



The Effect of Using Plastic Waste in Making Handicrafts to Increase Student Creativity

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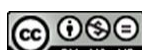
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ABSTRACT

The main problem is lack education of students, especially class IV SDN Petompon 02 regarding the proper and correct disposal and use waste, especially plastic waste. Research was carried out by giving pretest questions to control and experimental classes before giving treatment to experimental class, the end of lesson they were given post-test questions after being given treatment the experimental class, data collection was also taken from questionnaires that had been filled by students. Results this research show the increase in student creativity is high category, meaning use plastic waste as a medium for making handicrafts is effectively used in learning to increase student creativity in craft materials from plastic waste. The novelty of this research is fun learning not only increases students' creativity utilizing plastic waste, but also increases the creativity and artistic spirit of class IV students making crafts from plastic waste student creativity. The results of this research, can help readers find out methods and benefits, as well as the importance reprocessing waste into various forms crafts. This research aims to determine student activities and test effectiveness using plastic waste as medium for making handicrafts to increase activity of class IV students SD Negeri Petompon 02.



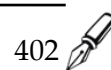
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INTRODUCTION

The accumulation of discarded rubbish scattered everywhere is a sign that local residents are less concerned about cleanliness. Waste has developed into a factual problem at the local, national and international levels. Community development, changes in consumption habits, rapid population increases, and the pace of industrialization are the initial causes of irregular waste management in developing countries (Regina et al., 2021).

The waste problem is one of the important problems faced by Indonesian citizens. In particular, the problem of plastic waste is a common cause of environmental pollution in Indonesia (Enes et al., 2023). The public's opinion regarding waste is that all waste is disgusting, dirty, therefore it must be thrown away or burned properly (Tulfitri & Lilianti, 2020).

Especially for elementary school children who don't really know or even know at all how to properly process and utilize waste. In fact, both parents and children can process recyclable waste into craft products that can produce high selling value and have aesthetic and useful value. In providing education regarding the use of waste to make handicrafts to students, teachers can apply it to SBdP learning, especially fine arts.



Art is a beautiful human work that is realized through aesthetic experiences that a person obtains from their natural social environment (Daniahe et al., 2019). Learning Arts, Culture and Skills, especially fine arts, also plays a role in forming harmonious students by paying attention to the growth and development needs of each child in achieving interpersonal, intrapersonal, creative and emotional intelligence. Fine art is an expression of human feelings, ideas and sentiments which are realized through the media of processing and compiling the elements and principles of design education.

In Learning Arts, Culture and Crafts, especially fine arts. From the description of waste that was previously explained, there were problems found by researchers. Namely, students at SD Negeri Petompon 02 have very low knowledge regarding the correct way to dispose of waste and the use of waste which actually has quite high attractiveness and selling value.

The large amount of rubbish, especially plastic rubbish scattered across the school yard and even in desk drawers, makes students' learning activities uncomfortable. The rubbish problem is often discussed by teachers, because students are often reminded to throw rubbish in its place but still ignore it. Previous research only focused on the correct use and how to recycle plastic waste, but there has been no research that focuses on students' creativity in art by making handicrafts from plastic waste.

Even though artistic creativity plays a very important role, especially for elementary school students. With artistic creativity, especially creativity in using plastic waste as a medium, students can discover, create, or combine something new into a work of fine art with the encouragement of their skills. This encourages researchers to conduct research by analyzing students' creativity in learning fine arts by using plastic waste as the main medium in creating handicraft works.

The difference between this research and previous research is the research subject. Researchers in this study used elementary school students as subjects, namely fourth grade students at SDN Petompon 02 Semarang. In the knowledge of researchers, many researchers only provide qualitative descriptive descriptions regarding the use of plastic waste in making crafts.

Thus, in this study researchers tested the effect of using plastic waste in making handicrafts. This research aims to determine student's learning activities and test the effectiveness of using plastic waste as a medium for making handicrafts to increase the activity of class IV students at SD Negeri Petompon 02 Semarang.

RESEARCH METHOD

This research uses a quantitative approach in the form of experimental research using the true experimental design method. And the research uses a Quasi Experimental research design, namely in the form of a Nonequivalent Control Group Design.

Instrument

This research uses instruments interview with teacher of class IVA, IVB, IVC. documentation, and questioner.

Data Collection Technique

This research take a data with Pretest in class control and experiment, Treatment in class experiment, Post-Test in class experiment and class control.

