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The Effect of Painting Activities Using Water Hyacinth Fiber Media on Learning Interest and Creativity of Fifth-Grade Students at SD Negeri Wonosari Baru Cluster 2 Kapanewon Wonosari

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ABSTRACT

This study examined the effect of painting activities using water hyacinth fiber as a natural medium on learning interest and creativity of fifth-grade elementary school students in visual arts. A quasi-experimental design with a nonequivalent control group was conducted at SD Negeri Wonosari Baru, involving an experimental class of 28 students and a control class of 27 students. Data were collected through validated and reliable questionnaires measuring learning interest and creativity, with reliability coefficients of 0.841 and 0.950. Data analysis employed independent sample t-tests, paired sample t-tests, and MANOVA. The results indicate that painting activities using water hyacinth fiber significantly improved students' learning interest and creativity. MANOVA analysis showed a strong overall effect, with a Wilks' Lambda value of 0.192 and a Partial Eta Squared of 0.808 ($p < 0.001$). Univariate tests revealed significant effects on learning interest ($p = 0.001$, $\eta^2 = 0.194$) and creativity ($p = 0.000$, $\eta^2 = 0.780$). These findings highlight the impact of integrating local and environmentally friendly materials into art instruction. The use of water hyacinth fiber provides meaningful learning experiences that enhance engagement and creative expression in elementary visual arts education.

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1. INTRODUCTION

Primary education is a crucial foundation in shaping students' character and potential holistically. Education's role is not limited to delivering knowledge but also encompasses personal development and character building. Quality education will produce superior and competitive human resources. Therefore, the primary education system needs to be designed to encourage active, creative, and meaningful learning from an early age. Education must also be able to address the challenges of the times, such as the application of active and meaningful learning through a contextual approach in line with the Merdeka Curriculum. Thus, achieving educational goals is not only measured by mastery of the material but also by students' ability to actualize that knowledge in real life (Fajrie & Kurniawan, 2025).

One important indicator of the success of learning in primary school is the presence of high student interest in learning. Interest in learning serves as an internal motivator that encourages students to actively engage in the learning process, enjoy learning activities, and show attention and enthusiasm for the subject matter. Learning can be understood as a series of mental and physical activities aimed at producing behavioral changes as a result of an individual's experience interacting with their environment, which includes cognitive, affective, and psychomotor aspects (Agustin, 2023). Students who show interest in certain subjects tend to pay more attention to those lessons. When someone is interested, they will seek more information about the topic. Interest becomes a key driver in everything, which in turn produces positive impacts for themselves and their surrounding environment (Hamid et al., 2024).

Another important aspect of learning in visual arts is creativity. Creativity is the ability to create something new, both in the fields of art and technology, and to solve problems with innovative approaches (Utami, 2022). Creative students are able to come up with unique solutions, express themselves through visual media, and show courage in experimenting. This creativity needs to be developed from an early age so that students become accustomed to facing challenges and are brave enough to express their ideas independently. Visual arts education in primary school is not only aimed at improving drawing skills but also at developing students' imagination, aesthetics, and self-confidence. Therefore, selecting the right media and teaching approach is a crucial factor in supporting the achievement of visual arts learning objectives (Zakaria et al., 2025).

In the context of the Merdeka Curriculum, visual arts education is expected to go beyond the development of technical skills and support diverse forms of student expression through contextual and environment-based learning approaches (Ahmad & Julia, 2022). However, in practice, visual arts instruction in primary schools remains largely dependent on conventional media, such as drawing paper and colored pencils. This limited variation often results in monotonous learning experiences that do not sufficiently stimulate students' learning interest or creativity. Previous studies have highlighted that minimal use of varied and contextual learning media can hinder the optimal development of students' creative potential (Atira et al., 2021).

Although existing research emphasizes the importance of engaging and interactive learning media in supporting effective learning Utami (2022), most studies focus on general media innovation without specifically examining the use of locally available natural materials in visual arts education at the elementary level. This indicates a research gap regarding empirical evidence on how environment-based natural media can influence both learning interest and creativity simultaneously within the framework of the Merdeka Curriculum.

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The novelty of this study lies in its use of water hyacinth fiber as an alternative natural painting medium and its examination of its dual impact on students' learning interest and creativity through an experimental approach. By integrating local environmental resources into visual arts learning, this study offers a sustainable and contextually relevant instructional model that has not been sufficiently explored in previous research.

This study aims to examine the utilization of environment-based media, specifically water hyacinth natural fibers, in enhancing students' interest in learning and creativity in visual arts education at the primary school level. Water hyacinth, with its unique texture and natural properties, can serve as an effective medium in stimulating students' creativity and encouraging richer visual exploration. The use of this media is expected to not only enhance students' interest and creativity but also bring them closer to their surrounding reality while teaching environmental awareness values (Atira et al., 2021). Therefore, this research will explore how the use of water hyacinth natural fiber media can have a positive impact on visual arts education in primary schools, while offering an innovative, contextual alternative based on local potential. This study is expected to contribute to the development of a more creative, contextual, and environment-based visual arts learning model and offer new insights into the use of alternative media to enhance the quality of primary school visual arts education.

