

The Effectiveness of Interactive Snakes and Ladders Game to Improve Arabic Vocabulary Mastery

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Abstract

This study aims to evaluate the effectiveness of Snakes and Ladders-based learning media in improving students' mastery of Arabic vocabulary. Traditional methods like textbooks and static visual aids often fail to engage students actively and ensure consistent vocabulary retention. To address this, the study applied a pre-experimental design with a quantitative approach, using a one-group pretest-post-test format. The intervention involved a life-sized Snakes and Ladders board placed on the classroom floor, where students physically moved as game pieces and answered vocabulary prompts at each square—this setup aimed to provide an interactive learning experience, reinforcing vocabulary through repetition and contextual application. The study involved 18 fourth-grade students, with an initial average pretest score of 71.61, which increased to 94.11 in the Post-test, showing an improvement of 22.50 points. A paired t-test revealed a statistically significant improvement ($t(17) = -12.144$, $p < 0.001$), with Cohen's $d = 3.79$, indicating a substantial impact. These results demonstrate that Snakes and Ladders game-based learning can significantly enhance vocabulary acquisition. Incorporating physical movement, peer interaction, and visual stimuli is vital in reinforcing vocabulary retention, offering a promising alternative teaching method to support Arabic language learning at the elementary level.

Keywords

Educational Media; Game-based Learning; Interactive Learning; Arabic Vocabulary; Snakes and Ladders

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1. INTRODUCTION

In the present era, education plays a crucial role in human life, particularly for personal development. It serves as a fundamental tool in shaping and improving the quality of human resources (Lesmana et al., 2022). One sector of education that has witnessed significant growth is language education, especially in teaching foreign languages. English has experienced considerable development in Indonesia, while other foreign languages, such as Mandarin, French, and Arabic, have also garnered increasing attention. Arabic, in particular, is prominent in Islamic educational institutions, systematically integrating from kindergarten (*Raudhatul Athfal*) to higher education (Kuliyatun et al., 2023).

Given its widespread adoption, Arabic instruction has become a fundamental aspect of these



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institutions. It includes three main components: linguistic elements, language skills, and cultural understanding. The linguistic components include grammar (*qawa'idu al-lughah*), vocabulary (*mufradat*), as well as pronunciation and spelling (*ashwat 'arabiyyah*) (Akashtia & Indriyani, 2024). Among these, vocabulary mastery is particularly significant as it underpins all language skills, including listening, reading, writing, and speaking (Fadila et al., 2025). A strong vocabulary foundation enhances comprehension and improves the ability to communicate effectively in Arabic.

The Indonesian Ministry of Religious Affairs has formulated specific regulations concerning including Arabic as an academic subject. According to the Ministerial Decree (KMA) No. 183 of 2019, Arabic is categorized as a language subject aimed at fostering, guiding, developing, and nurturing students' skills and positive attitudes toward Arabic, encompassing receptive and productive aspects. Receptive ability refers to language skills that enable individuals to receive and comprehend information delivered by others, whether in spoken or written form. On the other hand, productive ability involves language skills used to articulate information or ideas verbally and in writing (Taubah & Dhaifi, 2020).

In line with this policy, Arabic language learning not only focuses on linguistic aspects but is also a communication process that involves interaction between learning resources, teachers, and students (Syarovina et al., 2024). However, communication deviations often occur in practice, making the learning process ineffective and inefficient. These errors can be caused by a lack of attention and low interest in learning from students (Yunisa, 2022). One way to overcome this problem is to utilize the media in the learning process because the media acts not only as a presenter of information but also helps to increase harmony in understanding information. In addition, the media can also function to organize developmental steps and provide helpful feedback (Listianingsih, 2023).

