

## THE EFFECTIVENESS OF USING ENVIRONMENTAL PROMOTIONAL TOOLS ON STUDENTS' CREATIVITY IN SCIENCE LEARNING

A. Muafiah Nur  
Mu'mina  
Kamelia Marsanda Muslim

<sup>1,2,3</sup>Teacher Professional Education Study Program, Muhammadiyah University of  
Makassar, Makassar, Indonesia

### ABSTRACT

*Science and Social Studies (IPAS) learning requires the use of concrete media to help students understand concepts more meaningfully; However, classroom practice in elementary schools is still dominated by lecture-based methods, which limits the facilitation of students' creativity. This study aims to analyze the effectiveness of using instructional aids based on the surrounding environment in enhancing the creativity of sixth-grade students. The research employed a quantitative descriptive method involving 24 students as participants, with data collected through a Likert-scale questionnaire assessing four creativity indicators: fluency, flexibility, originality, and elaboration. Data analysis included validity testing, reliability testing, frequency distribution analysis, and a One Sample T-Test using SPSS. software. The results indicate that all aspects of creativity exceeded the standard value ( $\mu_0 = 75$ ) with significant t-values, and that 20 students were classified in the "very satisfactory" category while 4 students were in the "satisfactory" category. Therefore, the use of instructional aids based on the surrounding environment is considered effective in enhancing students' creativity. These findings lead to a recommendation for teachers to optimize the use of environment-based instructional aids as a pedagogical strategy capable of enriching learning experiences, increasing student participation, and strengthening students' creative thinking skills in a sustainable manner.*

**Keywords:** Props, Creativity, Science learning

### INTRODUCTION

Science learning requires students to understand scientific concepts concretely, so media that can provide real-life learning experiences is necessary. The use of visual aids is a crucial component of the learning process because they serve as intermediaries that help students connect abstract material with concrete situations around them. Research shows that visual aids can enhance learning effectiveness while maximizing conceptual understanding through visual, motor, and hands-on experiences.(Kencono et al., 2021). In addition, the use of materials or objects from the surrounding environment as teaching aids has been proven to be able to foster student creativity, because it encourages them to explore, imagine, and solve problems through meaningful activities.(Silviana, 2023). The use of materials from the surrounding environment also provides added value in the form of strengthening awareness of environmental issues and reducing waste through recycling practices, thus making the learning process more innovative, environmentally friendly, and relevant to students' daily lives. Therefore, research on the effectiveness of using teaching

aids from the surrounding environment is important to determine the extent to which these media can enhance student creativity in science learning.

Science learning in elementary schools still faces various obstacles which have an impact on the low quality of learning.(Hado et al., 2021)The learning process is often suboptimal because teachers still predominantly use lecture methods, resulting in students being less actively involved and lacking meaningful learning experiences. Teachers also have not utilized media or teaching aids effectively, even though media plays an important role in clarifying concepts and attracting students' attention. Students' interest in science tends to be low because learning is still considered difficult and abstract when teachers do not provide real-world experiences from the surrounding environment.(Wulandari & Ratnasari, 2024). Furthermore, teachers often neglect important components in science learning, resulting in the material becoming merely rote, quickly leading to students becoming bored and unmotivated. Many teachers lack the skills to develop simple teaching aids, even though teaching aids made from materials from the environment can significantly improve students' conceptual understanding and motivation to learn.(Handayani et al., 2022).

Science learning requires direct student involvement through real media to help understand concepts and avoid boredom in learning, but in reality teachers still rarely utilize teaching aids and environmental media optimally in science learning so that student understanding is low and learning only depends on textbooks which makes students passive and less creative.(Erwana, 2015), In fact, the use of teaching aids has been proven to be able to attract students' interest, increase their imagination and creativity in producing new works in science learning as shown by research that found increased creativity through the activity of designing and using teaching aids from simple materials that are easy to find in the students' environment.(Salsabila, 2023). In addition, the low level of student activity in science learning is also influenced by teachers who do not master learning media, so that students are often bored and learning outcomes do not reach the KKM; the application of teaching aids in other studies has been proven to significantly improve science learning outcomes through student involvement in experimental activities and direct observation so that learning becomes more meaningful and motivates students to actively participate in the learning process.(Arief et al., 2024). Initial observations conducted on science lessons in grade VI of SDN 74 Bontorita II showed that learning activities were still teacher-centered. Teachers tended to deliver material through lectures and written assignments, resulting in suboptimal two-way interaction between teachers and students. The learning media used were only textbooks and whiteboards, without the support of visual aids or concrete objects from the surrounding environment. This condition made science concepts seem abstract and provided fewer opportunities for students to experience a contextual learning process. During the lesson, several students appeared to lack focus, chatted with friends, and appeared bored. This indicated that the learning was not engaging enough. Opportunities for students to engage in creative activities such as trying simple experiments or making visual aids were also lacking. In fact, the school environment provides various objects that could be used as learning media, such as used bottles, plants, and rocks.

