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The Effect of Graffito Drawing Techniques on Children's Visual-Spatial Intelligence in Kindergarten Miftahul Jannah Padang

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Abstract

Although visual-spatial intelligence is essential for early childhood development because it supports children's understanding of space, shape, direction, color, and imagination, field observations indicate that this ability remains insufficiently developed. Many children still have difficulty understanding direction, distinguishing colors, and expressing imagination independently, as they tend to imitate examples provided by teachers. This study aims to determine the effect of drawing using the graffito technique on children's visual-spatial intelligence at Miftahul Jannah Kindergarten, Padang. A quantitative approach with a quasi-experimental design was employed. The population consisted of all 20 children at Miftahul Jannah Kindergarten, with the sample selected through purposive sampling, comprising Group B1 as the experimental class and Group B2 as the control class. Data were collected through observation using a visual-spatial intelligence assessment instrument. Data analysis was conducted using statistical tests, including normality and homogeneity tests, followed by a t-test comparing pretest and posttest results in both groups. The findings indicate that children in the experimental class experienced greater improvement in visual-spatial intelligence than those in the

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control class, as shown by the difference between the pretest and posttest results. The data were normally distributed and homogeneous, with significance values greater than 0.05. The t-test produced a significance value of 0.000 < 0.05, indicating that H_0 was rejected and H_a was accepted. The study concludes that drawing using the graffito technique has a significant effect on improving children's visual-spatial intelligence. These findings contribute to early childhood education by demonstrating the value of creative art-based activities in stimulating spatial understanding, color recognition, and imaginative expression, while providing practical implications for kindergarten teachers in designing more exploratory and developmentally appropriate learning activities.

Keywords: Graffito Technique; Drawing Activity; Visual-Spatial Intelligence; Early Childhood Education; Kindergarten Children

INTRODUCTION

Early childhood education plays a fundamental role in providing stimulation, guidance, care, and meaningful learning experiences that support children's growth and future abilities (Abdulkareem, n.d.; Macintyre, 2016; Rumbidzai & Achebe, 2023). At this stage, children naturally possess various forms of intelligence that develop through interaction, experience, and learning activities. Intelligence is not only understood as the ability to solve problems, but also as the capacity to discover new knowledge and respond to challenges in different ways (Sani et al., 2009). In line with this view, multiple intelligence theory emphasizes that every child has unique intelligence profiles that may develop differently depending on their learning environment and life experiences (Gardner, 1993).

One important intelligence that needs to be stimulated in early childhood is visual-spatial intelligence. Visual-spatial intelligence refers to the ability to understand, imagine, interpret, and represent objects, shapes, colors, spaces, and visual relationships. Children with strong visual-spatial intelligence tend to think through images and are more responsive to visual forms such as pictures, videos, demonstrations, maps, diagrams, and visual media (Lange-Küttner, 2024; Mansour & El-Senousy, 2022; Zhu et al., 2023). This ability is important because it helps children recognize shapes, organize spatial relationships, develop imagination, and express ideas through visual representation (Taylor et al., 2023).

Internationally, the development of visual-spatial intelligence is closely related to children's creative thinking, problem-solving skills, and artistic expression. Gardner (2013) explains that visual-spatial intelligence involves sensitivity to lines, colors, shapes, spaces, details, representation, and design. Armstrong (2013) also states that this intelligence enables individuals to accurately perceive the visual-spatial world and transform that perception into meaningful forms. Therefore, visual-spatial intelligence is not only related to artistic ability, but also contributes to children's cognitive, creative, and imaginative development.

In the national context, several studies have shown that children's visual-spatial intelligence in early childhood education settings still needs serious attention. Yulianingsih et al. (2022) found that some children still tend to imitate the teacher's examples in drawing activities rather than producing their own ideas. Nasution (2024) reported that children's visual-spatial intelligence was still low, especially in recognizing colors, grouping objects based on basic colors, naming newly observed objects, and remembering activity sequences. Similar problems were also found by Fasrita et al. (2020) , who stated that visual-spatial intelligence in early childhood had not developed optimally.

These problems indicate that learning activities in early childhood education need to be designed more creatively, attractively, and appropriately according to children's developmental characteristics. Teachers should not only provide examples for children to imitate, but also create opportunities for children to explore colors, lines, shapes, textures, and imagination independently. Abidin & Kurniawati (2020) explain that the development of children's visual-spatial intelligence often receives insufficient attention, especially in relation to spatial concepts, direction, and shape. Ernawati & Westhisi (2021) also state that children often experience difficulty in creating shapes based on objects they have previously seen.