The word media comes from medium, which means connector. In Arabic, media comes from the word وسائل (*wasail*), which also has the meaning of "intermediary" or "introduction". Meanwhile, learning is a teaching effort that organizes student learning activities (Prananingrum et al., 2020). Choosing the right learning media requires in-depth analysis by considering various aspects and certain principles, so the media used is high quality and by the learning objectives. According to Komala Dewi (2023), learning media must fulfil several main principles: effectiveness in achieving learning outcomes, relevance to material and student needs, and efficiency in using time, cost, and energy. In addition, the media should be easy to use and contextual so that it is accessible and relevant to the student's learning environment. Applying these principles allows the learning process to occur more optimally and effectively.

Snakes and Ladders learning media is one of the interactive methods that can be used in the learning process. The game, traditionally used for recreational purposes, involves two or more players using dice to move across a board marked with snakes and ladders (Wati, 2021). Recent developments have seen this game adapted as an educational tool, combining gameplay mechanics with instructional objectives to foster a more engaging and less monotonous learning experience (Dewi et al., 2024; Rafidah et al., 2024). This transformation supports student-centered learning by enhancing enjoyment and reducing reliance on conventional, worksheet-based activities.

Implementing the Snakes and Ladders game in educational settings brings multiple benefits. This media not only provides a more real learning experience but also allows students to learn while playing in a fun way, and no longer fixated on the question sheet. In addition, this game can increase student motivation in learning, hone critical thinking skills through challenges in the game, and foster cooperation in groups (Saputri et al., 2022). Compared to previous learning media, Snakes and Ladders proves more effective in promoting active student participation, as they have to interact with the game board and fellow players. Attractive visual displays, such as the use of bright colours and informative illustrations, also increase students' enthusiasm for learning (Setiawati et al., 2019). With the various advantages offered, the Snakes and Ladders game is the right choice as an interactive learning medium

to improve students' vocabulary mastery effectively.

Researchers have highlighted that using innovative media in language instruction significantly improves learners' motivation and academic outcomes. Rini & Abdullah (2020) Conducted a relevant study by developing Arabic language learning multimedia based on visual learning. Their findings show that interactive multimedia design improves students' engagement, concentration, and proficiency in Arabic. These results strengthen the idea that interactive visual media encourages active participation in the learning process. In contrast, the present study takes a different approach by integrating educational game media as a learning tool. This approach aims to provide a novel and enjoyable alternative for enhancing mastery of Arabic vocabulary (*mufradat*).

This game-based approach is grounded in the findings of Lei & Reynolds (2022), who studied word cards in English vocabulary learning, provided a relevant theoretical foundation for developing game-based instructional media. Their findings indicate that pre-designed printed word cards significantly outperform self-made or digital alternatives, particularly in structured and intensive learning environments with higher proficiency learners. While their research focused on English, the principles support the potential effectiveness of well-structured, game-based learning media in Arabic vocabulary instruction. Both studies collectively emphasize the importance of deliberate design and immersive engagement for successful vocabulary learning.

Further support for game-based learning can be seen in Muthmainnah et al. (2024) Offers valuable insights for this study, especially in demonstrating the positive impact of educational games on Arabic language learning. Their results suggest that using games as a learning tool significantly enhances students' vocabulary mastery. This method outperforms traditional teaching techniques for helping students grasp and retain new words. The study also underscores the importance of making learning interactive and enjoyable, as this approach helps boost students' memory retention. Based on their findings, they recommend carefully designing game-based learning media that aligns with students' comprehension levels, fostering a more engaging and meaningful learning experience.

A related study by Istaqam (2021) Also examined the use of educational games in language learning and remains relevant to this research, as both applied a Snakes and Ladders-based learning strategy to enhance Arabic language competence. Although both studies employed a similar approach, Istaqam's study focused more specifically on developing students' writing skills. The results indicated that the Snakes and Ladders game increased students' interest in writing by integrating learning with enjoyable play activities. This student-centered learning model encouraged students to be active, creative, and directly engaged in the learning process. However, the method's effectiveness appeared limited among students with low vocabulary mastery, who struggled to complete the given tasks. Therefore, this current study focuses on strengthening vocabulary mastery as the foundational step before progressing to other language skill developments. Doing so aims to support students' advancement in more complex aspects of language learning.

