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## **Fun thinkers book and science textbook: Which is more effective in improving elementary school students' comprehension?**

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**Abstract:** Science textbooks are widely available and accessible in elementary schools, often at no expense to students. However, evaluating and comparing their effectiveness with a visually engaging alternative, such as a fun thinkers book model that incorporates numerous illustrations, is necessary. Elementary school students exhibit a strong favor for images over text. This study aims to assess students' comprehension abilities utilizing the fun thinkers book and traditional science textbooks. This study employs a quasi-experimental design with a non-equivalent pretest-posttest control group design. The data collection method employed a test instrument to assess knowledge and practices related to waste management with an environmental theme. Data analysis employed an independent sample t-test to assess the statistical significance difference between the experimental and control groups. The findings indicated that the students who utilized the fun thinkers book exhibited a better understanding of waste management than those who relied on the textbook. Including pictures in the fun thinkers book enhanced the learning engagement of elementary school students, resulting in a higher level of comprehension than students who used the textbook alone.

**Keywords:** Textbook, Fun thinkers book, Comprehension

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## INTRODUCTION

The function of books is very important in supporting student learning success. Teachers commonly utilize books to attain desired educational objectives. Books serve as educational tools that facilitate the transmission of information from teachers to students (Nahdi & Jatisunda, 2020; Rusydiyah et al., 2021). Books serve as a medium that aids teachers in expanding students' perspectives (Chabalengula et al., 2020; Ahmad et al., 2021) and fostering their enthusiasm for learning (Rusydiyah et al., 2021; Hamidah et al., 2020). Hence, it is imperative to consistently enhance the quality of books to meet students' requirements. Enhancing the book's design and content is crucial in facilitating the attainment of learning objectives, particularly when these aspects are deemed inadequate. Inadequate design and content may limit pupils' comprehension. The visual representations presented in the book have the potential to stimulate the curiosity and engagement of elementary school students. One of the book design ideas that education experts have produced is fun thinkers book.

The fun thinkers book is a learning tool that resembles a book, allowing students to engage in play-based learning (Anjarani et al., 2020). According to Anggraini and Asmarani (2021), using the fun thinkers book media is enjoyable for students. Fun thinkers book media is deemed relevant. Fun thinkers book media offers several advantages. (1) It is portable and easy to carry. (2) It can be designed to cover a wide range of subjects. (3) It has the ability to stimulate a sense of enthusiasm for learning (Kusno & Kusuma, 2020). The fun thinkers book is an educational resource designed to facilitate learning through interactive play. Students are instructed in image analysis, question answering, and image matching skills. This learning approach will enhance students' creativity and enthusiasm for learning. Incorporating enjoyable and thought-provoking books, educational media, and interactive learning materials is deemed significant for the developmental progress of elementary school students with a penchant for play.

Numerous studies have been conducted to evaluate the efficacy of fun thinkers book media in elementary schools, resulting in improved learning outcomes (Mantika et al., 2022; Ni'mah, 2022; Putri et al., 2022; Wulandini et al., 2022). Research has shown that fun thinkers books can enhance students' critical thinking abilities (Upadani et al., 2021) and foster their creative thinking skills (Agustina & Purwanti, 2022). Previous studies have primarily focused on evaluating the fun thinkers book's effectiveness on student interest, critical thinking skills, and creativity. While numerous studies have demonstrated the efficacy of its influence on student learning outcomes, evaluating its outcomes in comparison to traditional textbooks is imperative. It is essential to compare the effectiveness of textbooks and fun thinkers books due to the widespread provision of government textbooks for student education in schools.

Textbooks are readily accessible in schools and are sometimes provided by the government as free e-books for educational use by teachers and students. Government-published standard textbooks for educational resources undergo thorough expert reviews and validation (Philip, 2018; Komalasari, 2010). Many textbooks in schools are underutilized due to students' lack of interest in the most common content presented in these books. Numerous textbooks in school libraries indicate that the government recognizes textbooks as a suitable educational tool for enhancing student comprehension. In practice, students exhibit a preference for books that incorporate numerous illustrations and appealing colors, such as the fun thinkers book model (Putri, et al., 2022). The fun thinkers book is practical and has engaging content. It features numerous pictures and concise text that briefly explains the material covered in the book, specifically related to the subject of study (Ni'mah, 2022; Anjarani, 2020). Hence, it is imperative to conduct research to ascertain the efficacy of textbooks and Fun thinkers books in enhancing the comprehension of elementary school students.