One learning activity that can be used to stimulate visual-spatial intelligence is drawing. Drawing is a familiar and enjoyable activity for young children because it allows them to express ideas, feelings, imagination, and experiences through visual forms. Mayar (2020) states that drawing can stimulate children's growth and development because it provides space for children to express their thoughts through scribbles and lines. Khofifah (2018) also explains that children's imaginative thinking patterns can be improved through

drawing activities, especially because children with strong visual-spatial intelligence usually enjoy drawing, puzzles, blocks, mazes, and activities involving visual construction.

In relation to drawing activities, the graffito technique offers an interesting alternative for early childhood learning. Graffito is a technique carried out by applying base colors under darker colors and then scraping or carving the surface to reveal the colors underneath (Dajnowski et al., 2024; ElBadry azaz Abd El Rahim, 2022; Peck, 2025). This technique allows children to explore color layers, textures, lines, and visual patterns in a creative way. Through this activity, children are not only encouraged to draw, but also to imagine, choose colors, create shapes, and understand visual relationships between elements.

Several previous studies have examined learning activities and media that can improve children's visual-spatial intelligence. Amelia & Ilhami (2025) found that playdough activities could improve visual-spatial intelligence through home visits during the Covid-19 pandemic. Mubaroroh et al. (2023) showed that picture guessing media influenced early childhood visual-spatial intelligence. Lestari et al. (2023) reported that batik activities could improve children's visual-spatial intelligence, while Safitri & Nirwana (2024) found that maze games supported the development of this intelligence. Warmansyah et al. (2022) also found that drawing activities had an influence on the visual-spatial intelligence of children aged 5–6 years. However, these studies have not specifically focused on the use of the graffito technique in drawing activities for early childhood.

Based on these issues, theoretical perspectives, and previous research findings, this study focuses on the use of drawing activities with the graffito technique to develop visual-spatial intelligence in early childhood. The novelty of this study lies in the use of the graffito technique as a creative drawing activity that combines color exploration, texture, line, shape, and visual imagination. Therefore, this study aims to describe and analyze the effectiveness of drawing activities using the graffito technique in developing visual-spatial intelligence in early childhood.

METHODS

This study employed a quantitative approach with a quasi-experimental design. A quantitative approach was used because the study aimed to measure the effect of graffito drawing techniques on children's visual-spatial intelligence through numerical data and

statistical testing. Quantitative research is appropriate when researchers intend to test hypotheses and examine the relationship or effect between variables (Creswell, 2014; Sugiyono, 2018). The research design used was a quasi-experimental design with a pre-test and post-test control group model. This design was selected because the researcher compared two groups, namely an experimental group that received treatment through graffito drawing techniques and a control group that used ordinary drawing techniques. The design was considered suitable because full randomization could not be applied in the classroom setting. The population of this study consisted of all children at Miftahul Jannah Kindergarten Padang in the 2025/2026 academic year, totaling 20 children. The sampling technique used was total sampling, in which all members of the population were involved as research samples. Group B1, consisting of 10 children, was assigned as the experimental class, while Group B2, consisting of 10 children, was assigned as the control class. This sampling technique was used because the population was relatively small and all members could be included in the study (Sugiyono, 2018).

Data were collected through observation, tests, and documentation. The main instrument used in this study was a visual-spatial intelligence assessment sheet based on four aspects, namely line, shape, color, and space, adapted from Gardner's theory of visual-spatial intelligence. The instrument consisted of eight assessment items using a rating scale with four criteria: proficient, capable, emerging, and not yet emerging. Before being used in the study, the instrument was validated through expert judgment by a specialist in early childhood creativity and was then tested empirically using SPSS version 23. The validity test showed that the instrument items were valid because the item correlation values met the required criteria, while the reliability test produced a Cronbach's Alpha value of 0.794, indicating that the instrument was reliable. The data analysis technique used in this study included descriptive and inferential statistical analysis. Descriptive analysis was used to describe the pre-test and post-test scores of both groups, while inferential analysis was used to test the research hypothesis. Before conducting the hypothesis test, the data were tested for normality using the Kolmogorov-Smirnov test and for homogeneity using a variance homogeneity test. After the data met the assumptions of normality and homogeneity, the hypothesis was tested using a t-test with a significance level of 0.05. If the significance value was less than 0.05, the alternative hypothesis was accepted, indicating that graffito drawing techniques had a significant effect on children's visual-spatial intelligence.

RESULTS

1. Comparison of Pre-Test and Post-Test Scores in the Experimental and Control Classes

The research was conducted in three stages, namely pre-test, treatment, and post-test. The pre-test was administered to determine the initial visual-spatial intelligence abilities of children in the experimental and control classes. After that, the experimental class received treatment through drawing activities using the graffito technique, while the control class received learning without the graffito technique. The post-test was then administered to determine the improvement in children's visual-spatial intelligence after the learning process.