Conducted a study on the use of giant board games in Arabic language learning, which aligns with the present research, particularly emphasizing the importance of innovative teaching methods through game-based approaches (Noormalasari et al. 2023). Their study highlighted that, compared to conventional methods such as textbook use, giant board games offer a more interactive and engaging learning experience, increasing student involvement and enhancing vocabulary mastery more effectively. These findings serve as a crucial foundation for developing this research, which adopts the Snakes and Ladders game as a learning medium. By integrating elements of strategy and challenge, the Snakes and Ladders game is considered effective in strengthening students' vocabulary retention and fostering a more active, structured, and meaningful learning environment.

While prior studies have shown that games can improve various Arabic language skills, few have specifically examined the combination of visual and physical elements in educational games to reinforce vocabulary. This research fills that gap by introducing an innovative modification of the Snakes and

Ladders game that uses a giant board where students act as game pawns and incorporates visual cues in each box to represent specific vocabulary. This dual approach, which combines kinesthetic and visual learning strategies, is designed to maximize student interaction, reinforce memory through association, and create a fun and meaningful learning experience.

Based on this rationale, the novelty of this study lies in integrating a physically immersive and visually reinforced Snakes and Ladders game to improve students' vocabulary mastery. Unlike previous research, this study emphasizes combining motion-based and image-based learning strategies to enhance recall and participation. Therefore, this research focuses on examining the effectiveness of the modified Snakes and Ladders game in improving students' vocabulary mastery in Arabic learning at SD Islam Athirah Racing Centre, to evaluate whether the use of a giant board and visual elements in the game can significantly enhance Arabic vocabulary acquisition among elementary school students.

2. METHODS

This study employed a pre-experimental quantitative design using a One-Group pretest–Post-test model (Zulfa et al., 2023). Experimental quantitative research aims to administer treatment within a defined scope to evaluate its impact on the studied variables (Sugiyono, 2018). In this research, the researchers compared the participants' performance before and after implementing a Snakes and Ladders game-based learning media. The design is illustrated in Table 1.

Table 1. Research design: One-group pretest-post-test design

Subject	Pretest	Treatment	Post-test
Fourth-grade students	O ₁	X	O ₂

Notes: O₁ indicates pretest, X indicates treatment, and O₂ indicates Post-test.

The population in the study was fourth-grade students of SD Islam Athirah Racing Centre, totalling 18 participants, making saturated sampling the most suitable method, whereby the entire population is included as the sample. The research instrument consisted of 30 multiple-choice questions to measure students' mastery of Arabic vocabulary. These questions were constructed based on indicators aligned with the learning objectives and curriculum standards for fourth-grade language acquisition. The instrument was administered twice, once before the treatment and once after, to identify the students' baseline understanding and vocabulary limitations. In contrast, the Post-test evaluated the extent of vocabulary improvement after exposure to the game-based learning strategy. Both tests were conducted under the same conditions to maintain consistency and reduce testing bias.

Before further analysis, the instrument underwent a thorough validation and reliability process to ensure the accuracy and consistency of the collected data. The concepts of reliability and validity are essential in the creation and validation of research tools. Validity refers to how accurately an instrument measures what it is intended to measure, while reliability concerns the consistency and stability of the measurement results (Khanal & Chhetri, 2024). An Arabic language lecturer and a fourth-grade Arabic teacher determined content validity through expert evaluation, which assessed all items for clarity, relevance, and alignment with curriculum standards. Additionally, item (empirical) validity was evaluated through trial testing with students. Pearson's product-moment correlation was applied to examine the relationship between each item and the total test score, with items showing correlation coefficients above the minimum threshold being retained.

To evaluate the instrument's internal consistency, Cronbach's alpha was utilized for reliability testing (SÜRÜCÜ & MASLAKÇI, 2020). A reliability coefficient (α) of 0.70 or higher was deemed acceptable, confirming that the items reliably measured the intended construct of vocabulary mastery. The combination of content, empirical validity, and strong reliability ensured the instrument's psychometric soundness.

