

The Development of Matching Card Book in Improving Students' Vocabulary Mastery

Nissa Febrianti¹, Muh Shofiyuddin²

^{1,2}Universitas Islam Nahdlatul Ulama Jepara

211320000594@unisnu.ac.id¹, muh_shofiyuddin@unisnu.ac.id²

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Abstract

Vocabulary is a crucial element in mastering English language; however, many students struggle to learn it due to ineffective learning methods and lack of interesting media. This study aims to create an engaging Matching Card Book as an interactive print-based learning resource aimed at improving vocabulary mastery among seventh-grade students. This research employs the Research and Development (R&D) method, utilizing the ADDIE model, which encompasses the stages of Analysis, Design, Development, Implementation, and Evaluation. This media has received validation from both material and media experts with the result of "very feasible" both in terms of content and design. To test the effectiveness of the media quasi-experimental design was employed that included a non-equivalent control group. The findings showed that the Matching Card Book significantly improved students' vocabulary scores with the experimental group (average post-test 87.31) outperforming the control group (average post-test 75.31). The implication of this study suggests that interactive and visually engaging media can bridge the gap in vocabulary learning and serve as an effective alternative especially in educational environments that have limited technological resources. The Matching Card Book is proven to be an interesting, easy to use, and effective media in improving students' vocabulary mastery and promote more active student participation in English learning.

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INTRODUCTION

Mastering vocabulary is a crucial aspect of achieving language proficiency, serving as an important micro-skill in language acquisition that allows learners to express themselves clearly and understand others effectively (Muhayyang et al., 2023). In the context of English education in Indonesia and English curriculums, vocabulary knowledge is particularly vital especially in secondary school level, where students are expected to transition from basic to more advanced language use (Rashid et al., 2022). Students' reading comprehension, listening skills, and general communication ability are greatly contributed by their vocabulary knowledge (Amiruddin et al., 2025). A rich vocabulary not only enhances their understanding of texts but also enables them to articulate their thoughts and ideas with greater clarity and effectiveness in both spoken and written forms. But a large number of students continue to struggle with vocabulary acquisition as they were not exposed enough to the language and instructional methods to provide this knowledge have often been ineffective (Octaviani & Sari, 2022). Students' limited knowledge of English vocabulary also inhibits their reading comprehension, discussion participation, and formation of meaningful English sentences (Allen, 2023).

Vocabulary acquisition encompasses several key aspects, including word recognition, understanding word meaning, pronunciation, spelling, and the ability to use words contextually (Ghanem et al., 2023). Effective vocabulary learning should include a variety of techniques to address these aspects and improve long-term retention (Teng, 2022). Traditional methods, such as rote memorization and textbook-based learning, have been widely used but often fail to maintain student engagement (Masruddin & Nasriandi, 2022). Research shows that students need more interactive and meaningful learning experiences to improve vocabulary retention and application (Sarmila et al., 2023).

Based on the preliminary classroom observation indicated that seventh grade students in resource-limited school environments, particularly in rural areas, face persistent challenges in vocabulary learning. These include lack of engaging teaching materials and a continued reliance on monotonous teaching methods (Ye, 2023). Despite the incorporation of widely recognized digital tools (e.g., electronic dictionaries; gamification applications) in the field of vocabulary acquisition, its implementation still faces challenges due to the limited availability of technological resources in rural areas (Lai & Chen, 2023; Teng, 2022). Therefore, there is an urgent need for affordable, effective, and contextually appropriate learning media that can be widely applied without being constrained by access to technology.

The existing literature has explored various digital and visual interventions for vocabulary development, but there is still a lack of affordable and accessible non-digital learning tools for all learners. The repetitive exercises found in textbooks have not been successful in significantly capturing students' attention, leading to poor recall and minimal use of vocabulary in real-life situations (Octaviani & Sari, 2022). Furthermore, many studies have focused on high-tech

solutions, which may not be feasible for schools with limited digital infrastructure (Norahmi et al., 2024). This highlights the need for alternative approaches that combine interactivity with simplicity.