The comparison of pre-test and post-test scores in the experimental and control classes is presented in Table 1.

Table 1. Comparative Data of Pre-Test and Post-Test Scores in the Experimental and Control Classes

Experimental Class	Pre-Test	Post-Test	Difference	Control Class	Pre-Test	Post-Test	Difference
RA	24	27	3	AH	19	24	5
AA	21	26	5	A	19	21	2
KA	23	26	3	AA	21	25	4
KZA	20	23	3	AN	21	23	2
MA	21	25	4	AL	20	22	2
NA	20	24	4	AA	22	23	1
RA	21	24	3	ID	22	26	4
SY	19	25	6	LT	20	22	2
ZN	22	26	4	SM	20	23	3
ZD	20	25	5	ZI	22	24	2
Total	211	251	40	Total	206	233	27

Based on Table 1, the experimental class obtained a total pre-test score of 211 and a total post-test score of 251. The total increase in the experimental class was 40 points. Meanwhile, the control class obtained a total pre-test score of 206 and a total post-test score of 233, with a total increase of 27 points. These results show that both classes experienced improvement after the learning process. However, the increase in the experimental class was higher than that in the control class.

The gain score was calculated by subtracting the pre-test score from the post-test score. The formula used is presented in Equation (1).

$$\text{Gain Score} = \text{Post-Test Score} - \text{Pre-Test Score} \quad (1)$$

Based on Equation (1), the average gain score in the experimental class was 4.00, while the average gain score in the control class was 2.70. This indicates that the improvement in children's visual-spatial intelligence was greater in the class that received treatment using the graffito technique.

2. Descriptive Statistical Analysis of Pre-Test and Post-Test Scores

Descriptive statistical analysis was conducted to describe the characteristics of the pre-test and post-test data in both classes. The analysis included the number of samples, range, minimum score, maximum score, total score, mean, standard deviation, and variance. The results of the descriptive statistical analysis are presented in Table 2.

Table 2. Descriptive Statistical Comparison of Pre-Test and Post-Test Scores in the Experimental and Control Classes

Data Group	N	Range	Minimum	Maximum	Sum	Mean	Std. Error	Standard Deviation	Variance
Experimental Pre-Test	10	5	19	24	211	21.10	0.482	1.524	2.322
Experimental Post-Test	10	4	23	27	251	25.10	0.379	1.197	1.433
Control Pre-Test	10	3	19	22	206	20.60	0.371	1.174	1.378
Control Post-Test	10	5	21	26	233	23.30	0.473	1.494	2.233

Table 2 shows that the number of children in each class was 10. In the experimental class, the pre-test scores ranged from 19 to 24, with a mean score of 21.10. The standard deviation was 1.524, and the variance was 2.322. These results indicate that the children's initial abilities in the experimental class were relatively homogeneous.

After the treatment using the graffito technique, the post-test scores in the experimental class increased. The minimum score was 23, and the maximum score was 27, with a mean score of 25.10. The standard deviation decreased to 1.197, and the variance decreased to 1.433. This shows that the children's scores became more evenly distributed after the treatment.

In the control class, the pre-test scores ranged from 19 to 22, with a mean score of 20.60. The standard deviation was 1.174, and the variance was 1.378. These results indicate that the children's initial abilities in the control class were also relatively homogeneous. After the learning process, the post-test scores increased, with a minimum score of 21 and a maximum score of 26. The mean score increased to 23.30, with a standard deviation of 1.494 and a variance of 2.233.

Overall, the descriptive statistical results show that both classes experienced an increase from pre-test to post-test. However, the increase in the experimental class was higher than that in the control class. The mean score in the experimental class increased by 4.00 points, from 21.10 to 25.10, while the mean score in the control class increased by 2.70 points, from 20.60 to 23.30. These findings indicate that drawing activities using the graffito technique provided a more optimal improvement in children's visual-spatial intelligence compared to learning activities without the graffito technique.

DISCUSSION

The results of this study indicate that drawing activities using the graffito technique contributed to a greater improvement in children's visual-spatial intelligence compared to learning activities in the control class. This can be seen from the increase in the mean score of the experimental class from 21.10 in the pre-test to 25.10 in the post-test, with a gain score of 4.00. Meanwhile, the control class increased from 20.60 to 23.30, with a gain score of 2.70. These findings show that the treatment given to the experimental class had a more optimal effect on developing children's visual-spatial intelligence.