Following the validation of the instrument's psychometric properties, the researchers conducted a descriptive statistical analysis to investigate overarching trends in student performance. This analysis encompassed measures such as the mean, median, standard deviation, minimum, and maximum scores (Guetterman, 2019). These statistical indicators provided a comprehensive overview of students' academic outcomes and facilitated the identification of potential outliers within the dataset.

To determine whether the data met assumptions required for further parametric analysis, the researchers applied a normality test to both pretest and Post-test results. Given that the sample size was under 50, the Shapiro-Wilk test was selected due to its sensitivity and suitability for small datasets (Mishra et al., 2019). If the normality test results indicated that the data were normally distributed, this would validate the use of paired sample t-tests in assessing whether the differences between pretest and Post-test scores were statistically significant.

In addition to assessing statistical significance, the study also evaluated the magnitude of the treatment effect by calculating Cohen's d. This measure of effect size provides a practical interpretation of the observed differences, offering insights into the real-world relevance of the intervention beyond the limitations of statistical significance alone. The formula employed for this calculation is as follows:

$$d = \frac{X_{\text{post}} + X_{\text{pre}}}{SD_{\text{pooled}}}$$

Where:

X_{post} = Post-test average

X_{pre} = pretest average

SD_{pooled} = the pooled standard deviation calculated by the formula:

$$S_p = \sqrt{\frac{(n_{\text{pre}}-1)S_{\text{pre}}^2 + (n_{\text{post}}-1)S_{\text{post}}^2}{n_{\text{pre}} + n_{\text{post}} - 2}}$$

Description:

S_p = Pooled Standard Deviation.

n_{pre} = Number of samples in the pretest group.

n_{post} = Number of samples in the Post-test group.

S_{pre}^2 = Variance (square of standard deviation) of the pretest group.

S_{post}^2 = Variance (square of standard deviation) of the Post-test group.

The interpretation of Cohen's d value adheres to the general guidelines, where $d < 0.2$ represents a small effect, $0.2 \leq d < 0.5$ indicates a medium effect, and $d \geq 0.8$ denotes a large effect (Cohen et al., 2017). Therefore, this analysis evaluates statistical significance and quantifies the strength of the Snakes and Ladders game's impact on improving students' vocabulary acquisition.

3. FINDINGS AND DISCUSSIONS

Findings

Researchers first conducted a validity test to ensure the accuracy and consistency of the research instruments in measuring students' vocabulary mastery. The validity test is crucial in determining whether the instrument measures what it is intended to measure (Connelly, 2022). This study aimed to assess students' vocabulary mastery, and the test used was the Pearson Product-Moment correlation. A question was considered valid if the r-count exceeded the critical r-table value of 0.361. Among the 30

questions tested, 21 were found valid, while nine were deemed invalid. This finding confirms that most of the items in the instrument successfully measure vocabulary mastery, while a small portion did not meet the necessary validity threshold. The invalid items were excluded from further analysis to ensure only reliable data were considered. The results of the validity test are presented in Table 2 below:

Table 2. The Results of the Validity Test

Result	Number of Questions	Question Number
Valid	21	1, 2, 3, 5, 6, 7, 10, 11, 12, 13, 15, 17, 19, 21, 22, 25, 26, 27, 28, 29, 30
Invalid	9	4, 8, 9, 14, 16, 18, 20, 23, 24

Once the validity of the items was confirmed, researchers proceeded with a reliability test to evaluate the instrument's internal consistency. The reliability test is essential to ensure the instrument produces consistent results when repeated under similar conditions (Amirrudin et al., 2020). In this study, Cronbach's Alpha was used to assess reliability. Cronbach's Alpha values range from 0 to 1, with $0.7 \leq \alpha < 0.8$ values considered acceptable for ensuring internal consistency (Wijaya & Kloping, 2021). The reliability test revealed a Cronbach's Alpha value of 0.862 for the 21 valid items, indicating high internal consistency and suggesting that the instrument reliably measures the students' vocabulary mastery across different groups. This high value indicates that the instrument can be trusted to provide stable and consistent results, reinforcing the robustness of the data collection process. The results of the reliability test are shown in Table 3 below:

Table 3. The Results of the Reliability Test

Cronbach's Alpha	N of Items
.862	21

These validity and reliability results provide strong evidence that the research instrument used in this study is accurate and consistent, making it suitable for further analysis of students' vocabulary mastery.

