The Impact of Realia Media on Elementary School Students' Learning Achievement: An Experimental Study on Science Subjects

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ABSTRACT

This study aimed to assess the impact of realia media on the scientific learning achievement of fourth-grade pupils. This study employed a pre-experimental design utilizing a quantitative research methodology. This research was carried out at Elementary School Inpres 18 in Sorong Regency, using a sample of 30 children. This study utilized observation sheets for teachers and students, along with multiple-choice exam items. The data analysis employed the SPSS 25 software. The findings indicated that the mean score for teacher and student evaluations was 100%, meeting excellent standards. The investigation of student learning completeness yielded an average pretest score of 4.46 and a posttest score of 6.96. The N-Gain test yielded an average pretest score of 0.45, indicating it falls within the moderate range with a reasonably effective level of efficacy. Consequently, it is determined that realia media positively influences student learning achievement in science topics, rendering them more engaging and effective, thereby enhancing student performance as evidenced by the N-Gain test results.

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1. Introduction

Media plays a crucial role in the educational process, serving as a fundamental component of teaching and learning (Masterman, 2018; Sudarmo et al., 2021). Utilizing learning media enables students to cultivate their creativity and comprehend all facets of the educational process (Seechaliao, 2017; Lawrence & Tar, 2018; Komljenovic, 2021). Utilizing media tailored to the subject matter's features can enhance student engagement and enthusiasm in learning (Saputro et al., 2022). Consequently, media can assist educators in material delivery, while teachers can impact diverse classroom scenarios by adopting more active and inventive approaches (Hardiansyah 2022; Daryanes et al., 2023; Mulatipo et al., 2024). This educational media facilitates teachers in executing the teaching and learning process more efficiently (Abdulrahaman et al., 2018; Lawrence & Tar, 2018; Isir et al., 2024). Thus, abstract and unfamiliar concepts are rendered tangible and comprehensible for students. When utilized effectively, media significantly engages students in the teaching and learning process, enabling them to apply it correctly and precisely (Tamrin et al., 2017; Saputro, 2023).

A preliminary study on grade IV pupils at Elementary School Inpres 18 Sorong Regency revealed a gap in the learning process of natural sciences topics. Interviews with grade IV instructors and inspections of student report books indicate that Natural Sciences instruction is highly effective when engaging learning media is utilized. This seeks to affect students' motivation for learning, hence impacting their science learning achievement. Students must elucidate many processes pertinent to the subject matter during the scientific learning process. It is determined that (1) students continue to struggle with active participation in the learning process, particularly in articulating explanations and responding to inquiries effectively, and (2) pupils appear disengaged due to the insufficient utilization of engaging media. Students exhibit a lack of concentration during the educational process, and they have challenges in engaging with the learning material. The capacity to comprehend each topic is seen in the outcomes of the practice questions completed during one semester.

Informed by the findings of the preliminary investigation, the author aims to address this gap by employing engaging and interactive learning media in scientific education to enhance student learning achievement. The appropriate medium for engaging students in the science learning process is exhibition learning media, namely the realia type. Realia, or physical media, are tangible things utilized in the educational process to engage students' attention,

enhance cognitive skills, and facilitate direct learning through observation and explanation (Susilowati et al., 2021; Amalia & Nur, 2023). Real things as educational media serve as instruments for transmitting information through tangible, authentic items that remain mostly unaltered (Puspaardini et al., 2019).

Realia Media refers to tangible objects utilized as media. The utilization of authentic media facilitates pupils' proximity to tangible objects, thereby enhancing comprehension (Liono et al., 2021). Authentic media are tangible artifacts that facilitate genuine experiences for students and stimulate their interest and excitement for learning. Realia media are highly pertinent as a teaching resource in education (Ekayani, 2017; Febriani et al., 2023). The attributes of realia media are as follows: Realia media consists of intact objects that are readily available, simple to utilize in daily life, compact in size, and have an easily comprehensible and recognizable appearance. Realia media facilitates student participation in expressing ideas and opinions, thereby enhancing creativity (Lalian et al., 2019). Realia media, as authentic media, can alleviate students' challenges in theme learning by engaging all their senses with tangible items, enabling them to articulate, recount, reference, and retain teachings derived from these real objects (Ibad and Sarifah, 2020).

Realia media, also referred to as visual aids, are utilized in accordance with the requirements of the learning process, encompassing instructional materials, student characteristics, and the learning environment that fosters student learning experiences (Saputro, 2023). Realia media serves multiple tasks within the educational sphere. The primary goal of real media is to serve as a visual tool for presenting material to students, thereby enhancing interest, motivation to learn, cognitive skills, and engagement in the educational process (Handayani & Subakti, 2021; Mafluda & Wati, 2024). Three categories of realia media exist: real things, modified real objects, and specimens (Lestari & Mustika, 2014; Rahmawati, 2020). Table 1 presents the pros and cons of real media in education.