Measuring the effectiveness of books as learning media is crucial, particularly in assessing students' comprehension of concepts. Achievement-oriented students possess a strong understanding of instructions and tasks. Therefore, it is necessary to assess the level of comprehension in the learning process, even if it is not the primary focus in certain subjects. While fun thinkers book media may be enjoyable for students, it is important to note that learning cannot be solely evaluated based on the extent to which it pleases students. Measuring the understanding of concepts is an important indicator of learning success. This study examines the comprehension difference between students instructed through fun thinkers book media and students exposed through textbook media. This study focuses on waste management as a teaching theme, as teachers commonly teach it through practical methods. Before engaging in practical activities, it is necessary to provide knowledge on proper waste management through appropriate educational resources. This study aims to evaluate the efficacy of two types of media, e.g., the fun thinkers book media and textbook media, in educating elementary school students about waste management in the school setting.

## METHODS

### Research Design

This study employed a quasi-experimental research design, specifically a non-equivalent pretest-posttest control group design. The study utilizes an experimental design to compare the outcomes of the experimental group with those of the control group (Fraenkel et al., 2012). The measurement of students' comprehension of waste processing was conducted both before and after the learning time. The experimental group received fun thinker books media with pictures and explanations of waste management stages. In contrast, the control group received a textbook with only descriptions of waste management stages, without images. The research design is presented in Table 1.

### Participant

The study involved a sample of 45 students in public elementary school 43 Ampenan, Mataram region. The sample included 24 students in grade VA as the experimental group and 21 students in grade VB as the control group. A description of the samples in each group is shown in the following table.

The character of the school is based on the atmosphere of the learning process using the latest curriculum implemented by the government, namely the Kurikulum Merdeka. Elementary school 43 Ampenan has a mini library which can be used by all students in turns. Textbooks are available according to the curriculum used. Meanwhile the fun thinkers book is designed by the teacher.

**TABLE 1.** *Research design of pretest-posttest control group design*

Group	Pretest	Treatment	Posttest
Experiment	01	Media Fun Thinker books	02
Control	01	Media textbook	02

**TABLE 2.** *Sample description in each group*

Group	Sample	Sex	
		Man	Woman
Experiment	24	8	16
Control	21	9	12

**TABLE 2.** *Indicators of understanding waste processing*

Aspect	Indicator	Questions Form
Recognizing waste problems	Explaining the phenomenon of waste problem	1. Describe water pollution in your environment! 2. What causes the pollution to occur?
Sorting organic and inorganic waste	a. Identifying the characteristics of organic and inorganic waste b. Explaining how to sort waste	1. What types of waste are in your environment? 2. Give examples of organic waste! 3. Give examples of inorganic waste!
Managing waste through the 3R method	a. Mentioning the 3R method definition b. Describe examples of 3R method activities	1. What is meant by reuse in processing waste? 2. Name 2 examples of ways to reduce waste 3. Name 2 examples of ways to recycle waste!
Making compost	a. Identifying composting materials b. Describe the stages of making compost	1. Describe the types of waste that can be used as compost! 2. Explain the 5 stages of making compost!
Waste management benefits	a. Explaining ecological benefits b. Explaining economic benefits	1. Explain the benefits of processing waste for the ecosystem 2. Explain the benefits of processing waste for the economy

**Material**

The data collection method employed a test instrument about the way to do waste management within the environment sustainability theme. Tests are the primary means of gathering data on students' comprehension of waste management. The instrument's feasibility was confirmed through validation by experts in the lesson materials and experts in learning evaluation. The table displays the indicators of the test instrument.

**Data Analysis**

Data analysis employed an independent sample t-test to assess the statistical significance of discrepancies between the experimental and control groups. Before conducting the t-test, the n-Gain score test was administered to assess the efficacy of the activity by comparing pretest and posttest scores within each group. Determining the category of pretest and posttest differences in each group is based on the provided provisions.

According to Hake (1999), a score of  $g > 0.7$  indicates a category that is classified as very effective. A score of  $0.3 \leq g \leq 0.7$  suggests a category that is classified as effective, while a score of  $g < 0.3$  indicates a category that is classified as less effective. After calculating the n-Gain scores for each group, a t-test is conducted to test the research hypothesis.

The zero hypothesis ( $H_0$ ) states that no statistically significant difference exists between students who learn through fun thinkers book media and those who learn through science textbook ( $\mu_1 = \mu_2$ ). The alternative hypothesis ( $H_a$ ) states a significant difference ( $\mu_1 \neq \mu_2$ ) between students who learn through fun thinkers book media and students who learn through science textbook.

**RESULTS**

The differences in the stages of the learning process using a fun thinkers book and a text book are shown as Table 3.

The comprehension test was administered following the completion of the learning process by both the experimental and control groups of students. Both groups received the same set of 15 questions. The questions have been validated by experts and are considered valid, as indicated by the average score of Aiken V index = 0.83. The table below presents the data description of the results of a comprehension test administered to students taught waste management using the fun thinkers book and textbook.