With the instrument validated and proven reliable, the researchers proceeded to analyze the pretest and Post-test data to assess the effectiveness of the learning media. The following section presents descriptive data from the pretest and Post-test analysis, as summarized in Table 4.

Table 4. The Results of Descriptive Statistics

Descriptive statistics					
	N	Minimum	Maximum	Mean	Std. Deviation Statistic
Pretest	18	60	83	71.61	7.237
Post-test	18	87	100	94.11	4.227
Valid N (listwise)	18				

Based on the descriptive statistical analysis shown in Table 4, students' average scores improved after undergoing treatment with the Snakes and Ladders learning media. The pretest mean score was 71.61, with a minimum of 60 and a maximum of 83. Following the implementation of the learning media, the Post-test mean score increased to 94.11, with a minimum of 87 and a maximum of 100. This increase in the mean score indicates the intervention's success and reflects a substantial improvement in students' engagement and vocabulary retention through an interactive learning approach.

Moreover, the pretest standard deviation of 7.237 reflects the variation in students' initial understanding of Arabic vocabulary. After the intervention, the Post-test standard deviation declined

to 4.227, indicating more consistent learning outcomes among students. The reduction in standard deviation suggests that the learning media not only improved individual performance but also contributed to narrowing the achievement gap among students. This progress suggests that the Snakes and Ladders learning media contributed positively to the mastery of Arabic vocabulary among fourth-grade students at SD Islam Athirah Racing Centre. Additionally, the researchers performed a normality test to assess whether the collected data followed a normal distribution. The results of this test are presented in Table 5.

Table 5. The Results of the Normality Test

Test of Normality			
Shapiro-Wilk			
Class	Statistic	Df	Sig
Pretest	.925	18	.215
Post-test	.915	18	.107

The normality test results conducted using the Shapiro-Wilk method indicate that the significance value (Sig.) for the pretest is 0.215, and for the Post-test, it is 0.107. Since both significance values exceed 0.05, the residuals can be considered normally distributed, allowing us to conclude that the variables meet the normality assumption (Rodriguez-Clare & Dingel, 2021).

After ensuring the data's normality, the next stage in this study is to conduct a t-test to assess the significance of the difference between the pretest and Post-test results. The results of the paired sample test are presented in Table 6 below

Table 6. The Results of the Independent Sample T-Test

Paired Samples Test								
				95% Confidence Interval of the Difference		<i>t</i>	<i>df</i>	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1 Pretest-Post-test	-22.500	7.861	1.853	-26.409	-18.591	-12.144	17	.000

The Paired Sample T-Test criterion depends on the Sig. (2-tailed) value. If the Sig. (2-tailed) A value below 0.05 indicates a significant difference between the conditions before and after applying a method or treatment. On the other hand, if the Sig. (2-tailed) value exceeds 0.05, no significant difference is observed (Yani & Tirtoni, 2024).

The results presented in the table indicate that the Paired Sample T-Test yielded a Sig. (2-tailed) value of 0.000, which is below the threshold of 0.05. Furthermore, the t-count value of -12.144 surpasses the t-table value of ± 2.110 ($df = 17$, $\alpha = 0.05$). These findings highlight a statistically significant difference between the pretest and Post-test scores after implementing the Snakes and Ladders game-based learning media. In light of the notable improvement in students' vocabulary mastery after the intervention, the study concludes that the Snakes and Ladders game is an effective tool for enhancing vocabulary acquisition.