Table 1. Advantages and Disadvantages of Realia Media

Advantages	Disadvantages
Realia media is easy to use and obtain.	No actual or complete images are available.
Provides opportunities for students to engage in real tasks and simulations.	Prepare relevant teaching techniques to easily control learning achievement.
Facilitates student assessment systems.	The situation presents a high level of danger.
Develops thinking skills.	Must be trained when using it.

Advantages	Disadvantages
Involves all senses in the learning process. Delivers learning messages more accurately and effectively.	Not all materials can use realia media. Not all objects can be used as realia media.

Numerous prior researchers have extensively investigated realia media (Apriyansyah, 2018; Indra & Dewi, 2019; Azizah et al., 2021; Susilowati et al., 2021; Arifin et al., 2023). Nevertheless, additional research within the realm of realia media enhances motivation, children's naturalistic intelligence, student comprehension, scientific abilities, and artistic proficiency. This study primarily investigates the impact of realia media on students' science learning results.

Consequently, drawing from initial studies, problem descriptions, and deficiencies in prior research, the author seeks to investigate the effect of realia media on the science learning results of elementary school pupils. This study has two variables: the independent variable, which represents the influence of realia media, and the dependent variable, which pertains to science learning achievement.

2. Research Methods

The research methodology employed is pre-experimental research. This research requires only one group, which undergoes an initial assessment (pre-test) prior to instruction and a concluding assessment (post-test) following the completion of multiple sessions. This study employs quantitative experimental research design. Experimental study involves the manipulation of a research subject for comparative analysis. This research is conducted to evaluate a design specifically to get the data required to address the research problem formulation.

Data collection for the study was conducted at Elementary School Inpres 18 in Sorong Regency. The subjects of this study were all students in grade IV of Elementary School Inpres 18 Sorong Regency, comprising a single class, IV A. The sample in this study comprised 30 pupils from grade 4 A, designated as the experimental class. This study employs two types of data-gathering instruments: observation sheets and science subject test questions. The evaluation of student learning achievement commenced with the computation of pre-test and post-test science scores. Upon acquiring the comprehensive learning achievement represented by science test scores, the researcher employed SPSS to do calculations for normality, homogeneity, and the N-Gain test to address the research hypothesis.

3. Results and Discussion

Results

Descriptive Data Analysis

The pretest data-gathering findings of student engagement in science learning before the implementation of realia media revealed a minimum score of 30 and a maximum score of 70. The average is 4.46, the variation is 2.38, and the standard deviation is 1.54. The posttest results for student learning activities utilizing realia media revealed a minimum score of 30 and a maximum score of 100. The average is 6.96, the variation is 6.76, and the standard deviation is 2.60. Figure 1 below presents the average values of the students' pretest and posttest.

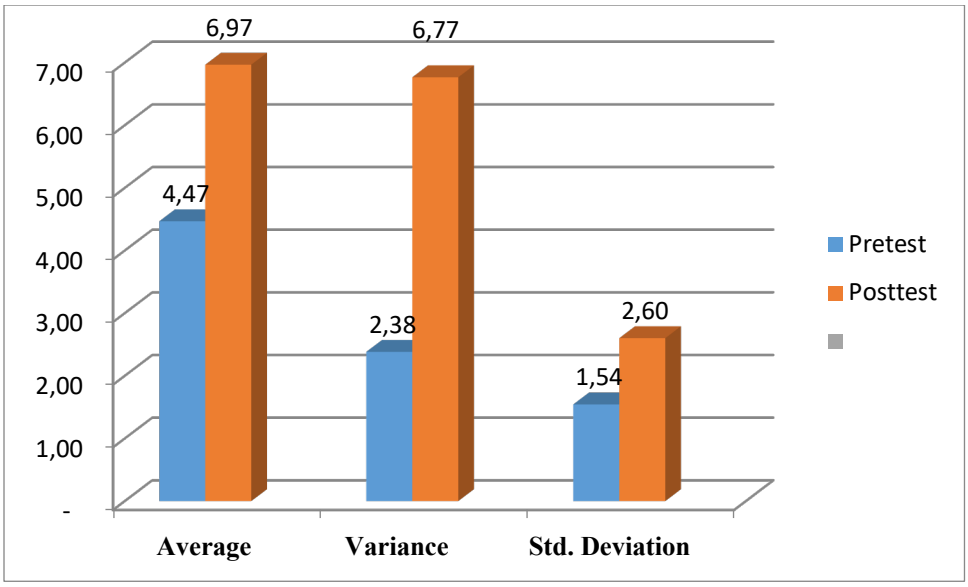

Figure 1. Average Pretest and Posttest Values

Normality Test

The subsequent results pertain to the study of normality and homogeneity tests for the pretest and posttest data, as presented in Table 2 and Table 3 using SPSS.