Subject, Place, and Time of Research

Subject : Class IVA, IVB, IVC

Place : Petompon 02 Elementary School Semarang

Time : February-March 2024

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graph LR; A[Research and Information Gathering] --> B[Planning]; B --> C[Pretest Class Experiment and Control]; C --> D[Giving Material "Plastic Waste"]; D --> E[Treatment Experiment Class]; E --> F[Giving Material "Plastic Waste"]; F --> G[Results and Conclusions];
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The flowchart illustrates the research methodology, consisting of the following steps:

- Research and Information Gathering
- Planning
- Pretest Class Experiment and Control
- Giving Material "Plastic Waste"
- Treatment Experiment Class
- Giving Material "Plastic Waste"
- Results and Conclusions

RESULTS AND DISCUSSION

From the research that has been carried out, the following results were obtained

Table 1. Question validity

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From table 1. It can be concluded that 40 of the 35 question meet the valid criteria that will be used for the next stage consisting of small and large group tests.

Reliability test

Table 2. Benchmarks interpret the degree of reliability of an instrument

Correlation Coefficient	Corretion	Reliability Interpretation
$0,90 \leq r \leq 1,00$	Very high	Very fixed/excellent
$0,70 \leq r \leq 0,90$	Tall	Fixed/good
$0,40 \leq r \leq 0,70$	Keep	Quite fixed/good enough
$0,20 \leq r \leq 0,40$	Low	Not fixed/bad
$r < 0,20$	Very low	Very impermanent/very bad

The reliability test results for 29 valid questions are as follows

Table 3. Reliability test results

Sum PG	Variants	Reliable
8,3	97,12	0,94

From the reliability test with *KR-20* formula using *Ms. Excel software*, the correlation coefficient (*r*) was 0,94. Based on table 3, the level of reliability of the instruments used in the studies very fixed/good.

Differentiating power test

Table 4. Differentiating power index criteria

Differentiating Power Interval	Criterion
$0,00 < DP \leq 0,20$	Question items have poor discriminating power
$0,20 < DP \leq 0,40$	Question items have enough discriminating power
$0,40 < DP \leq 0,70$	Question items have good distinguishing power
$0,70 < DP \leq 1,00$	Question items have excellent discriminiting power

Table 5. The differentiating power of the question

BA/JA	Differentiation Power	Critetion	Number	BA/JA	Differentiation Power	Criterion	Number
0,43	0,50	Good	1	0,15	0,64	Good	19
0,20	0,51	Good	2	0,14	0,79	Good	20
0,38	0,55	Good	3	0,18	0,82	Good	21
0,24	0,41	Good	4	0,00	0,43	Good	22
0,00	0,43	Good	5	0,05	0,59	Good	23
0,05	0,80	Good	6	0,17	0,83	Good	24
0,35	0,65	Good	7	0,00	0,43	Good	25
0,00	0,43	Good	8	0,16	0,84	Good	26
0,09	0,55	Good	9	0,16	0,70	Good	27
0,26	0,45	Good	10	0,09	0,56	Good	28
0,17	0,76	Good	11	0,17	0,62	Good	29
0,16	0,77	Good	12	0,15	0,85	Good	30
0,00	0,43	Good	13	0,12	0,81	Good	31
0,25	0,75	Good	14	0,02	0,41	Good	32
0,17	0,61	Good	15	0,14	0,86	Good	33
0,03	0,54	Good	16	0,00	0,43	Good	34
0,19	0,74	Good	17	0,00	0,21	Enough	35
0,06	0,37	Enough	18				

It is know that the 35 questions have a large number of questions with quite a lot of criteria 2 and good as many as 33 questions.

Difficulty test

Table 6. Difficulty index criteria

Difficulty Index	Interpretation of the Difficulty Index
IK = 0,00	Too difficult
$0,00 < IK \leq 0,30$	Difficult
$0,30 < IK \leq 0,70$	Keep
$0,70 < IK < 1,00$	Easy
IK = 1,00	Too easy

Table 7. Recapitulation of the difficulty level of the question

Number	IK	Criterion	Number	IK	Criterion
1	0,679	Keep	19	0,571	Keep
2	0,464	Keep	20	0,643	Keep
3	0,679	Keep	21	0,750	Easy
4	0,464	Keep	22	0,214	Difficult
5	0,214	Difficult	23	0,393	Keep
6	0,464	Keep	24	0,750	Easy
7	0,750	Easy	25	0,214	Difficult
8	0,214	Difficult	26	0,750	Easy
9	0,393	Keep	27	0,679	Keep
10	0,571	Keep	28	0,464	Keep
11	0,607	Keep	29	0,679	Keep
12	0,607	Keep	30	0,750	Easy
13	0,214	Difficult	31	0,679	Keep
14	0,750	Keep	32	0,250	Difficult
15	0,571	Keep	33	0,750	Easy
16	0,321	Keep	34	0,214	Difficult
17	0,679	Keep	35	0,107	Difficult
18	0,286	Difficult			

It is known that the 35 question have a total of question with easy criteria f 7, medium criteria of 19 and difficult criteria of 9 questions.