Based on the provided table, it can be observed that there is no statistically significant difference in the average level of students' comprehension regarding waste processing before treatment. Specifically, the experimental group exhibited an average score of 62.5, while the control group had an average score of 61.70. Following the intervention, a notable disparity is observed in the magnitude of the average value increment, with the experimental group exhibiting an average value of 89.60, in contrast to the control group's average value of 70.25. When considering the proportion of students who possess knowledge regarding waste processing in both the experimental and control groups, the levels of comprehension can be classified as understand very well, understand, less understand, and very least understand. The tabulated data presents the outcomes of the computation of the proportion of pupils across several categories.

**TABLE 3.** *Learning stages using fun thinkers books and text books*

Stage	Using Fun Thinkers Book Media	Using Text Book Media
Beginning	1. Conditioning class 2. Brainstorm environmental pollution problems	1. Conditioning class 2. Brainstorm environmental pollution problems
Main	3. Students discuss in groups 4. Analyze water, land and air pollution incidents in the fun thinkers book 5. Discussion of solutions to environmental pollution using the 3R method 6. Practice waste processing according to the pictures in the fun thinkers book	3. Students discuss in groups 4. Analyze the content of the textbook 5. Discuss pollution solutions based on the problems in the textbook 6. Practice waste processing according to the instructions in the textbook
End	7. Formulate material conclusions	7. Formulate material conclusions

**TABLE 4.** *Data description of pretest dan posttest*

Group	Test	Mean	Std. Deviation	Maximum	Minimum
Experiment (fun thinkers book)	Pretest	62.25	11.4	65	50
	Posttest	89.60	15.03	93	72
Control (textbook)	Pretest	61.70	10.3	64	47
	Posttest	70.25	11.5	82	63

**TABLE 5.** *Percentage of students who understand how to process household waste*

Comprehension Aspect	Percentage of Students' Comprehension Level							
	Experiment Group				Control Group			
	1	2	3	4	1	2	3	4
Recognize the waste problem	8.0	21.5	29.0	41.5	10.0	22.0	36.5	31.5
Sorting organic and inorganic waste	0	16.5	16.0	67.5	18.5	21.5	39.5	20.5
Managing waste through the 3R method	5.0	15.0	35.0	45.0	11.5	32.5	40.5	16.0
Compost making	0	17.5	21.5	61.0	9.0	27.0	32.5	31.0
Waste management benefits	0	16.5	17.0	66.5	10.5	28.0	39.0	22.5

*Description: 4 = understand very well, 3 = understand, 2 = less understand, 1 = very least understand*

The analysis of n-Gain scores for the pretest and posttest data of the experimental group yielded a result of 0.47, whereas the control group exhibited a score of 0.21. The average value of the experimental group is 0.47, which the control group has an average value of 0.21. According to the categorization framework proposed by Hake (1999), known as the n-Gain score category, the disparity observed between the pretest and posttest scores of the experimental group may be classified as moderate. This indicates a noteworthy distinction in the learning outcomes while utilizing the fun thinkers book. The control group is classified as having low performance, or the difference between pretest and posttest scores is less apparent in the context of textbook-based learning. The analysis of n-Gain scores indicates a considerable rise in the test scores of students' understanding of waste management in the experimental group.

The significance of the difference in scores between the two groups can be determined by doing a t-test analysis. If the results of this analysis fulfill the criteria of sig. (2-tailed)  $< 0.05$ , or it indicates that there is a statistically significant difference between the experimental group and the control group. The t-test analysis using SPSS software yielded a significant result, the sig. value (2-tailed) of 0.00, indicating that the sig. value (2-tailed)  $0.00 < 0.05$ . The zero hypothesis ( $H_0$ ) is rejected, indicating a substantial difference between students who learn through fun thinkers book medium and students who learn through textbook media ( $\mu_1 = \mu_2$ ). The alternative hypothesis ( $H_a$ ) stating that there exists a statistically significant difference between students who engage with educational content through interactive media such as fun thinking books and students who rely on traditional textbook media ( $\mu_1 \neq \mu_2$ ) is accepted.

## DISCUSSION

The research was carried out on a sample of elementary school children in the fifth grade. This study aims to assess and compare the efficacy of educational media in the form of fun thinking books and traditional textbooks. The curriculum delivered to pupils relates to the subject of waste management. The participants in the experimental group were provided with educational materials of a book containing visual content and limited textual explanations. These materials aimed to convey information regarding the distinguishing characteristics of organic and inorganic waste, provide examples of both types of waste, illustrate proper waste management practices through the 3R approach, and depict the various stages involved in compost fertilizer production. The control group received educational materials from textbook media that included explanations of various waste issues encountered in daily life, distinguishing characteristics between organic and inorganic waste, specific instances of organic and inorganic waste, an elucidation of the 3R approach for waste management, and a description of the sequential stages involved in the composting process of organic waste.