In overcoming these problems, this research will develop a Matching Card Book as a new educational tool for enhancing vocabulary mastery for seventh grade students. According to previous studies, matching card activities help facilitate learning by associations and through active engagement, also improve memory retention with visual reinforcement (Allen, 2023; Teng, 2022). This interactive method will be used for teaching vocabulary, making it easier and more fun for the students.

In response to this challenge, this study proposes the development of a Matching Card Book as an educational tool design to improve vocabulary mastery among seventh-grade students through engaging and practical activities, Matching card strategies have been proven to support learning through visual reinforcement, associative memory, and active participation (Allen, 2023; Teng, 2022). Unlike technology-based interventions, this tool can be implemented without reliance on digital resources, making it an ideal choice for under-resourced educational environments.

The novelty of this research lies in adapting the concept of matching card games into a structured vocabulary book based on the curriculum, which aims to increase students engagement and retention. Unlike previous studies that emphasize digital solutions, this research introduces interactive, cost-effective, and easily reproducible media that encourages vocabulary learning in context and supports diverse learning needs. The Matching Card Book serves as a bridge between traditional methods and modern pedagogical practices, offering a scalable and adaptable solution for various classroom settings.

This research aims to develop and evaluate the effectiveness of Matching Card Book as a vocabulary teaching aid at the junior high school level. The specific objectives are; to determine the effectiveness of Matching Card Book in improving students' vocabulary retention and usage; and to analyze the impact of interactive media on students' motivation and engagement in vocabulary learning.

By addressing instructional gaps in teaching and promoting cost-effective solutions, this research makes a meaningful contribution to vocabulary teaching methodology and offers practical implications for educators, curriculum designers, and policy stakeholders in resource-limited learning environments.

METHODS

In this research, the researcher has developed a resource known as the *Matching Card Book*, which combines a book format with flashcard. The *Matching Card Book* is a learning tool developed to support vocabulary acquisition in junior high schools. This book combines printed cards (visual) with a structured guidebook that organizes vocabulary into thematic units related to daily school

life. This tool is designed to enhance student engagement, memory retention, and contextual understanding of English vocabulary through practical learning and games.

The developed *Matching Card Book* consists of five chapters, in which each chapter introduces 10 nouns and 10 verbs based on themes related to school. Each card has a picture that students can match with the vocabulary listed in the book. Moreover, each chapter ends with an evaluation activity (e.g., matching words with pictures, crossword puzzles, etc. Each word is chosen based on its frequency of use, relevance to students' life, and alignment with the junior high school English curriculum. The themes and vocabulary examples can be seen in the following table:

Table 1. Themes and Vocabulary Examples

Chapter	Theme	Sample Vocabulary
1	Classroom	Whiteboard, Chair, Desk, Marker
2	Library	Bookshelf, Dictionary, Library card, Librarian
3	Canteen	Plate, Spoon, Cup, Cashier
4	Laboratory	Lab Coat, Test Tube, Microscope, Flask
5	School Supplies & Stationery	Backpack, Ruler, Scissors, Paperclip

This research employs the Research and Development (R&D) approach, utilizing the ADDIE model to create the *Matching Card Book* as an effective learning tool aimed at improving students' vocabulary mastery. Research and Development is a methodological approach focused on creating and evaluating the effectiveness of a specific product. In this study, the researcher opted for the ADDIE model, as it is particularly well-suited for the development of multimedia content that is grounded in English teaching materials (Ainun et al., 2023). This model featured straightforward phases and was user-friendly throughout the product development process. The ADDIE model consist of five key phases: Analysis, Design, Development, Implementation, and Evaluation (Khadijah & Rezeki, 2023). The ADDIE model is a systematic instructional development approach commonly used in educational media development (Salhab & Daher, 2023).

In the Analysis phase, the researcher conducted classroom observation, interviewed teacher, and reviewed student test results to identify vocabulary challenges. These findings were compared with curriculum requirements and vocabulary competency standards to determine instructional gaps and student learning needs.