Normality test

Table 8. Small group normality test

	Kolmogrov-Smirnov			Shapird-Wilk		
	Statistic	df	Sag	Statistic	df	Sig
Pre	.157	6	.200	.970	6	.892
Post	.204	6	.200	.950	6	.739

The calculation results in table 8, pretest and post-test data have *sig* value, 0.200 and 0.200 or greater than 0.05. So it can be concluded that the pretest and post-test data are normal.

Table 9. Large group normality test

	Kolmogrov-Smirnov			Shapird-Wilk		
	Statistic	df	Sag	Statistic	df	Sig
Pre	.112	47	.179	.975	47	.391
Post	.106	47	.200	.943	47	.023

The calculation results in table 9, pretest and post-test data have *sig* values, 0.179 and 0.200 or greater than 0.05. So it can be concluded that the pretest and post-test data are normal.

Paired t-test

Table 10. Small group paired t-test results

t-Test: Paired Two Sample for Means		
	Post	Pre
Mean	82,85714	31,90476
Variance	71,83673	89,52381
Observations	6	6
Pearson Correlation	0,631122	
Hypothesized Mean Difference	0	
df	5	
t count	16,09432	
P(T<=t) one-tail	8,44E-06	
t Critical one-tail	2,015048	
P(T<=t) two-tail	1,69E-05	
t table	2,570582	

Table 10 shows the *t-test* results of two dependent samples on the final test of the small group obtained values nilai $t_{count} = 16,09$ dan $t_{table} = 2,570$. From the results of calculations obtained $t_{count} = 16,09 > t_{table} = 2,570$ then H_0 is rejected and H_a is accepted or interpreted that the use of plastic waste as a medium in making handicrafts is effectively used in learning to increase student creativity in craft materials from plastic waste.

Table 11. Large group paired t-test results

t-Test: Paired Two Sample for Means		
	Post	Pre
Mean	88,41914	44,63054
Variance	60,33142	60,62753
Observations	47	47
Pearson Correlation	0,132753	
Hypothesized Mean Difference	0	
df	46	
t count	29,31025	
P(T<=t) one-tail	1,04E-31	
t Critical one-tail	1,67866	
P(T<=t) two-tail	2,08E-31	
t table	2,012896	

Table 11 shows the *t-Test* results of two dependent samples on the final test of the large group obtained values $t_{count} = 29,31$ dan $t_{table} = 2,012$. From the calculations obtained $t_{count} = 29,31 > t_{table} = 2,012$ then H_0 is rejected and H_a is accepted or interpreted that the use of plastic waste as a medium in making handicrafts is effectively used in learning to increase student creativity in craft materials from plastic waste.

Test mean increase (N-Gain)

$$N - Gain = \frac{\text{postes score} - \text{pretetes score}}{SMI - \text{pretetes score}}$$

Table 12. N-gain table criteria

N-Gain Value	Criterion
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N-Gain $\geq 0,70$	High
$0,30 < \text{N-Gain} < 0,70$	Keep
N-Gain $\leq 0,30$	Minimum

Based on the above formula, paired *t-test* results are obtained in the Table 13.

Table 13. N-gain table criteria

	Average		Gain	N-Gain	Criterion
	Pretest	Posttest			
Small Groups	31,90	82,86	50,95	0,75	High
Large Groups	44,63	88,42	43,79	0,79	High

Based on the calculations in table 13 it is known that *N-gain* in small and large groups test is 0,75 dan 0,79. These results mean that increasing student creativity is in the high category.

Discussion

Meaning of research findings

The effect of using plastic waste as a medium in making handicrafts to increase the creativity of class IV students at SDN Petompon 02, was obtained from various analyzes including validity tests, reliability tests, discrimination tests, difficulty level tests, *t* tests and N-Gain tests.

The pretest is given at the beginning of learning or before learning material is given. The aim is to determine students' initial knowledge and abilities before being given treatment. The post-test is given at the end of the learning, namely after the learning and treatment has been given. Treatment is only given to the experimental class. The pretest aims to find out how far students' knowledge and understanding are after being given learning and treatment. From the pretest and posttest results, the small group average = 31.90 and 32.86. large group pretest and posttest = 44.63 and 88.42. It is known that the N-gain in the small and large group tests is 0.75 and 0.79. These results mean that the increase in student creativity is in the high category.

The results of the *t* test calculation obtained = $16.09 > 2.570$, so H_0 is rejected and H_a is accepted. In the N-Gain test, it was obtained = $29.31 > 2.012$, so H_0 was rejected and H_a was accepted, which means that the use of plastic waste was effectively used in learning to increase students' creativity in making handicrafts.