2. METHODS

This study adopts a quantitative approach with a quasi-experimental design, specifically the nonequivalent control group design, to measure the effect of painting activities using water hyacinth natural fiber media on the learning interest and creativity of fifth-grade students at SD Negeri Wonosari Baru, Cluster 2, Wonosari District. According to Sugiyono, (2022), the quantitative method in the experimental context aims to identify the effect of an independent variable (treatment) on a dependent variable (outcome) in a controlled situation. The Quasi-Experimental Design was chosen because it suits real-world conditions where full randomization of the research subjects is not possible. In this study, subjects are selected using purposive random sampling, which involves setting specific criteria relevant to the research objectives.

The population in this study includes 191 students enrolled in seven schools in Cluster 2, Wonosari District. The research sample is taken from two parallel classes at SD Negeri Wonosari Baru, namely class VA with 28 students as the experimental group, and class VB with 27 students as the control group. Sample selection is based on criteria that ensure both groups have similar characteristics to ensure equivalence before the treatment is applied.

This study uses the Nonequivalent Control Group Design to determine the effect of painting activities with water hyacinth natural fiber media on students' learning interest and creativity. The experimental group will receive treatment in the form of painting activities using water hyacinth natural fiber media, while the control group will follow regular visual arts lessons without specific intervention. The study will be conducted in three main phases: pretest, intervention, and posttest.

The independent variable in this study is the painting activity using water hyacinth natural fiber media, while the dependent variables are students' learning interest and creativity. The effect of the independent variable on the dependent variables will be analyzed using data collected from pretests and posttests.

Data collection will use several instruments, including questionnaires to measure students' learning interest and creativity, as well as art work tests assessed using a visual-based observation rubric such as originality, aesthetics, and technique. The collected data will be

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analyzed using descriptive and inferential statistical analysis, as well as observations to assess students' participation and involvement in the painting activities.

Data analysis will be carried out using normality tests, homogeneity tests, t-tests, and hypothesis tests to determine significant differences between the experimental and control groups. The tests will be conducted at a significance level of 0.05 to ensure that the results obtained are valid and not due to chance.

Research Hypotheses:

1. Null Hypothesis (H_0) for Learning Interest: There is no significant effect of painting activities using water hyacinth media on the learning interest of fifth-grade students.
2. Alternative Hypothesis (H_a) for Learning Interest: There is a significant effect of painting activities using water hyacinth media on the learning interest of fifth-grade students.
3. Null Hypothesis (H_0) for Creativity: There is no significant effect of painting activities using water hyacinth media on the creativity of fifth-grade students.
4. Alternative Hypothesis (H_a) for Creativity: There is a significant effect of painting activities using water hyacinth media on the creativity of fifth-grade students.
5. Null Hypothesis (H_0) for Learning Interest and Creativity Together: There is no significant effect of painting activities using water hyacinth media on both learning interest and creativity simultaneously.

Alternative Hypothesis (H_a) for Learning Interest and Creativity Together: There is a significant effect of painting activities using water hyacinth media on both learning interest and creativity simultaneously.

3. RESULTS AND DISCUSSION

3.1 Result

This study began with an initial observation to ensure that the implementation of painting activities using water hyacinth natural fiber media was consistent with the planned intervention. The observation results provided a contextual overview of the learning process, including the execution of activities and the level of student involvement, as summarized in **Table 1**.

The painting activities using water hyacinth natural fiber media were conducted over 8 weeks in the experimental group, class VA (27 students), with each session lasting 3 hours, while the control group, class VB (28 students), continued with regular visual arts lessons. The experimental group demonstrated high enthusiasm, reflected in an attendance rate of 97.77%, as illustrated in **Figure 1**, and produced a total of 112 artworks, with each student completing four pieces. In comparison, the control group produced 108 artworks as shown in **Table 1**.

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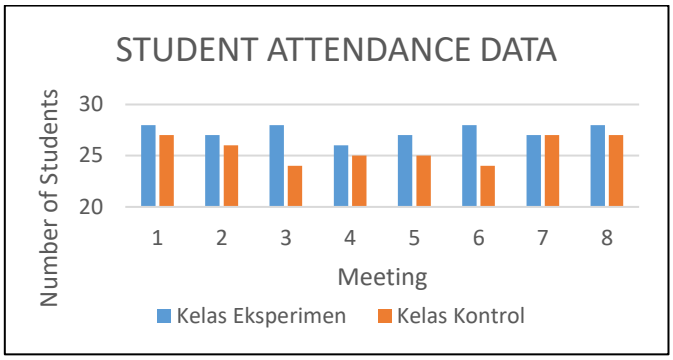