During the Design phase, the Matching Card Book were compiled based on common school environments (e.g., classrooms, canteen). Each chapter contains ten nouns and ten verbs related to the theme, accompanied by picture cards. Evaluation Instrument, including pre-test, post-test, student questionnaires, and teacher interview guides, were developed and validated by experts to ensure content appropriateness and clarity (Chen et al., 2022).

In the Development phase, prototype was designed with student-friendly displays and language. Material and media experts are involved in content and design validation (Yan et al., 2024). Validation involved subject material and media experts used structured rubrics to assess appropriateness, clarity, and level of engagement. Revisions were made based on feedback from both subject material and media experts.

In the Implementation phase, the Matching Card Book is applied in vocabulary learning in the experimental class (7A). Meanwhile, the control class (7B) continued learning vocabulary through conventional text-book based methods. Teachers are trained in using the Matching Card Book as a teaching media (Luan et al., 2025). In order to ensure the continued use of the *Matching Card Book*, teacher needed to be trained in how to implement this media to ensure consistency and appropriateness in its use. The training covered: Introduction to the *Matching Card Book*; Instructions on how to facilitate each chapter's activities; and guidelines for conducting assessments and monitoring student engagement.

In the evaluation phase applied both formative and summative assessments. Formative assessments were conducted during the development stage, based on expert feedback. Summative assessments compared students' vocabulary performance before and after using the media, which is evaluated through post-test.

To assess the effectiveness of this media, a quasi-experiment with Nonequivalent Control Group Design will be employed (Anggoro et al., 2024). The quasi-experiment method is chosen because it enables a comparison of the learning outcomes between the experimental and control group without full randomization (Yan et al., 2024). This research conducted at Junior High School. There are four classes of seventh grade they are 7A, 7B, 7C, and 7D but the researcher chose 7A and 7B as samples:

- Experimental Class (7A): Using Matching Card Book developed with ADDIE model.
- Control Class (7B): Using conventional methods in vocabulary learning.

Tabel 2. Research design table

Class		Pre-Test	Treatment	Post-Test
1	7B (Control)	o1	- (Conventional Method)	o2
2	7A (Experimental)	o1	X (Matching Card Book)	o2

Explanation:

- o1 = Pre-test before treatment
- X = Treatment using the Matching Card Book based on the ADDIE model
- o2 = Post-test after treatment

Furthermore, to evaluate the effectiveness of the Matching Card Book, this study utilizes three main data collection methods. First, a test (pre-test and post-test) was administered to measure students' vocabulary improvement before and after using the media. The test consisted of 25 multiple-choice items, each accompanied by a picture related to the school theme. Second, a questionnaire was distributed to gather student feedback on the clarity, usefulness, engagement level, and instructional value of the Matching Card Book. This tool included several open-ended questions. Third, an interview was conducted with the English teacher involved in the study to gain qualitative insights into the implementation process, student engagement, and observed improvements.

RESULTS AND DISCUSSION

RESULTS

This study aims to develop and evaluate the effectiveness of *Matching Card Book* media in improving vocabulary mastery among seventh-grade junior high school students. To achieve this goal, the research employs a Research and Development (R&D) approach, following the systematic ADDIE model, which consists of five essential phases: Analysis, Design, Development, Implementation, and Evaluation.

Analyzing the Students' Competence

To assess effectiveness of the created media, the study involved two groups of students in an experimental class and a control class, each comprising 35 participants. The data collection was conducted through two measurement stages: a pre-test and a post-test. Hypothesis testing was then performed using an independent samples t-test to determine whether there was a significant difference in vocabulary mastery between the experimental and control groups before and after the intervention utilizing the *Matching Card Book* learning media.

Before the implementation of learning, students from both classes were given an initial test (pre-test) to assess their foundational proficiency in English vocabulary. the results of the pre-test are presented in the table below:

Table 3. The results of the pre-test

Group Statistics					
	Class	N	Mean	Std. Deviation	Std. Error Mean
Result	1	35	69.83	12.323	2.083
	2	35	41.49	14.811	2.504

Table 3 presents the results of the pre-test conducted in two different classes. Class 1, which consisted of 35 students, achieved a mean score of 69.83 with a standard deviation of 12.323 and a standard error of 2.083. In contrast, Class 2, also comprising 35 students, had a significantly lower mean score of 41.49, with a standard deviation of 14.811 and a standard error of 2.504. These results indicate that, prior to the intervention, Class 1 had a notably higher level of vocabulary mastery compared to Class 2.