To address similar problems, several previous studies have offered solutions through utilizing the surrounding environment as a learning medium. Research byMuharianto et al., shows that using the environment as a learning resource provides students with the opportunity to be directly involved in the process of exploration, observation, and making simple tools, making learning more meaningful and not just

limited to delivering material. This approach allows students to understand science concepts through real-life experiences and practical activities, not just through lectures and memorization. (Muharianto et al., 2020). Other research by Kua et al., shows that the use of learning media based on local household products can be a practical solution when teaching aids at school are limited. Simple media such as used bottles, rubber bands, cardboard, or objects from the school environment can be used as aids in experiments and demonstrations. Through this approach, students not only understand concepts through concrete examples but are also encouraged to think creatively in transforming materials around them into learning tools. The research results also show that this strategy makes learning more interesting and can increase student engagement and help teachers deliver material in a way that is easier to understand. (Kua et al., 2024).

Although previous research has shown that learning by utilizing the surrounding environment can help students understand science more concretely, its application in elementary schools is still not optimal, especially in upper grades. Research conducted by Wendi showed that using the environment as a learning resource can support direct learning experiences for students, but the study still focused on fourth grade and did not examine how the strategy was used in sixth grade, which has more complex material and higher cognitive demands. Furthermore, research conducted by Maria showed that the use of locally produced teaching aids can make learning more interesting and contextual, but the study was conducted at the junior high school level. Thus, the results of this study do not fully describe the effectiveness of the same approach for elementary school students, especially in the concrete operations development phase that requires more direct and structured learning experiences. Based on these conditions, this study is novel because it focuses on the use of teaching aids from the surrounding environment in sixth grade science learning with the aim of developing student creativity, not only helping conceptual understanding. In addition to being media users, students are also involved as prop makers so that learning is no longer passive, but encourages exploration, problem solving, and independent expression of ideas. With this approach, the research is expected to provide new contributions to the practice of science learning in elementary schools, especially in schools that previously still implemented teacher-centered learning and had not optimally utilized the environment as a learning resource.

Based on the description of the problems and gaps, this study aims to implement the use of environmental-based teaching aids in science learning in grade VI as an effort to present more contextual, active, and creativity-oriented learning for students. The main problem that is the focus of this study is the lack of use of concrete media in learning which causes students to tend to be passive, less directly involved in the learning process, and have not had the opportunity to demonstrate creativity through making or using simple teaching aids. Through this study, it is hoped that an overview can be obtained regarding the effectiveness of the use of environmental teaching aids in supporting student creativity and becoming an alternative solution for learning that was previously still teacher-centered and limited to textbooks.

## **RESEARCH/EXPERIMENTAL METHODS**

The research method used is a quantitative descriptive research method with a survey design. (Jayusman & Shavab, 2020). Quantitative research is a research approach that uses data in the form of numbers. (Waruwu et al., 2025), this method is used to produce objective results from each statement used in the questionnaire. (Annisa et al., 2024) This

allows researchers to obtain more objective results that are not influenced by personal views or bias.

This research was conducted at SDN 74 Bontorita II, Takalar Regency, South Sulawesi. It involved one sixth-grade class with 24 students as the sample. The research instrument was a questionnaire using a Likert scale designed to measure respondents' level of agreement with each statement in a measurable and systematic manner. The Likert scale instrument used consisted of four answer options: "strongly disagree," "disagree," "agree," and "strongly agree," allowing respondents to choose their level of agreement with the statements presented.