Figure 1. Student attendance diagram

Table 1. Observation results of meeting activities

Meeting	Type of Learning Activity	Engagement Level	Quality of Artwork Characteristics	Development Notes
2	Completing the balance drawing on paper	Moderate	Symmetrical composition; limited use of colors	Students began to understand the concept of visual balance
3-4	Drawing landscapes on water hyacinth media	Fairly high	Water hyacinth texture started to be explored; color variation appeared	Students showed developing curiosity
5-6	Free expressive drawing on water hyacinth	High	Diverse ideas; freer space and color usage	Students demonstrated individuality in their works
7	Free expressive drawing and showcasing artwork	Very high	More personal works, improved detail, more original expression	Creativity peaked, students eagerly presented their work

Qualitative observations further revealed a gradual increase in the diversity of artwork themes in the experimental group throughout the intervention period. In the first session, landscape-themed artworks dominated (46%), followed by abstract (36%) and animation themes (11%). However, during sessions two through four, the variation of themes increased, with students producing artworks depicting plants, animals, and wayang (puppet) themes, as documented in Table 1. This shift in thematic distribution indicates greater freedom of expression facilitated by the use of unconventional media. In contrast, the control group consistently produced artworks dominated by landscape themes (93% and 89%), with minimal variation across sessions, as shown in **Figure 2**.

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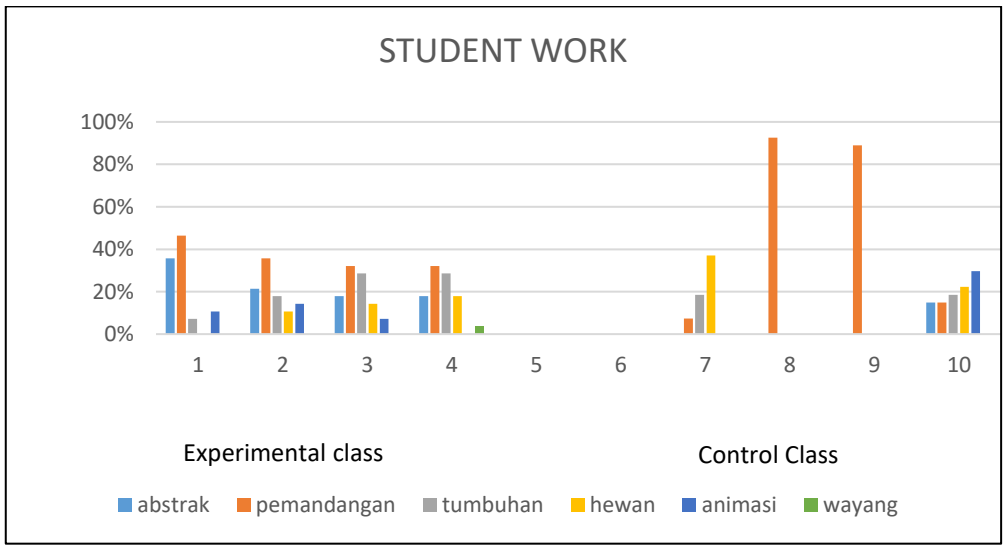


Figure 2. Student artwork results diagram

The observational data indicate that students in the experimental group were highly engaged, actively participating in color selection, composition arrangement, and artwork discussions, while the control group showed limited thematic exploration. These findings support Self-Determination Theory proposed by Deci and Ryan (1985), which suggests that student engagement increases when learning activities provide autonomy, relevance, and opportunities for personal expression. In conclusion, the use of water hyacinth natural fiber media effectively enhanced students' creative diversity, learning interest, and engagement in painting activities.

3.2 Prerequisite Testing

The data analysis process in this study began with a series of statistical prerequisite tests aimed at ensuring that the data met the basic assumptions before being used in inferential analysis. Additionally, the prerequisite tests were conducted to ensure the validity and reliability of the instruments used in measuring the research constructs.

The prerequisites tested included construct validity and instrument reliability, to ensure that the items in the instrument consistently measured the intended aspects. Following this, normality testing and homogeneity of variance testing were conducted as essential assumptions for selecting an appropriate analysis approach, either parametric or nonparametric. The results of these prerequisite tests formed the basis for choosing the hypothesis testing method to be used in the subsequent phase. The results of the data tests conducted are as follows:

1) Validity Test

The validity test aims to assess how well the items in the instrument measure the intended variable construct accurately. This test was performed using Pearson's Product Moment correlation technique, and the results were compared with the r_table value of 0.361 at a 5% significance level with a sample size of 30 respondents.

2) Learning Interest Instrument Validity

Based on the results of the testing presented in Table 2, of the total items tested, 14 items from the learning interest instrument (Y1) showed a calculated r value greater than the r_table value (r > 0.361). Thus, all items used in the main data collection were declared valid.