Designing the Media

The Design stage is the main part of the Matching Card Book media development process. At this stage, the initial product design is based on visual learning theory and dual coding. The product is designed with an attractive appearance, child-friendly illustrations, and a layout that makes it easy for students to understand vocabulary.



Figure 1. Book Cover



Figure 2. Start Cover in each Chapter

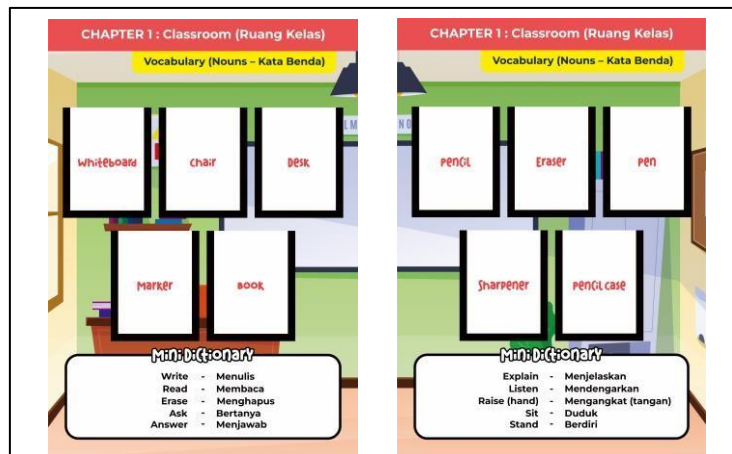


Figure 3. Chapter 1 (Classroom)

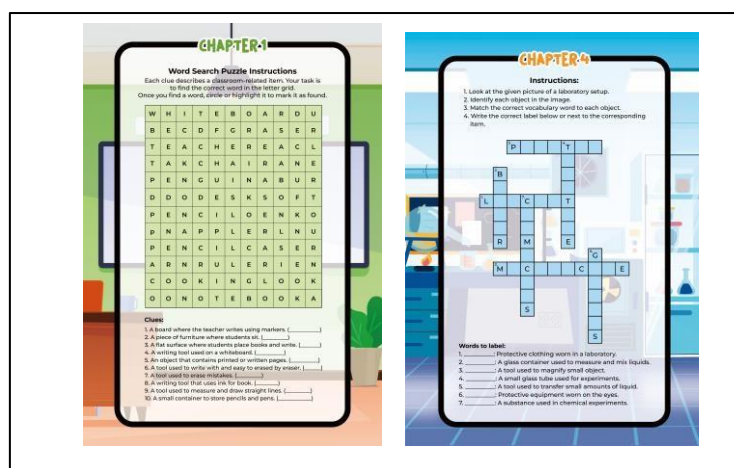


Figure 4. Evaluation of several Chapters



Figure 5. Design of the cards

Implementing the Media and Material

After the initial design process was completed, the validation process was conducted by two experts to ensure the media's feasibility, focusing on both content and visual design. Validation was conducted by material and media experts using structured assessment instruments. The outcomes of validation process are displayed in the table below:

Table 4. Recapitulation of Material Expert and Media Expert Validation Results

Assessment Aspect	Maximum Score	Material Expert Score	Media Expert Score
Clarity of Topic and Accuracy of Content	4	3	-
Language Structure and Ease of Understanding	4	4	-
Usefulness of Media	4	4	-
Layout and Color	4	-	4
Illustration and Visualization	4	-	3
Font Size and Type	4	-	4
Total Score Obtained	24	11 (91.7)	11 (91.7)
Total Percentage		22 (91.7%)	
Feasible Category		Highly Feasible	Highly Feasible