One creative method for recycling used drinking bottles into useful items again is to process them into handicrafts. These crafts can be used as objects that have aesthetic value or even have the potential to be resold (Muis et al., 2022). Crafts are one of the various methods that can increase a person's creativity (Rosadah & Jayanuarto 2021). In order to assess a creative product, it can be assessed from authenticity, then from cheapness, to level of difficulty. These handicrafts can be assessed by how inspired the students' creativity is in assembling plastic waste and then decorating the crafts so that they become items that can be reused (Astuti et al., 2019).

The results of the research that has been carried out are commensurate with the results of research by Putra et al. (2022). With the title "*Education of Inorganic Waste Processing into Handicrafts with Creativity Value at Jegu 1 and 2 State Elementary Schools*". The results of this research are that students at SD Negeri 1 and 2 Jegu Village are very enthusiastic about participating in the education that has been implemented. And also the students have realized the importance of sorting and reducing inorganic waste for the surrounding environment. Research by Yulianto and Sulisty (2020) "*Plastic Waste-Based Recycle Art Co-Creation to Enhance the Schools Resident Creative Culture*". The result of this research is that the recycling art creation program using used plastic bottles of mineral water provides an experience that is creative and cultural. This program prioritizes creative activities as school members, shared activities by combining the principles of equality and togetherness. Research by Agustin et al. (2020). With the title "*Training on Processing Plastic into Creative Products for PKK Mothers in Tambak Oso*

Village Sidoarjo". The results of this research are that after the training, the knowledge of PKK women, especially making chairs from used bottles (*eco-bricks*). With *eco-bricks*, they can reduce a lot of waste. Research by Nisa, K., & Ain, SQ et al. (2023) "Use of Used Items in Fine Arts Learning to Support the Creativity of Class IV A Students at SDN 115 Pekanbaru". The results of the research show that students enjoy learning by making handicrafts, producing works of student creativity using used goods. Research by Hanifah et al. (2021) "Increasing Children's Creativity by Utilizing Used Flannel Fabric Decorations for Children at Nurul Yaqin Village TPA A treat." The results of this research are that the activity of creating crafts from waste materials using flannel cloth increases children's creativity and innovation, giving them a platform to express their ideas and imagination. Research by Parasari et al. (2022) "Using Plastic Waste into *Upycled* Products to Increase the Creativity of Students at SD Negeri 4 Senganan, Tabanan." The results of this research were that some elementary school students were less creative in using plastic waste to make crafts, but through this activity they were able to produce 7 creative crafts from plastic waste.

Research implications

Theoretical Implications

This research chose to use plastic waste as a medium for making crafts because it is suitable for activities to hone students' creativity in using used goods, besides that plastic waste is easy to find and the amount is very large. From measuring the assessment of plastic waste that is reused, knowledge is obtained whether it can achieve the stated goals or not.

Practical Implications

The practical implication of this research is that the influence of using plastic waste can be applied in other learning. With this, teachers can vary the media and the learning process to make it easier to achieve learning goals.

Pedagogical Implications

It is easier for students to understand the material, students can show their creativity by using used items to create new objects. And students have knowledge and fun learning activities.

CONCLUSION

Based on research conducted by researchers, the use of plastic waste into handicrafts makes students' learning activities fun and broadens their horizons. Where the activity of utilizing plastic waste builds students' character in being responsible for caring for the surrounding environment, especially the school environment. The effectiveness of using plastic waste as a medium for making handicrafts can increase student creativity. From the calculation results, it is obtained that $t_{\text{count}} = 16.09 > t_{\text{tabel}} = 2.570$, so H_0 is rejected and H_a is accepted and the results of the t_{test} for two dependent samples in the final test of the large group obtained a value of $t_{\text{count}} = 29.31$ and $t_{\text{tabel}} = 2.012$. From the calculation results, it is obtained that $t_{\text{count}} = 29.31 > t_{\text{tabel}} = 2.012$, so H_0 is rejected and H_a is accepted and it is known that the N-gain in the small and large group tests is 0.75 and 0.79. These results mean that the increase in student creativity is in the high category or means that the use of plastic waste as a medium for making handicrafts is effectively used in learning to increase student creativity in craft materials from plastic waste. The results of this research can help readers find out the methods and benefits, as well as the importance of reprocessing waste into various forms of crafts. This research only focuses on increasing students' creativity in using plastic waste as a medium for making handicrafts. Future research can explore and explore how teachers teach students the use of waste in a broad and detailed manner as well as the supporting and inhibiting factors in the activities carried out.

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