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These items showed correlation values ranging from the lowest at 0.376 to the highest at 0.740. This indicates that each item in the learning interest instrument has adequately represented the variable construct with sufficient association strength.

Table 2. Learning interest instrument validity

No.	r_{hitung}	r_{tabel} (5%)	Information
1	0,376	0,361	Valid
2	0,608	0,361	Valid
3	0,740	0,361	Valid
4	0,574	0,361	Valid
5	0,558	0,361	Valid
6	0,590	0,361	Valid
7	0,701	0,361	Valid
8	0,502	0,361	Valid
9	0,680	0,361	Valid
10	0,418	0,361	Valid
11	0,413	0,361	Valid
12	0,490	0,361	Valid
13	0,465	0,361	Valid
14	0,680	0,361	Valid

3) Validity of Student Creativity Instrument

The next test result is the validity test for the 18 items of the student creativity instrument (Y2), as presented in Table 3. All items have a calculated r value greater than 0.361, thus they are considered valid. The highest correlation value recorded was 0.838, while the lowest was 0.604. This variation in correlation values indicates a range of relationship strengths, from moderate to very strong.

Table 3. Validity of student creativity instrument

No	r_{hitung}	r_{tabel} (5%)	Information
1	0,802	0,361	Valid
2	0,777	0,361	Valid
3	0,785	0,361	Valid
4	0,838	0,361	Valid
5	0,701	0,361	Valid
6	0,726	0,361	Valid
7	0,657	0,361	Valid
8	0,762	0,361	Valid
9	0,710	0,361	Valid
10	0,783	0,361	Valid
11	0,676	0,361	Valid
12	0,683	0,361	Valid
13	0,604	0,361	Valid
14	0,808	0,361	Valid
15	0,720	0,361	Valid
16	0,740	0,361	Valid
17	0,652	0,361	Valid
18	0,645	0,361	Valid

From the validity test results for both instruments, it can be concluded that all items used in this study have met the empirical validity requirements and can be used for the main data analysis.

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4) Instrument Reliability Test

The reliability test aims to measure the internal consistency of the instrument, specifically how stable the items in the instrument are in providing consistent results. In this study, the reliability test was conducted using Cronbach's Alpha, with a result of α = 0.841 for the learning interest instrument, which indicates high reliability. This value suggests that the instrument is consistent in measuring the learning interest construct. Additionally, analyzing the quality of individual items is essential to determine which items should be retained or revised. This study supports the use of reliable and valid instruments, in line with the findings of Erika et al. (2024), which emphasize the importance of validity and reliability in the development of research instruments show in **Table 4** and **Table 5**.

Table 4. Learning interest reliability

Reliability Statistics	Cronbach's Alpha	N of Items
	.841	14

Table 5. Creativity reliability

Reliability Statistics	Cronbach's Alpha	N of Items
	.950	18

5) Normality and Homogeneity Tests

The normality test was conducted to evaluate whether the data distribution of each variable met the assumption of normality required for parametric statistical analysis. In this study, data normality was tested using the Shapiro–Wilk method, which is considered appropriate for small sample sizes (fewer than 50 respondents). The results of the normality test, as presented in Table 6, indicate that the Shapiro–Wilk significance value for the control group was 0.651, while the experimental group obtained a significance value of 0.566. Since both values exceed the threshold of 0.05, the data are considered normally distributed. Therefore in **Table 6**, the dataset satisfies the assumptions for further analysis using parametric statistical tests, such as the Independent Samples t-test.

Table 6. Tests normality

Variable	Kolmogorov–Smirnov Statistic	df	Sig.	Shapiro–Wilk Statistic	df	Sig.
Control_Interest	0.124	27	0.200*	0.972	27	0.651
Experimental_Interest	0.099	27	0.200*	0.969	27	0.566
Control_Creativity	0.172	27	0.040	0.952	27	0.246
Experimental_Creativity	0.128	27	0.200*	0.949	27	0.205

Note: This is a lower bound of the true significance.
a. Lilliefors Significance Correction

6) Normality and Homogeneity Tests

The normality test is used to evaluate the distribution of data for the creativity variable in both the control (N = 27) and experimental (N = 28) groups, using the Shapiro-Wilk method, which is appropriate for small samples. The results showed that the p-values for the control group were 0.246 and for the experimental group were 0.205, both greater than 0.05, indicating that the data are normally distributed. Therefore, the creativity data for both groups can be assumed to follow a normal distribution, allowing the application of parametric tests such as the Independent Samples t-test for mean comparison.

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7) Homogeneity Test

The homogeneity of variance test was conducted to determine whether the data distributions of the control and experimental groups had equal variances, which is a key assumption for parametric statistical analysis. In this study, Levene's Test for Equality of Variances was applied at a 5% significance level (α = 0.05). The results show that the variance of students' learning interest scores in both the control and experimental groups was homogeneous (p = 0.406), as presented in **Table 7**. Since the significance value exceeded 0.05, the assumption of homogeneity was met, allowing further analysis using parametric tests, specifically the Independent Samples t-test.