The validation results indicate that the media has successfully met standards for content and design feasibility to be used in the learning process in class. After the Matching Card Book media was applied for several meetings in the

experimental class, a final assessment known as post-test, was carried out to evaluate the enhancement of learning outcomes. Below are the statistical results from the post-test:

Table 5. The results of the post-test

Group Statistics					
	Class	N	Mean	Std. Deviation	Std. Error Mean
Result	1	35	75.31	8.811	1.489
	2	35	87.31	6.685	1.130

The result of the t-test yielded a score of $t = -6.419$ was obtained, with significance level (2- tailed) of 0.000. This indicates that there is a notable difference between the experimental class and the control class after treatment. The experimental class showed an impressive increase of 17.48 points from the pre-test to post-test, whereas the control class only experienced an increase of 33.82 points. Although the experimental class demonstrated a greater increase, highlighting the effectiveness of the media used in this group.

DISCUSSION

Analysis Stage

At the Analysis stage, the researcher examined the learning conditions in seventh- grade of Junior High School especially in English subjects. Drawing on the findings from observations, interviews with teachers, and the initial assessments (pre-tests), it was found that most students had difficulty in remembering new vocabulary. Teaching methods that tend to be conventional, such as lectures and memorization, cause students to get bored quickly and lack motivation. This discovery aligns with the research conducted by Harahap et al., (n.d.), that stated about learning media involving visual interaction and activities such as matching games can improve students' memory and motivation. By recognizing this initial condition, media was developed to fill the void of interesting and contextual learning methods.

Table 6. Recapitulation of the Pre-test Result

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Diff	95% Confidence Interval of the Difference	
								Lower	Upper
Results Equal									
variances assumed	.351	.556	8.703	68	,000	28.343	3.275	21.844	34.842
Equal variances not assumed			8.703	65.822	,000	28.343	3.275	21.840	34.846

Based on the result of Independent Samples t-Test for the pre-test indicate that Levene's Test for Equality of Variances shows a significance value of 0.556, which exceeds the threshold of 0.05. This indicates that there is no substantial difference in variances between the two groups, thereby confirming that the assumption of equal variances holds true. Referring to the row labeled "Equal variances assumed," the t-test for equality of means yielded a t-value of 8.703, with 68 degrees of freedom and a two-tailed significance value of 0.000. Since the p-value is less than 0.05, we can confidently conclude that there is a statistically significant difference between the means of the two groups. The observed mean difference is 28.343, accompanied by a standard error of 3.275. Additionally, the 95% confidence interval for this difference ranges from 21.844 to 34.842, indicating that the true mean difference is likely to lie within this range. These results suggest that the treatment or condition applied to one of the groups had a significant effect, leading to a substantially higher mean score compared to the other group.

Design Stage

During design stage, researchers designed the Matching Card Book media with student-centered principles. This media contains color illustrations and the book is also equipped with a mini dictionary to help students recognize verbs that can be applied in the school environment. This design refers to the research of Melliana & Diana (2024), which showed that ADDIE-based media design that pays attention to aesthetic and functionality factors can increase students' interaction with the material more actively.

Therefore, the media is designed to be not only visually appealing but also user-friendly for teachers and students during their daily learning activities. The Matching Card Book is designed in a picture book format, consisting of five

chapters, each focusing on vocabulary related to the theme "Let's Go to School." Each chapter presents vocabulary in the form of visual cards, featuring color picture illustrations alongside English words in a box. To reinforce learning, evaluation activities are included in each chapter. Additionally, the product is designed to be portable and flexible, making it suitable for group learning, individual study, or self-study at home. According to Riki et al., (2023), a pleasant visual design can form emotional engagement that is important in the learning process of students, especially in game-based print media. With this principle, the Matching Card Book design not only considers aesthetic value, but also educational functions.

Development Stage

The validation results of the Matching Card Book media indicated a very high level of feasibility as assessed by both material and media expert.