The t-test results indicated significant differences in the understanding of students taught using Fun thinkers book media compared to those taught using textbook media. The utilization of fun thinkers book media demonstrates a higher level of student comprehension than textbook media. The t-test findings are supported by the percentage of students' comprehension of household waste management following the educational intervention. The analysis of the student understanding test in waste management reveals that the experimental group demonstrated a significantly higher level of recognition of the waste problem than the control group. Specifically, 41.4% of students in the experimental group fell into the very high category, whereas only 31.5% of students in the control group achieved the same level of understanding. The experimental group had a much higher level of comprehension in distinguishing between organic and inorganic waste, with 67.5% of participants achieving a very high knowledge. In contrast, the control group only attained a comprehension rate of 20.5%, indicating a lower level of understanding than the experimental group. The experimental group demonstrates a significantly higher level of understanding (45.0%) in managing waste through the 3R method than the control

group (16.0%). This indicates that a greater proportion of students in the experimental group possess knowledge on how to manage waste using the 3R concept effectively. The composting skill within the experimental group's very high understanding category was recorded at 61.0%, whereas the control group exhibited a composting proficiency of 31.0%. This indicates that a greater proportion of students in the experimental group possessed the knowledge and skills required to engage in composting as compared to the control group. The percentage of students in the experimental group who shown a high level of understanding about the benefits of waste management was 66.5%, whereas in the control group, this percentage was 22.5%. This indicates that a greater proportion of students in the experimental group exhibited comprehension of the advantages associated with waste management compared to the control group.

The description suggests that using fun thinkers book media to teach elementary school students about waste processing can effectively enhance their understanding. Incorporating enjoyable and thought-provoking books and media in education fosters student creativity and enhances their comprehension (Peng & Fu, 2021; Wijaya et al., 2021). The study found a positive correlation between using the fun thinkers book and improving students' creative thinking abilities. According Agustina and Purwanti (2022) found that using fun thinkers book media in student learning enhances their creative thinking abilities. Comprehension of a concept is achieved through the processes of abstraction and the utilization of student imagination. Given the cognitive skills of elementary school students, engaging them in imaginative activities that utilize visually appealing images to capture their attention is necessary. Text-based descriptions are often less engaging for students than books with visual elements, resulting in lower interest in textbooks. Books that incorporate numerous illustrations, such as fun thinkers books, tend to capture students' attention more effectively.

Fun thinkers book is appropriate for elementary school students as it is engaging, calming, and enhances cognitive ability (Rahmah & Hidayat, 2022). Reducing the reliance on textbooks in elementary education can help alleviate student boredom. The primary distinction between a book by a fun thinker and a textbook lies in the arrangement and presentation of the book's content. Textbooks can maximize students' understanding of materials that contain many concepts (Pavesic & Cankar, 2022). Meanwhile, material about waste processing contains aspects of skills that students need to see concretely in the form of pictures. The descriptions will actually make it difficult for students to imagine waste processing activities.

The fun thinkers book utilizes visual aids to convey information, whereas traditional textbooks rely on written text to present the material. Images that are suitable for elementary school students are those that are easily understandable and foster interactive discussion (Wijaya et al., 2021; Jumanto & Prasetyo, 2015). Furthermore, it is imperative to consider the arrangement, layout, fonts, image size, and the relevance of the visuals to the content when designing book-shaped media (Kusno & Kusuma, 2018). The utilization of visual aids, such as pictures, to present information on waste management is very suitable as it facilitates the visualization of intricate processes and workflows, hence enhancing students' engagement and comprehension. The integration of fun thinking books into classroom instruction should be increased to improve elementary school students' educational achievements.

## CONCLUSION

Based on the study's findings, it is evident that there is a significant difference in the comprehension levels of elementary school students when exposed to interactive media, such as fun thinking books and traditional textbooks. The students who utilized the fun thinkers book exhibited a more comprehensive understanding of the topic of waste management compared to those who relied on the traditional textbook. The utilization of the fun thinkers books not only serves to stimulate students' creativity but also facilitates

an enhanced level of comprehension. This is primarily attributed to the incorporation of numerous visually engaging illustrations inside the book, effectively preventing children from experiencing boredom during the learning process. There is a need to decrease reliance on text-heavy textbooks in primary education, as pupils at this level continue to prefer visual aids and tangible materials strongly.

This research is limited to material about the stages of waste processing. The research with the object of the fun thinkers book can be further advanced through the implementation of development research aimed at designing Fun thinkers books that accommodate many appropriate themes. The selection of a theme should be appropriate in order to enhance student learning outcomes effectively.

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