Table 7. Homogeneity test for learning interest

Variable	Levene's Statistic Sig.	Conclusion
Learning Interest	0.406	Homogeneous

For the creativity variable, the homogeneity test revealed unequal variances (p = 0.003), indicating heterogeneity between the two groups, as shown in **Table 8**. Due to the violation of the homogeneity assumption, a nonparametric statistical approach was required.

Table 8. Homogeneity test for creativity

Variable	Levene's Statistic Sig.	Conclusion
Creativity	0.003	Heterogeneous

The Mann-Whitney U was employed to examine differences in creativity between the experimental and control groups. A summary of the homogeneity test results for both variables is provided in **Table 9**.

Table 9. Homogeneity test results

Variable	Levene's Statistic Sig.	Conclusion
Learning Interest	0.406	Homogeneous
Creativity	0.003	Heterogeneous

The Mann–Whitney U test results indicated a statistically significant difference in creativity between the two groups (p = 0.000), with a large effect size (r = −0.857). These findings support the hypothesis that painting activities using water hyacinth media effectively enhance students' creativity, in line with constructivist theory and experiential learning principles.

8) Descriptive Statistical Analysis

The descriptive analysis shows that the experimental group had a significant improvement in both learning interest and creativity compared to the control group. In terms of learning interest, the experimental group showed an average increase from 44.46 to 46.64, while the control group only showed a slight increase. For creativity, the experimental group increased from 53.93 to 65.61, while the control group barely changed. These findings indicate that the water hyacinth media-based intervention positively affected both variables, but inferential testing is needed to determine the statistical significance of these differences. The next step will involve testing the differences between groups using either parametric or nonparametric tests, depending on the data assumptions.

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9) Initial Equality of Learning Interest

To ensure that the differences observed in posttest results were attributable to the intervention rather than to pre-existing differences between groups, an initial equality test was conducted on the pretest learning interest scores using the Independent Samples t-test. Levene's Test for Equality of Variances yielded a significance value of 0.920 ($p > 0.05$), indicating that the variances between the experimental and control groups were homogeneous; therefore, the analysis was performed under the assumption of equal variances. The results of the pretest comparison are presented in **Table 10**.

Table 10. Hypothesis test results for learning interest

Class	Mean	Std. Deviation	df	Sig. (2-tailed)	Conclusion
Experimental	44.19	4.151	53	0.807	H_o accepted
Control	44.46	4.256	52.992		

As shown in Table 10, the t-test results indicate $t(53) = -0.246$ with a significance value of $p = 0.807$ ($p > 0.05$), demonstrating that there was no statistically significant difference in pretest learning interest between the experimental and control classes. The mean pretest score of the experimental class was 44.19 (SD = 4.151), while the control class obtained a mean score of 44.46 (SD = 4.256), resulting in a negligible difference of 0.279 points. These findings confirm that both groups were equivalent in terms of learning interest prior to the intervention, thereby strengthening the internal validity of the study. Consequently, any differences observed in the posttest can be confidently attributed to the intervention implemented in the experimental class.

10) Initial Equality of Student Creativity

To examine the initial equivalence of student creativity between the control and experimental classes, an Independent Samples t-test was conducted on the pretest creativity scores. The results of this analysis are presented in **Table 11**.

Table 11. Hypothesis test results for student creativity

Class	N	Mean	Std. Deviation	Std. Error Mean	Sig. (2-tailed)	Conclusion
Control	27	53.48	0.643	0.124	0.034	H_o rejected
Experimental	28	53.93	0.858	0.162		

The results show that the average pretest creativity score for the experimental class (M = 53.93) was slightly higher than the control class (M = 53.48), with a mean difference of 0.45 points. Since the significance value (p) is less than 0.05, there is a significant difference between the pretest creativity scores of the experimental and control classes. The mean difference of -0.447 indicates that the experimental class had higher scores.

Changes in Learning Interest for Control and Experimental Classes (Pretest and Posttest)

To analyze changes in students' learning interest in the control class, a Paired Samples t-test was applied to compare pretest and posttest scores. The results are summarized in **Table 12**.

Table 12. Pretest and posttest results for learning interest in control class

Class	N	Mean	Std. Deviation	t	Sig. (2-tailed)	Conclusion
Pretest	27	44.19	4.151	-0.075	0.941	H_o accepted
Posttest	27	44.26	2.194			

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These results there was no statistically significant difference between the pretest (M = 44.19, SD = 4.151) and posttest (M = 44.26, SD = 2.194) scores, with t(26) = −0.075 and p = 0.941 (p > 0.05). This finding indicates that conventional visual arts instruction without specific instructional interventions did not significantly improve students' learning interest, leading to the acceptance of H_o.