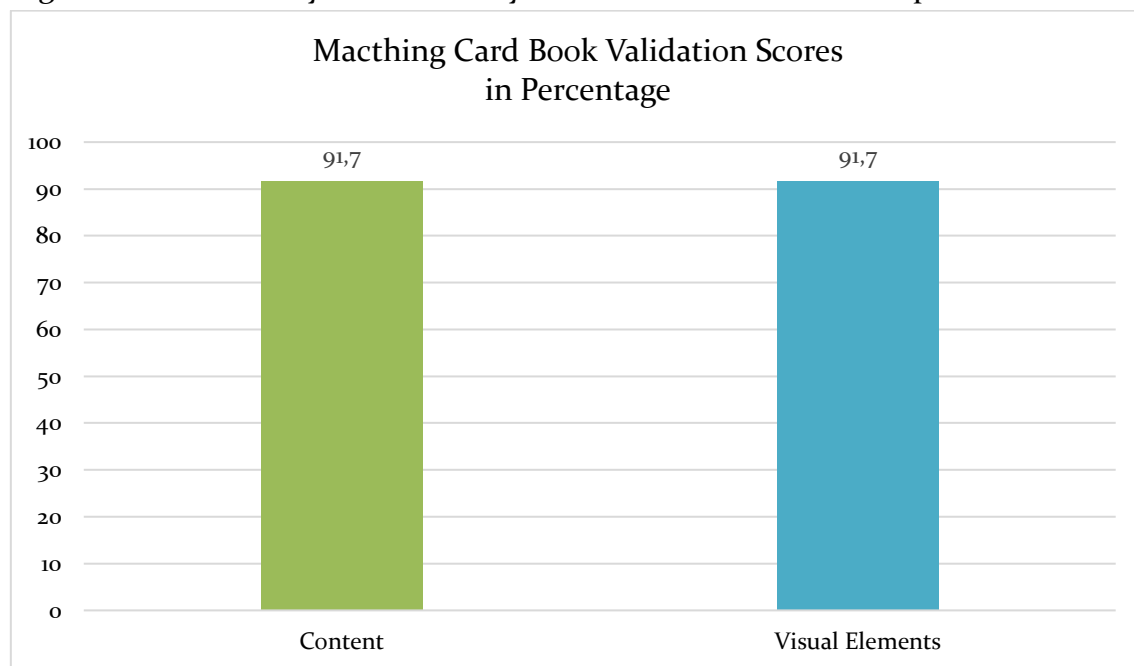


Figure 6. Diagram of Material and Media Expert

As shown in Table 4, both experts provided a perfect score (91.7%) for all assessed aspects. The material expert confirmed that the content of the media aligns with the curriculum and effectively supports students in achieving vocabulary mastery. This evaluation highlight that the material is not only academically appropriate but also linguistically accessible for junior high school students. On the other hand, the media expert gave a "Very Good" rating to visual elements such as illustrations, layout, and color combinations. This supports the relevance of Dual Coding Theory (Paivio, 1990), which emphasizes that the combination of verbal and visual input enhances comprehension and memory

retention. The absence of any revision notes from both experts further demonstrates that the *Matching Card Book* meets the expected quality standards in both content and design. These findings are consistent with Cahyana et al. (2024), who state that expert validation plays a vital role in ensuring the quality and practical usability of learning media before it is implemented in the classroom.

Implementation Stage

At the implementation stage, *Matching Card Book* was implemented in the experimental class for three meetings. The learning process was facilitated by the researcher using an interactive approach combined with group-based games. During the session, students actively engaged with the media by matching picture and word cards and creating simple sentences using the vocabulary they had learned. This hands-on activity not only improves vocabulary recall, but also encourages collaboration and critical thinking. The post- test results showed a significant increase in students' vocabulary acquisition in the experimental group. This finding aligns with the work of Yulianti et al., (2025)research, which found that word-matching games effectively Improve vocabulary retention, mainly because these games emotionally and cognitively engage students in the learning process.