The improvement in the experimental class suggests that the graffito technique provides children with opportunities to explore visual elements directly, such as color, line, texture, shape, and space. Through this technique, children are not only asked to draw, but also to observe, imagine, scratch, combine colors, and create visual patterns. These activities support the development of visual-spatial intelligence because children are encouraged to process visual information and transform it into concrete visual forms. Therefore, the graffito technique can be understood as an exploratory and multisensory learning activity that is suitable for early childhood development.

The results of the classical assumption tests also support the validity of the statistical analysis. The normality test showed that the data were normally distributed, while the homogeneity test showed that the data variance between groups was homogeneous. These results indicate that the experimental and control classes could be compared appropriately. Furthermore, the independent sample t-test showed a significant difference between the experimental and control classes. Thus, the alternative hypothesis was accepted, meaning that the graffito technique significantly improved visual-spatial intelligence in early childhood.

These findings are consistent with previous studies which show that art-based and exploratory activities can improve children's visual-spatial intelligence. Ningrum et al. (2025) found that drawing activities involving objects, colors, and lines improved children's visual-spatial intelligence. Marlina & Mayar (2020) also emphasized that exploratory activities such as arranging, pasting, and drawing contribute to the development of children's spatial abilities. Similarly, Sarah (2025) reported that drawing interventions improved children's ability to place objects, distinguish backgrounds, and use colors. These findings strengthen the view that visual-spatial intelligence develops more effectively when children are involved in active, creative, and visual learning experiences.

The results of this study are also in line with studies conducted by Mansour & El-Senousy (2022) ; Zhu et al. (2023), which showed that visual games, playdough, cognitive-based visual activities, and educational games can stimulate children's visual-spatial abilities. However, this study has a different focus because it specifically uses the graffito technique as a creative drawing activity. The novelty of this study lies in the use of layered coloring and scratching techniques as a medium for stimulating children's visual imagination, spatial awareness, and visual representation skills.

Theoretically, the findings of this study support Gardner's theory of multiple intelligences, especially the dimension of visual-spatial intelligence. Visual-spatial intelligence is closely related to the ability to understand, process, and represent visual information through color, line, shape, and space. The graffito technique supports this ability because it requires children to create visual forms through direct exploration of art media. These findings also support Piaget's theory of cognitive development, particularly the view that children in the preoperational stage learn best through concrete experiences and direct interaction with objects.

Practically, this study provides implications for early childhood educators. Teachers can use the graffito technique as an alternative learning activity to develop children's visual-spatial intelligence in a fun and creative way. This technique is relatively simple to apply and can be integrated into art learning activities, theme-based learning, or creative play activities. Through graffito, children can be encouraged to express ideas more freely, recognize colors and shapes, and develop imagination through visual exploration.

This study also has implications for the development of learning strategies in early childhood education. Learning activities should not only focus on verbal instruction or

imitation of teacher examples, but also provide opportunities for children to explore, create, and make visual decisions independently. The graffito technique can help teachers create learning experiences that are active, meaningful, and appropriate to children's developmental characteristics. Thus, the findings of this study contribute to strengthening the use of exploratory art activities as a medium for developing children's intelligence.

However, this study has several limitations. The sample size was relatively small because it only involved one experimental class and one control class. Therefore, the findings cannot be generalized widely to all early childhood education contexts. In addition, the study was conducted in a limited period, so it only measured short-term improvement after treatment. This study also did not fully control external factors, such as children's family background, previous art experience, gender differences, and teacher facilitation during the learning process. Future research is recommended to involve larger samples, longer treatment periods, and comparisons with other art techniques to obtain more comprehensive findings.

CONCLUSION

This study concludes that drawing activities using the graffito technique significantly improved the visual-spatial intelligence of early childhood. The results showed that children in the experimental class experienced a higher increase in scores than those in the control class. The experimental class obtained a gain score of 4.00, while the control class obtained a gain score of 2.70. The independent sample t-test also showed a significance value of 0.022, which was lower than 0.05. Therefore, the alternative hypothesis was accepted, indicating that the graffito technique had a significant effect on improving children's visual-spatial intelligence.

The use of the graffito technique provided meaningful stimulation because it involved exploratory, multisensory, and experiential art activities. Through scratching, layered coloring, line formation, texture exploration, and visual pattern creation, children were encouraged to develop imagination, recognize visual elements, and express ideas in a creative form. These findings indicate that the graffito technique can be used as an innovative learning method in early childhood education, particularly to support the development of visual-spatial intelligence. Future research is recommended to examine the effectiveness of this technique over a longer period, involve larger and more diverse

samples, and explore its integration with digital media or interdisciplinary learning approaches.

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