11) Changes in Learning Interest for Experimental Class (Pretest and Posttest)

In contrast, the experimental class showed a significant improvement in learning interest following the intervention. A Paired Samples t-test revealed a statistically significant increase between the pretest and posttest scores, as presented in **Table 13**.

Table 13. Pretest and posttest results for learning interest in experimental class

Class	N	Mean	Std. Deviation	t	Sig. (2-tailed)	Conclusion
Pretest	28	44.46	4.256	-2.267	0.032	H_o rejected
Posttest	28	46.64	2.711			

These results indicate that the intervention successfully increased students' interest in actively engaging in visual arts learning, consistent with intrinsic motivation theory in contextual learning. For the experimental group, the Paired Samples t-test showed a significant increase in learning interest, with t(27) = -2.267 and p = 0.032 (p < 0.05). This indicates that the intervention using painting activities with water hyacinth media had a positive impact on increasing students' learning interest The lack of significant correlation between the initial and final scores (r = -0.017, p = 0.931) suggests that the improvement was more likely due to the intervention rather than the students' learning habits.

12) Changes in Creativity for Control and Experimental Classes (Pretest and Posttest)

For the control class, a Paired Samples t-test was conducted to examine changes in creativity between the pretest and posttest show in **Table 14** and **Table 15**.

Table 14. Pretest and posttest results for creativity in control class

Class	N	Mean	Std. Deviation	t	Sig. (2-tailed)	Conclusion
Pretest	27	53.48	0.643	8.154	0.000	H_o rejected
Posttest	27	48.78	2.764			

The results as presented in Table 14, the experimental class demonstrated a significant improvement in creativity following the intervention. Based on the Paired Samples t-test results shown in **Table 15**, students' creativity scores increased substantially from the pretest (M = 53.93, *SD* = 0.858) to the posttest (M = 62.46, *SD* = 4.426). The analysis yielded t(27) = −9.638 with p = 0.000 (*p* < 0.05), indicating a statistically significant improvement.

Table 15. Pretest and posttest results for creativity in experimental class

Class	N	Mean	Std. Deviation	t	Sig. (2-tailed)	Conclusion
Pretest	28	53.93	0.858	-9.638	0.000	H_o rejected
Posttest	28	62.46	4.426			

This result in table 15 confirms that painting activities using water hyacinth media had a positive and significant effect on enhancing students' creativity. The contextual and art-based learning approach provided greater opportunities for imagination, flexibility, originality, and visual expression. These findings support creativity theories emphasizing exploration and freedom in artistic activities.

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13) Final Results Comparison: Control and Experimental Groups (Learning Interest)

To compare learning interest outcomes between the two groups after the intervention, an Independent Samples t-test was performed. The results are summarized in **Table 16**.

Table 16. Final results comparison for learning interest between control and experimental groups

Class	N	Mean	Std. Deviation	t	Sig. (2-tailed)	Conclusion
Control	27	44.26	2.194	-3.576	0.001	H_0 rejected
Experimental	28	46.64	2.711			

The results from the Independent Samples t-test show a significant difference in learning interest between the control and experimental groups (t = -3.576, p = 0.001). The experimental group's mean (46.64) was higher than the control group's (44.26), with a mean difference of 2.384 points. This indicates that the painting activities using water hyacinth media had a positive impact on increasing students' learning interest. These findings align with the Self-Determination Theory Tam (2023), which emphasizes the importance of contextual learning in enhancing students' intrinsic motivation.

14) Final Results Comparison: Control and Experimental Groups (Creativity)

A further comparison of posttest creativity scores between the control and experimental groups was conducted using an Independent Samples t-test, with the results presented in **Table 17**.

Table 17. Final results comparison for creativity between control and experimental groups

Class	N	Mean	Std. Deviation	t	Sig. (2-tailed)	Conclusion
Control	27	48.78	27.64	-13.807	0.000	H_0 rejected
Experimental	28	62.46	4.26			

The analysis shows a highly significant difference between the control group's posttest creativity score (48.78) and the experimental group's posttest score (62.46), with a mean difference of 13.687 points (t = -13.807, p = 0.000). This indicates that the painting activities using water hyacinth media effectively improved students' creativity. This improvement can be attributed to the exploratory and reflective activities that encourage divergent thinking and visual idea expression, which are crucial components of creativity (Siroj, 2021). These findings support an active and contextual learning approach that enhances students' emotional and cognitive engagement.

15) Multivariate Test

The MANOVA test was conducted to assess the effect of painting activities using water hyacinth natural fiber media on students' learning interest and creativity. Prior to the analysis, Box's M Test was performed, which yielded p = 0.077 (p > 0.05), indicating that the assumption of covariance homogeneity was met show in **Table 18**.