Table 2. Normality Test Results

Data	Chi-Square (X2)	Significance	Information
Pretest-Posttest	0.35885	0,05	Normal

Table 2 demonstrates that the results of the normality test, as demonstrated by the Chi-Square (X2) values, establish the normality of the data, with a significance level of $\alpha > 0.05$. The derived value of 0.35885 signifies a normal distribution. The results of the data normality test indicate a normal distribution.

Homogeneity Test

Table 3. Homogeneity Test Results

Data	Variance	Significance	Information
Pretest	0.422764	0,05	Homogen
Posttest	0.495695	0,05	Homogen

The homogeneity test findings for the pretest indicated a variance value of 0.422764, as presented in Table 3, which exceeds the significance threshold of 0.05, so demonstrating that the pretest data is homogeneous. The homogeneity of variance results for the posttest indicated a significant value of 0.495695. The significance value over 0.05 indicates that the posttest data is homogeneous.

N-Gain Test

The subsequent section delineates the computation of the N-Gain value, and the interpretation of the N-Gain results as illustrated in Table 4, derived from the examination of pretest and posttest data.

$$\text{N-Gain} = \frac{Score\ Post-test - Score\ Pre-test}{Score\ Ideal - Score\ Pre-test}$$

$$= \frac{6{,}96-4{,}46}{10-4{,}46}$$

$$= 0{,}45$$

Table 4. Results of N-Gain Test Analysis

Average N-Gain	N-Gain	Classification	Level of Effectiveness
$0{,}30 \leq (g) < 0{,}70$	0,45	Medium	Quite Effective

The N-Gain value of the pretest and posttest data is within the moderate category, as indicated by the results in Table 5. This indicates that the average post-test value in the moderate category has increased in comparison to the pretest. Consequently, it is inferred that the science learning achievement of elementary school pupils are influenced by realia media.

Discussion

The significance level of student learning achievement (pretest) is 0.35885, which is greater than 0.05, as determined by the processing of normality test data obtained from calculations using SPSS statistical software. The posttest results of student learning are normally distributed, as evidenced by a significance level of 0.35885, which is greater than the significance level of 0.05. The data in the investigation have the same variance, as can be inferred from this analysis.

The results of the homogeneity test indicate that the variance data is homogeneous. The pretest variance value of 0.422764 surpasses the significance level of 0.05. The posttest variance of 0.495695 above the significance threshold of 0.05. This indicates that the outcomes of the homogeneity test analysis are, in fact, homogeneous. To determine the degree of increase in pretest and posttest values, homogeneous and normally distributed data are utilized. The N-Gain test analysis revealed that the pretest and posttest N-Gain values were 0.45. The findings indicate that the N-Gain value meets the moderate requirements, demonstrating a moderate level of effectiveness. Consequently, it can be deduced that the utilization of realia media in science education enhances student learning outcomes, categorizing the improvement as modest.

This study's results are relevant and supported by earlier research by Amalia and Nur (2023), which says that real-life media plays a big role in how fourth-grade elementary school students learn science and how the learning process works. This is evidenced by multiple factors, including heightened student enthusiasm for learning, improved comprehension of the material due to direct experience, and increased curiosity that mitigates boredom during the educational process. Furthermore, the findings of this study are corroborated by Algiranto et al. (2021) and Kurniansyah et al. (2024), both of which assert that the utilization of realia media greatly enhances student engagement and academic performance.

Fourth-grade students did better in science when they used realia media (Setyaningsih et al., 2019; Mulatipo et al., 2024) because the teaching materials were real things that were in the students' immediate environment. Realia media provide precise and reliable information as they consist of tangible objects (Rosdiana, 2017; Rahmawati, 2020; Saputro et al., 2022). The benefits of utilizing realia as a pedagogical tool encompass the ability to stimulate student creativity by incorporating real-world experiences into the classroom setting (Apriyansyah, 2018; Algiranto et al., 2021; Amalia & Nur, 2023). Realia is a highly effective tool for seeking information and acquiring knowledge through personal experience. It offers authentic and instantaneous experiences, as well as a level of aesthetic appreciation not found in other media formats. It elucidates the transmission of messages beyond mere written or verbal communication.

4. Conclusion and Suggestions

The study's results, data analysis, and discussion indicate that realia media significantly impacts students' science learning achievement. This is evidenced by the average observation scores of teachers and students, which stand at 100% with commendable criteria. The findings

of the learning completeness study indicate an average pretest score of 4.46 and a posttest score of 6.96. The N-Gain Test value derived from the pretest and posttest was 0.45, categorizing it as moderate with a reasonably effective level of efficacy. Consequently, it is determined that the impact of realia media utilizing two-dimensional imagery on students' academic performance in science topics is more engaging and effective, leading to an enhancement in learning results.

The study's results could help elementary school teachers improve their students' learning by using realia media, especially diverse realia media. These results also suggest that more research be done to make interactive media that is more interesting and useful for improving students' learning.

5. Conflict of Interest

The author declares no conflict of interest.

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