Table 7. Recapitulation of the Post-test results

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2- tailed)	Mean Differenc e	Std. Error Diff	95% Confidence Interval of the Difference	
								Lower	Upper
Results Equal variances assumed	4.098	.047	-6.419	68	,000	-12.000	1.869	-15.731	-8.269
Equal variances not assumed			-6.419	63.4 02	,000	-12.000	1.869	-15.735	-8.265

The results of the Independent Samples t-Test performed on the post-test indicate a noteworthy finding from Levene's Test for Equality of Variances, which yielded a significance value of 0.047 below the critical threshold of 0.05. This result demonstrates a significant difference in variances between the two groups, thus invalidating the assumption of equal variances. As a result, we must refer to the section labeled "Equal variances not assumed" for our interpretation of the results. In this part of the analysis, the t-test for equality of means shows a t-value of -6.419, with 63.402 degrees of freedom and a significance (2-tailed) value of 0.000.

Given that this p-value is significantly less than 0.05, it can be confirmed the presence of a statistically significant difference in the means of the two groups. The mean difference is assessed at -12.000, accompanied by a standard error of 1.869. Notably, the 95% confidence interval for this difference ranges from -15.735 to -8.265, suggesting that the true mean difference is likely to be found within this interval. The negative mean difference points to the fact that the second group achieved a considerably higher mean score than the first group.

The comparison of the pre-test and post-test results indicates that, despite initial discrepancies observed in the pre-test, the differences identified observed in the pre-test, the differences identified in the post-test were significantly larger and more pronounced, leading to the success of the treatment given to the first group. The significant increase in scores indicates that the treatment was effective in improving students' learning outcomes. Therefore, the treatment or method applied to the first group proved to have a positive and significant effect on improving students' ability or understanding.

Evaluation Stage

At the evaluation stage of the learning media development process, a combination of instruments was employed to assess the effectiveness of the Matching Card Book. These included a post-test to measure students' vocabulary gains, teacher reflection to gather pedagogical insights, and student questionnaires to understand learner perceptions. The post-test results indicated a clear improvement in vocabulary mastery among students who used the media, suggesting that the product successfully addressed the gap in engaging vocabulary learning tools. This quantitative evidence was crucial in validating the practicality and instructional value of the developed media.

Qualitative data obtained from student questionnaires further reinforced these findings. A significant majority of students expressed positive attitudes toward the use of the Matching Card Book, stating that it made learning vocabulary more enjoyable and interactive. They described the learning experience as not only fun and challenging but also effective in helping them remember word meanings. The game-like structure and visual elements of the cards appeared to promote active engagement and foster intrinsic motivation to learn. These aspects are particularly important in vocabulary acquisition, as retention and repeated exposure are key components of long-term learning.

Teacher reflections echoed students' responses, emphasizing observable improvements in classroom dynamics. Educators noted an increase in student participation, greater cooperation during group activities, and enhanced accuracy in vocabulary usage across both oral and written tasks. The media also encouraged

students to be more confident and autonomous in their learning. These observations align with the study conducted by Hardiyanti and Herda (2023), which highlights the benefits of card-based visual learning tools in fostering interaction and improving vocabulary comprehension, particularly among junior high school learners. Such media are developmentally appropriate for students in the concrete operational stage, who benefit most from visual, hands-on, and contextualized learning strategies.

CONCLUSION

Based on the results and discussion presented in this research, the study concludes that the development and implementation of Matching Card Book significantly improves students' vocabulary mastery at junior high school level. Developed using the ADDIE model, this media met the need for an engaging and accessible vocabulary learning tool, especially in contexts with limited access to digital resources.

Statistical analysis of pre-test and post-test scores shows that students in experimental group who used Matching Card Book achieved higher learning outcomes compared to those taught using conventional methods. This effectiveness was supported by validation from material and media experts, as well as positive feedback from students and teachers.

Additionally, the Matching Card Book promotes active, student-centered learning by integrating visual aids and interactive tasks, which contribute to increased motivation, engagement, and vocabulary retention among students. Its practical application in the classroom highlights its potential as an effective learning tool across various educational settings.

Although the results are promising, this study is limited to one school with a relatively small sample size, which may affect the generalizability of the findings. Further research is recommended to explore the long-term impact of card-based matching media, evaluate its adaptability across different grade levels, and compare its effectiveness with other interactive vocabulary learning tools.

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