In the data analysis process, the researcher used Jamovi software version 2.6.44 as a data processing tool. The instrument in the form of a Likert scale questionnaire was analyzed through several stages of statistical tests including validity tests, reliability tests, frequency tests, and One Sample T-Test. The validity test was used to ensure that each statement item was suitable for use in measuring student creativity, while the reliability test was used to determine the consistency of the instrument. Next, a frequency test was conducted to see the distribution of student responses to the given instrument. The final stage, namely the One Sample T-Test, was used to determine the effectiveness of the use of environmental teaching aids in science learning based on student perceptions. This series of analysis processes was carried out to ensure that the data obtained was accurate, reliable, and provided a relevant picture of the research objectives.

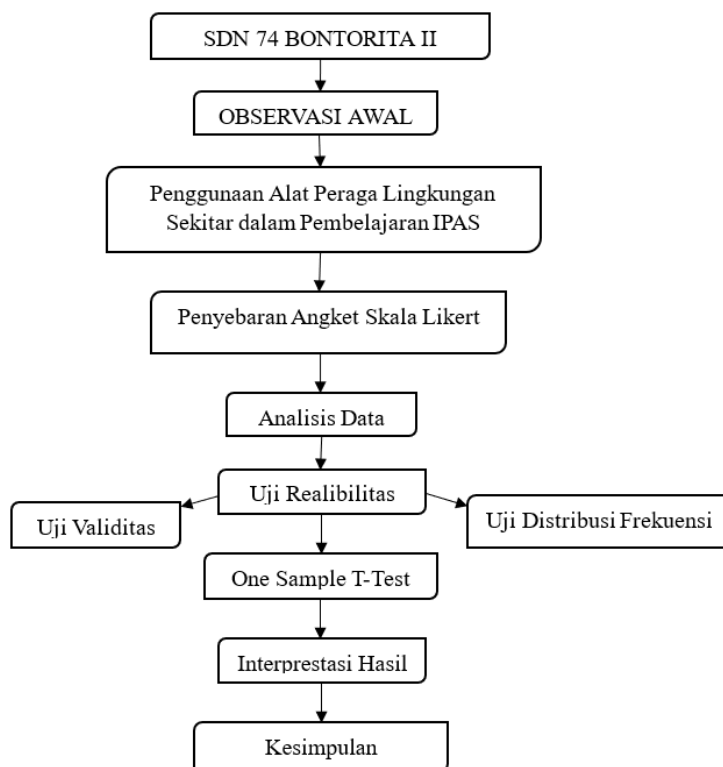


Figure 1. Data Collection Diagram

### 1. Validity Test

Validity testing is used to determine the extent to which a research instrument is able to measure the variables it is supposed to measure, in this case, student creativity after participating in learning using environmentally-based teaching aids. A valid instrument indicates that each statement in the questionnaire accurately represents the construct of creativity and does not deviate from the measurement objectives. According toSitinjak, (2006)Instrument validation is a measure that indicates the levels of validity or authenticity of an instrument. A valid instrument has high validity. Conversely, an instrument that is less valid has low validity.

### 2. Reliability Test

Reliability testing is conducted to determine the instrument's consistency in repeatedly measuring the same variables. A reliable instrument will produce stable results that do not change significantly even when administered under different conditions or times with similar respondent characteristics. In the context of this research, questionnaire reliability aims to ensure that the statements measuring student creativity after learning using environmental teaching aids have a good level of internal consistency.

### 3. Frequency Distribution Test

A frequency distribution is a data presentation that shows the number or number of responses that appear in each answer category. This distribution can be either quantitative or qualitative (category) data and is used to observe the pattern of respondents' responses to a research instrument. According toWahab et al., (2021)Quantitative frequency distribution refers to a series of numerical data arranged according to the number of times they appear in each particular category.

### 4. One Sample T-Test

The One Sample T-Test is used to determine whether the average student perception is above the predetermined standard value. If the calculation results show a significance value of less than or equal to 0.05, then the use of environmental teaching aids can be declared effective in supporting student creativity in science learning. This test helps ensure that the results obtained are not coincidental but have statistical significance. The One Sample T-Test is a parametric test and is usually used on relatively small sample sizes. This test can only be performed if the data is quantitative and normally distributed. The principle of this test is to compare the average sample data with a specific reference value to determine whether there is a significant difference. Thus, this test supports the analysis process to determine the effectiveness of the use of environmental teaching aids based on student perceptions.(Vector, 2017).