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Table 18. Multivariate test

Effect	Test Statistic	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	0.999	18277.174	2.000	52.000	0.000	0.999
	Wilks' Lambda	0.001	18277.174	2.000	52.000	0.000	0.999
	Hotelling's Trace	702.968	18277.174	2.000	52.000	0.000	0.999
	Roy's Largest Root	702.968	18277.174	2.000	52.000	0.000	0.999
KELAS	Pillai's Trace	0.808	109.671	2.000	52.000	0.000	0.808
	Wilks' Lambda	0.192	109.671	2.000	52.000	0.000	0.808
	Hotelling's Trace	4.218	109.671	2.000	52.000	0.000	0.808
	Roy's Largest Root	4.218	109.671	2.000	52.000	0.000	0.808

Notes:
a. Design: Intercept + KELAS
b. Exact statistic

The multivariate test results are presented in Table 18. As shown in Table 18, the MANOVA revealed a statistically significant multivariate effect of class (experimental vs. control) on the combined dependent variables of learning interest and creativity across all test statistics (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root), with p = 0.000. The Partial Eta Squared value of 0.808 indicates that approximately 80.8% of the variance in students' learning interest and creativity can be attributed to the intervention, which represents a large effect size according to Widiyaningsih & Susanto (2024) criteria. To further examine the effect of the intervention on each dependent variable separately, univariate follow-up tests were conducted. The results of the univariate analysis are summarized in **Table 19**.

Table 19. Univariate test

Dependent Variable	F	Sig.	Partial Eta Squared
Posttest Learning Interest	12.790	0.001	0.194
Posttest Student Creativity	187.547	0.000	0.780

As presented in Table 19, the intervention had a significant effect on posttest learning interest (F = 12.790, p = 0.001, Partial Eta Squared = 0.194) and a highly significant effect on posttest student creativity (F = 187.547, p = 0.000, Partial Eta Squared = 0.780). These results indicate that the intervention had a stronger impact on creativity than on learning interest. Further analysis using pairwise comparisons was conducted to determine the direction and magnitude of the differences between the experimental and control classes. The results of these comparisons are shown in **Table 20**.

Table 20. Pairwise comparisons

Dependent Variable	Mean Difference (Control – Experimental)	Sig.
Posttest Learning Interest	-2.384	0.001
Posttest Student Creativity	-13.687	0.000

As indicated in Table 20, the experimental class achieved a significantly higher posttest mean score in learning interest than the control class, with a mean difference of 2.384 points (p = 0.001, 95% CI [1.047–3.720]). Similarly, the experimental class outperformed the control class in creativity, with a mean difference of 13.687 points (p = 0.000, 95% CI [11.682-15.691]).

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These findings confirm that the observed improvements in the experimental group were attributable to the intervention rather than to random variation.

3.3 Hypothesis Testing

First Hypothesis, he Between-Subjects Effects test showed an F value of 12.790 and p = 0.001, indicating a significant effect of painting activities with water hyacinth natural fiber media on students' learning interest. The Partial Eta Squared value of 0.194 indicates a moderate to large effect. The Pairwise Comparisons also showed a mean difference of 2.384 points between the experimental and control classes (p = 0.001, 95% CI [1.047 – 3.720]). Thus, the first hypothesis is accepted.

Second Hypothesis, The Between-Subjects Effects test showed an F value of 187.547 and p = 0.000, indicating a very significant effect of painting activities on students' creativity. The Partial Eta Squared value of 0.780 indicates a very large effect. Pairwise Comparisons showed a mean difference of 13.687 points between the experimental and control classes (p = 0.000, 95% CI [11.682 – 15.691]). The second hypothesis is accepted.

Third Hypothesis, The Multivariate Tests showed a Wilks' Lambda value of 0.192 with p = 0.000 and Partial Eta Squared = 0.808, indicating a significant effect of painting activities on both students' learning interest and creativity simultaneously. The third hypothesis is accepted.

In conclusion, painting activities using water hyacinth natural fiber media significantly increased both students' learning interest and creativity, supporting a contextual art-based learning approach that enhances active student engagement.

3.4 Discussion

1) The Effect of Painting Activities Using Natural Fiber Media on Visual Arts Learning

The intervention of painting activities using water hyacinth natural fiber media was designed to enhance students' learning interest and creativity. This intervention was applied in the experimental class to provide a contextual and visually exploratory learning experience. The analysis showed that this intervention had a significant impact on both learning interest and creativity variables, with the experimental class showing a greater improvement compared to the control class. Mann-Whitney and t-test results showed a significance of p < 0.001, confirming the strong impact of the intervention on both variables.

This improvement aligns with constructivist theory and experiential learning, which emphasize active student involvement in exploration and reflection. Fauziah et al. (2025) also found that nature-based art stimulates students' creativity through critical thinking and self-expression. Additionally, Masgumelar & Mustafa (2021) stated that constructivist learning, which is active, authentic, and relevant, encourages intrinsic motivation and creativity in students. Overall, the intervention using natural fiber media proves effective as an environmentally friendly and contextual learning alternative, who found that nature-based art enhances creativity, motivation, and environmental awareness in students (Fauziah et al., 2025; Nurjanah, 2024).