After performing the paired t-test to assess the significance of the score differences, the researchers also analyzed the effect size using Cohen's d formula. This calculation aimed to measure the impact of the interactive Snakes and Ladders game on students' vocabulary mastery. They determined the effect

size by comparing the mean difference between the Post-test and pretest scores against the pooled standard deviation, calculated using the following formula:

$$\begin{aligned}
 S_p &= \sqrt{\frac{(18-1)(7.237)^2 + (18-1)(4.227)^2}{18+18-2}} \\
 S_p &= \sqrt{\frac{(17 \times 52.38) + (17 \times 17.87)}{34}} \\
 S_p &= \sqrt{\frac{890.46 + 303.79}{34}} \\
 S_p &= \sqrt{\frac{1194.25}{34}} \\
 S_p &= \sqrt{35.12} \\
 S_p &\approx 5.93
 \end{aligned}$$

Next, calculate the value of d :

$$\begin{aligned}
 d &= \frac{94.11-71.61}{5.93} \\
 d &= \frac{22.50}{5.93} \\
 d &\approx 3.79
 \end{aligned}$$

An effect size of 3.79 is considered extremely high, which implies that the intervention had a robust and consistent influence on students' vocabulary development. In educational research, such a value indicates transformative potential in instructional design.

Discussion

This study involved grade 4 students at SD Islam Athirah Racing Centre. It employed a group Pretest-Post-test design to test the effectiveness of Snakes and Ladders game-based learning media in improving students' vocabulary mastery. The research progressed through three stages: pretest, treatment, and Post-test. In the pretest stage, researchers gave students multiple-choice questions to measure their initial level of vocabulary mastery before the intervention. This stage played a crucial role in establishing a baseline of students' abilities, providing an empirical reference point for measuring improvement after the intervention. They used the data from this stage as a basis for comparison to assess the effectiveness of the applied method.

During the treatment stage, researchers implemented learning activities using the Snakes and Ladders game as the primary intervention medium. They presented the game in a large size, placing the game board on the classroom floor while students acted directly as pawns. According to Ratnaningsih (as cited in Marcela et al., 2022). The Snakes and Ladders game serves as a learning tool that integrates elements of play and learning simultaneously and stimulates students' thinking, creativity, and language skills. The interactive approach in this game creates a more interesting and enjoyable learning environment and fosters cooperation skills in groups, thus increasing the overall learning effectiveness. The activity engaged multiple learning modalities, which are known to enhance cognitive retention, by involving physical movement, group competition, and visual representations of vocabulary.

Before the game started, the researcher explained the rules and the learning objectives students needed to achieve. The game takes place in groups, with each group consisting of three to four students

competing against other groups. Each box in the Snakes and Ladders game contains vocabulary illustrations that students must answer. If the answer is correct, the student can move forward in the game, while if the answer is wrong, another group member has the right to replace them. "In addition, the teacher gives an extra challenge when students land on the snake box. Besides moving down according to the game rules, students must also answer additional questions written on paper to reinforce their vocabulary understanding. The game continues until one group reaches the finish line first. The group that reaches the finish line first wins the game. However, after finishing, the teacher provides a challenge sheet containing additional questions about the vocabulary learned during the game. This question sheet helps measure students' understanding and ensures that each participant grasps the material covered. This dual-layered assessment, both formative during the game and summative through the challenge sheet, contributed to a more comprehensive measurement of vocabulary acquisition.

After completing the intervention stage, the researchers conducted a Post-test to evaluate the score changes after applying the Snakes and Ladders game-based learning media. The Post-test data were then analyzed and compared with the pretest scores to determine the effectiveness of the learning media in improving students' vocabulary mastery. Based on the statistical analysis results, the average score of students in the pretest was 71.61, while in the Post-test, it increased significantly to 94.11. The difference in the average score was 22.50. This substantial increase reflects a meaningful learning gain attributable to the intervention and implies successful internalization of vocabulary through interactive learning. This finding supports the research hypothesis that using the Snakes and Ladders game-based learning media can significantly improve students' vocabulary mastery.