## RESULTS AND DISCUSSION

After obtaining initial data through interviews with class teachers regarding the students' creativity and the use of commonly applied learning media, the study continued with the treatment phase, which involved learning using environmental teaching aids. This learning was designed to provide students with hands-on experience so that creative thinking processes could emerge more optimally. After the learning activities, the researchers distributed a questionnaire as a quantitative measurement instrument to determine the level of student creativity after receiving the treatment. The questionnaire used was a structured questionnaire with a four-category scale: very satisfying, satisfying, quite satisfying, and unsatisfactory. Each category indicated the level of achievement of the creativity indicators established in the study.

To facilitate the interpretation of the research results, scores were categorized into several assessment intervals. These intervals were designed based on certain score ranges to classify students' writing abilities. These intervals aim to group student achievement into assessment categories. This classification aims to determine how well students perform based on categories such as Very Satisfactory, Satisfactory, Quite Satisfactory, and Unsatisfactory. "The analysis and presentation of data in this study followed the guidelines of Miles, Huberman, and Saldaña, which emphasize the need for data display in the form of matrices, graphs, or tables to visualize the results. Therefore, the average scores from the questionnaires were analyzed and then converted into categories displayed in interval tables as a form of organized and compressed information collection.(Miles et al., (2015). As shown in the following table:

**Table 1. Assessment Interval**

<b>Interval</b>	<b>Category</b>
66-80	Very satisfactory
51-65	Satisfying
36-50	Quite Satisfying
20-35	Not satisfactory

Each item in the instrument is developed based on learning indicators and is grounded in writing skills theory for elementary school students. Basic principles that must be considered in designing assessment instruments include validity, practicality, continuity, meaning, and orientation toward student competencies. The accuracy of the instrument used in the evaluation will determine the results obtained. Alignment between what is being measured and the measurement tool is crucial to avoid errors when making decisions or drawing conclusions.(Widiastuti et al., 2022). Structured statistical methods, such as cluster analysis, can overcome various limitations and identify distinct groups of respondents.(Helm & Hesse, 2025).

**Table 2. One-Sample t-test**

				95% confidence interval of the difference	
	t	df	sig(2-tailed)	mean difference	lower upper
fluency	13,515	23	0	10,792	9.14 12.44

flexibility	12,206	23	0	14,375	11.14	16.81
originality	13,312	23	0	10,625	8.97	12.28
elaboration	11,992	23	0	10,958	9.07	12.85

Each aspect was analyzed using a one-sample t-test, which yielded a t-value, degrees of freedom (df), significance value (sig. 2-tailed), and a 95% confidence interval for the mean difference. The test results showed that all aspects had a p-value of 0.000, which means it was less than 0.05. Thus, it can be concluded that the four creative thinking indicators showed a very significant difference compared to the reference value used. Positive mean difference values for each aspect—for example, 10.792 for fluency, 14.375 for flexibility, 10.625 for originality, and 10.958 for elaboration—illustrate that the average student's ability was above the reference value. Furthermore, the lower and upper limits of the 95% confidence interval were all positive, thus confirming that the differences were consistent and did not occur by chance. Overall, this table indicates that students' creative thinking abilities in the four aspects tested are classified as high and significantly different from the standard values used as a reference, so it can be said that the intervention or learning conditions studied have a positive influence on improving creative thinking abilities.