2) The Effect of Painting Activities Using Water Hyacinth Natural Fiber Media on Learning Interest

The results of this study show that painting activities using water hyacinth natural fiber media had a positive effect on students' learning interest in grade V. The increase in student

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enthusiasm, active questioning, and higher attention during lessons indicate a clear influence. These findings support the contextual learning approach that enhances students' affective, cognitive, and behavioral aspects, consistent with the learning concept that links material to real-world situations (Rehman et al., 2021).

The use of water hyacinth natural fiber media created an engaging learning experience, stimulating students' curiosity and enthusiasm for exploration. According to John Dewey's theory, experiential learning enhances students' emotional engagement (Siroj, 2021). The painting activity also created a pleasant learning environment, which strengthened students' intrinsic motivation and interest, in line with Álvarez-Huerta et al. (2021) affective taxonomy. This painting activity also provided more value compared to previous methods, as it combined art, the environment, and creativity, aligning with Sarbaitinil & Susanto (2024), who emphasized the importance of a learning environment that facilitates exploration. This finding supports the importance of contextual learning in the Merdeka Curriculum, which has been proven to effectively increase students' learning interest, as also found by (Novianti & Muhaimin, 2023). Thus, painting activities using water hyacinth natural fiber media have proven to be an effective learning strategy in enhancing students' learning interest.

3) The Effect of Painting Activities Using Water Hyacinth Natural Fiber Media on Creativity

The results indicate that painting activities with water hyacinth natural fiber media positively affected the creativity of grade V students. The improvement was evident in how students processed ideas, selected colors, and created unique patterns. The irregular and flexible texture of the water hyacinth challenged students to imagine and innovate, consistent with Tam (2023) creativity theory, which involves flexibility, originality, and idea elaboration.

This activity developed creativity aspects such as fluency, flexibility, originality, and elaboration, leading to more meaningful artwork. Painting enhances students' creativity (Yudhistira et al., 2023). By using natural materials in painting can boost creativity, as students can utilize various natural textures in their artwork (Aeni & Pamungkas, 2024). The paired t-test results showed a high significance ($p = 0.000$, effect size $d = 1.82$), indicating a significant improvement in students' creativity. These findings align with research by Fajrie & Kurniawan (2025), which states that nature-based learning enhances students' thinking flexibility and creative expression.

4) The Effect of Painting Activities Using Water Hyacinth Natural Fiber Media on Both Learning Interest and Creativity

Painting activities using water hyacinth natural fiber media had a significant impact on both students' learning interest and creativity. The MANOVA results showed that 60.6% of the variation in these two variables was influenced by the intervention ($p = 0.000$), proving that creative activity-based learning can develop students' affective and psychomotor aspects. The use of water hyacinth media created an engaging learning atmosphere, stimulating students' curiosity and increasing their involvement in learning. This supports the concept of intrinsic motivation, where students are motivated to learn because the activity is enjoyable and meaningful. Additionally, the challenge of painting on textured media like water hyacinth enhances students' flexibility and creativity, theory of divergent thinking (Novianti & Muhaimin, 2023).

This painting activity developed both aspects simultaneously: learning interest grew because students felt emotionally engaged, and creativity developed because they were

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challenged to innovate. The creativity can be developed through interactive and collaborative learning approaches (Tam, 2023). Overall, the experiential learning approach based on real experiences and exploration of natural materials proves effective in enhancing the quality of learning, consistent with 21st-century education goals. This approach supports contextual learning that can shape students' character and motivation (Widiyaningsih & Susanto, 2024).

4. CONCLUSION

This study concludes that painting activities using water hyacinth natural fiber media have a significant effect on improving students' learning interest and creativity. The analysis results show a significant difference between the experimental and control groups, with significance values of p = 0.001 for learning interest and p = 0.000 for creativity, accompanied by large to very large effect sizes. These findings indicate that the use of natural and contextual media enhances students' affective engagement while simultaneously encouraging creative thinking through visual exploration, freedom of expression, and hands-on learning experiences. Therefore, art learning approaches based on the exploration of local materials are proven to be effective in developing both affective and cognitive aspects of students simultaneously.

However, this study has several limitations. The relatively small sample size and the involvement of only one school context limit the generalizability of the findings. In addition, the short duration of the intervention did not allow for the observation of long-term effects on students' learning interest and creativity, and the variables examined were limited to these two aspects. Future research is recommended to involve larger and more diverse samples, apply longitudinal research designs, and explore the effects of natural media–based learning on other variables such as critical thinking skills, collaboration, environmental awareness, and students' social-emotional development. These efforts are expected to provide a more comprehensive understanding of the potential of local materials in art education and broader educational contexts

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