirming that sensory-based, exploratory learning fosters creative expression more effectively than conventional approaches.

Beyond confirming previous theoretical claims about constructivist and sociocultural learning, these findings contribute to the broader discourse on how culturally responsive, experiential art education can bridge global theories of creativity with local pedagogical realities. In particular, this study extends existing research dominated by Western and East Asian contexts by offering empirical validation from an Indonesian setting, where structured, teacher-centered learning remains prevalent.

Practically, the findings underscore the importance of integrating tactile and process-oriented art activities, such as finger painting, into the national *Merdeka Belajar* curriculum. Such approaches not only nurture creativity and fine motor skills but also foster autonomy, emotional expression, and cognitive flexibility, competencies that align with 21st-century learning goals.

Future research should expand this inquiry through multi-site or cross-cultural comparisons and longitudinal designs to explore how sustained engagement with sensory-rich art experiences shapes children's creative and socio-emotional development over time.

## Declarations

### Author Informations

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*Contribution:* Data Curation, Formal analysis, Visualization, Writing - Original Draft, Writing - Review & Editing.

### Conflict of Interest

The author declares no conflicting interest.

### Data Availability

The unpublished data is available upon request to the corresponding author.

### Ethics Statement

Not applicable.

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# Additional Information

## How to Cite

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