The questionnaire data were then collected, grouped according to category intervals, and processed using descriptive quantitative analysis techniques to see the percentage, score trends, and an overview of the effectiveness of the use of environmental teaching aids on student creativity. Based on the results of learning using teaching aids carried out in grade VI of SD Bontorita II, it was found that students' creativity abilities increased, as seen in the following table:

**Table 3. Results of Students' Creative Abilities Who Are Active During Learning**

Observed Student Activities	Number of Students	Student Presentation
Fluency Thinking Skills	8	33.33%
Ability to Adapt to Speed, Place and Way of Thinking (Flexibility)	6	26.67%
Ideas or Concepts (Originality)	5	20.00%
Concluding a Scientific Concept Carefully (Elaboration)	5	20.00%
<b>Total</b>	<b>24</b>	<b>100%</b>

The table above shows creativity indicator data from 24 students, with the results indicating that several students demonstrated good abilities in various aspects of creativity. Fluency ability reached 33.33% with 8 students, indicating that students were able to generate several ideas and create various concepts. The ability to adjust the pace, place, and method of learning was 26.67% with 6 students, indicating the students' ability to adapt to the pace, location, and style of learning. In addition, ideas and concepts were demonstrated by 20.00% of students, with 5 students demonstrating skills in enriching ideas. The ability to conclude a concept carefully reached 20.00%, with 5 students.

The use of teaching aids in science lessons provides a more realistic learning experience for students. They allow students to visualize and manipulate objects related to the concept of gases, which is often difficult to understand in the abstract.(Permana et al., 2024).

Based on the results of the learning conducted by researchers using teaching aids as learning media to obtain data related to student creativity in science learning for class students. As a result, 20 students were classified as "Very Satisfactory", and 4 students were classified as "Satisfactory". Learning activities using teaching aids as learning media helped students improve concentration and confidence in learning. Students were able to articulate their answers and respond to quizzes with a clear and understandable voice. This aspect indicates that students have practiced good articulation and volume control during the lesson.

Teaching aids have a positive impact on student creativity, as seen in the following table:

**Table 4. Student Creativity Results**

<b>INTERVAL</b>	<b>CATEGORY</b>	<b>F</b>	<b>%</b>
66-80	Very satisfactory	20	133.33%
51-65	Satisfying	4	46.67%
36-50	Quite Satisfying	0	
20-35	Not satisfactory	0	
<b>TOTAL</b>		<b>24</b>	

The table above shows that student creativity increased after learning with interactive media, with indicators reflecting significant results: 133.33% in the "Very Satisfactory" category and 46.67% in the "Satisfactory" category. This learning approach gives students space to freely develop new ideas, allowing their thinking skills to be honed effectively. Furthermore, this learning method encourages students to generate creative ideas that align with the theme presented. This increase indicates that learning with teaching aids as a means of fostering student creativity provides an interactive and meaningful learning experience. The interactive learning methods used include educational games, quizzes, and group discussions. Through interactive learning, students can play a more active role and feel significantly involved in the learning process.

To stimulate creative thinking in the learning process, various efforts have been made to encourage student creativity in the classroom, including learning through play, appreciating ideas expressed by students, fostering creativity in learning, and responding positively to student questions and answers. In the learning process, students encounter many new things, from complex concepts to detailed aspects. This certainly requires creativity from students. Therefore, the presence of teachers is crucial to stimulate students to generate new ideas or concepts through the learning process and their experiences.(Ni'mah & Sukartono, 2022).

The use of teaching aids provides students with direct visual experiences, strengthens learning motivation, clarifies abstract concepts, and increases learning absorption. This makes complex concepts easier for students to grasp and improves communication between teachers and students. Teaching aids play a role in enhancing

perception, facilitating knowledge transfer, enhancing understanding, and strengthening learning outcomes.(Wulandari & Ratnasari, nd).

Before the questionnaire was used as a data collection tool in this study, validity and reliability tests were conducted to ensure that each item accurately and consistently measured the intended aspect. Validity tests aimed to determine the extent to which the items in the questionnaire reflected the indicators of the variables being studied, while reliability tests were used to measure the consistency of respondents' responses to the questionnaire.

**Table 5. Validity Test**

Case Processing Summary			
		N	%
Case	Valid	24	100.0
	Excluded	0	.0
	Total	24	100.0

The table above shows the number of respondents and the validity of the data used in the analysis. Valid data = 24 (100%), meaning all data from the 24 respondents were valid and used in the reliability test. Excluded = 0 (0%), indicating that no respondent data was excluded or invalid. This table is the output of statistical software (SPSS version 16.0), which shows the number of cases or data processed in the analysis, both valid and excluded. The valid row shows the number of data deemed eligible and usable for the validity test. In this table, there are 24 valid data points (N = 24), or 100% of the total data. This means that all 24 respondents provided complete answers and could be processed. The excluded row shows the number of data points removed from the analysis process. Data is excluded if it contains blank values, is not filled in, or has errors that prevent processing. In this table, the excluded value is 0, meaning no data is excluded from the analysis. In other words, all respondents provided complete answers according to instructions. The total row represents the total number of data collected in the study, which is 24 data points, or 100%. Since no data points were excluded, the total number of data points remains 24. The purpose of the validation conducted by subject matter experts is to obtain feedback, criticism, and suggestions so that the developed assessment instrument becomes a quality and valid product.(Yamtinah et al., 2021).