Further statistical analysis with a paired t-test showed a statistically significant difference in pretest and Post-test scores with $t(17) = -12.144$ and $p < 0.001$. This finding reinforces that the Snakes and Ladders game affects students' vocabulary improvement. The very low p-value (< 0.001) strengthens the claim that the observed differences were not due to random chance but to the treatment administered. In addition, the calculation of effect size using Cohen's d showed a value of $d = 3.79$, indicating that the impact of using this learning media falls into the massive category of improving students' vocabulary acquisition.

The educational game approach to learning is important in increasing students' motivation and engagement in understanding the material (Atisyah & Ilmiani, 2024). Using game-based learning media, such as Snakes and Ladders, not only creates a more interactive learning experience but has also proven effective in improving students' vocabulary acquisition (Busran et al., 2025). Various studies have examined Snakes and Ladders as a learning medium and identified it as an edutainment approach. This approach not only creates a more interactive and fun learning experience but also contributes positively to the achievement of student learning outcomes (Wandini et al., 2021). Constructivism theory also supports this result, where interactive learning increases students' motivation, engagement, and memory to relate new knowledge to real experiences better (Rendi Wibowo et al., 2024). Thus, educational games such as Snakes and Ladders not only serve as learning aids but also as a means that allow students to build their understanding actively through direct experience.

The findings of this study align with previous research, which indicates that interactive learning media possess practical characteristics and are easy to integrate into the teaching and learning process (Kasanah et al., 2022). Similarly, a study by Maulidar & Suryawati (2023) Implementing Snakes and Ladders as a learning medium significantly enhances student interest compared to conventional teaching methods. Additionally, Lestari (2024) Demonstrated that the Snakes and Ladders game effectively facilitates vocabulary acquisition by introducing new words through an engaging and interactive approach. These converging lines of evidence provide a strong basis for advocating the broader use of such media in primary language education.

Based on the study's findings, integrating Snakes and Ladders as a game-based learning medium

effectively enhances students' vocabulary mastery. This approach provides an engaging learning experience, enabling students to actively participate in understanding new vocabulary. Additionally, the game fosters an enjoyable learning environment, motivating students to engage more in the learning process. The game's interactive nature, both in peer interactions and with the learning material, reinforces vocabulary retention. Furthermore, the results suggest that a game-based approach strengthens vocabulary retention through experiential learning and repetition, aligning with previous research that highlights the effectiveness of game-based learning in improving vocabulary acquisition. The game's strategic combination of competition, collaboration, and reinforcement mechanisms serves cognitive and affective aspects of learning, helping to sustain interest and long-term retention.

However, this study has certain limitations, particularly the relatively small sample size, which may restrict the generalizability of the findings to a larger population. Additionally, factors such as students' learning styles and variations in language proficiency levels may influence the game's effectiveness. Therefore, future research should expand the sample size and explore diverse game design variations, such as incorporating digital elements or developing more complex game scenarios, to optimize vocabulary learning outcomes further.

4. CONCLUSION

Based on the study's findings, using the Snakes and Ladders game-based learning media significantly enhances students' vocabulary acquisition. The game fosters an interactive and engaging learning experience, allowing students to participate in understanding and long-term vocabulary retention actively. Statistical analysis showed a notable improvement between pre-test and post-test scores, with an average increase of 22.50 points. The results of the paired t-test, along with a large effect size (Cohen's $d = 3.79$), provide strong evidence for the effectiveness of this game-based learning method in supporting vocabulary mastery.

This study demonstrates that incorporating physically active, game-oriented learning strategies can substantially increase elementary students' vocabulary acquisition. Physical movement and group-based interaction contribute to higher learner motivation and cognitive engagement than traditional rote memorization methods.

However, limitations such as the relatively small sample size and narrow educational scope necessitate further research with broader populations and varied contexts. Future studies should consider applying this method across different grade levels and settings and exploring technological integrations—such as digital or augmented reality-based versions of Snakes and Ladders—to enhance adaptability and learner immersion. Additionally, investigating the game's impact on other language domains, such as reading comprehension and oral fluency, may broaden its pedagogical relevance. Through ongoing innovation and research, educators and instructional designers can further optimize game-based learning strategies to support comprehensive language development.

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