**Table 6. Reliability Test**

Reliability Statistics	
Crombach's Alpha	N Of Items
.989	20

The table above shows the results of the reliability test using Cronbach's alpha, which is used to determine the internal consistency of the questionnaire instrument. Cronbach's alpha = 0.989, indicating that the questionnaire instrument is included in the

very high category, meaning it is very reliable and able to provide consistent results when used to measure the same variables under different conditions and times. Cronbach's alpha based on standardized items is also 0.989. This calculation is based on items that have been normalized or standardized. Because the results are the same, it can be concluded that the items in the questionnaire have a good distribution, and the reliability value remains very high even when measured under standardized conditions. N items (Number of Items) in the table indicates that the total number of statement items (items) in the questionnaire is 20. This means that the reliability calculation was carried out on 20 items filled out by respondents. The reliability test for items to measure consistency with Cronbach's Alpha is valid if  $R_{count} > R_{table 5\%}$ , which means the instrument is reliable. The alpha values for the valence and factual instruments are 0.848 and 0.887, respectively. (Astuti & Haryanto, 2017).

The results of this study are in line with previous findings showing that the use of concrete media can improve the quality of science learning in elementary schools. Research by Retnaningsih (2023) revealed that the use of simple teaching aids in science learning not only helps students understand concepts more clearly but also increases student activity and engagement during the learning process. These findings support the results of this study that environmental-based teaching aids can stimulate students to generate new ideas and think more creatively. Furthermore, other research by researchers examining the use of concrete media in science learning shows that real media can strengthen the inquiry process and improve students' science process skills, including the ability to observe, process information, and develop ideas (Taufik Muhammad, 2020). The study explains that when students are faced with real objects, they tend to be more active in exploring and are able to connect abstract concepts with direct experiences, so that the creative thinking process can develop more optimally.

These two studies reinforce the findings of this study, which show that environmental teaching aids effectively enhance the creativity of sixth-grade students. Consistent with previous research, the use of concrete media provides opportunities for students to engage directly, build understanding through experience, and generate more original ideas compared to conventional learning that relies solely on teacher explanations. Therefore, the results of this study confirm that the use of environmental teaching aids is not only pedagogically relevant but also aligned with the needs of science learning, which emphasizes exploratory and developmental activities.

## CONCLUSION

Based on the research results, it can be concluded that the use of teaching aids in improving creativity among sixth-grade students at Bontorita II Elementary School. Teaching aids enable students to be more active in the learning process and enhance their creativity, providing an interactive and meaningful learning experience. Therefore, the application of teaching aids in elementary school can be an effective tool for improving student creativity in learning.

This study has several limitations, including: first, Creativity is a complex and multidimensional aspect, but this study only measured it through a student perception questionnaire. This makes the results tend to be subjective and depend on the honesty and understanding of students in filling out the questionnaire. Second, Learning using environmental teaching aids was implemented for a limited time so that its impact on creativity may not be optimally visible. Changes in creativity generally require long-term

habituation. Third, External factors such as classroom conditions, learning atmosphere, or interactions between students can influence creativity scores but cannot be fully controlled by researchers. Future research with a larger sample size, longer duration, and comparison with other media can provide a more comprehensive understanding of the impact of teaching aids on student development.

Based on the research findings, teachers are advised to make greater use of teaching aids sourced from their local environment, as these media have been shown to increase student creativity and engagement in science learning. Schools can support this effort by providing simple training for teachers and facilities that allow for independent teaching aid creation. Further research can be conducted with a broader scope and longer timeframe to more fully assess the impact of teaching aid use and compare it with other learning media.

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