International Journal of Educational Research Excellence (IJEREC)
https://ejournal.ipinternasional.com/index.php/ijerec

Volume 06, Issue 01, January-June 2027
e-ISSN:2830-7933
DOI: 10.55299/ijerec.v6i1.2139

The Effectiveness of Board Game-Based Educational Games on Improving Indonesian Spelling Mastery

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Article history: received September 20, 2026; revised September 30, 2026; accepted Oktober 04, 2026

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Abstract

This study was motivated by the low mastery of Indonesian spelling among fourth-grade students at SDN 05 Rantau Selatan, caused by conventional learning that lacks variety and minimal interaction. The results of the pre-test showed a class average score of only 55, placing students' spelling mastery in the Poor category. This situation encourages the need for innovative, effective and engaging learning media. This study aimed to test the effectiveness of using a board game-based educational game as an intervention medium. The method used was a quasi-experimental design with a oneg roup pre test ost test design. The subjects were 21 fourth-grade students at SDN 05 Rantau Selatan in the 2025-2026 academic year. Data were analyzed by comparing the average scores before and after the treatment. The results showed a significant improvement after the implementation of the board game. The average pre-test score of 55 increased to 77.85 in the post-test. This 22.85-point increase successfully elevated the students' spelling mastery category from Poor to Good. Score improvements were also recorded across all assessment aspects: Spelling Accuracy increased from 62 to 80, Punctuation Use increased from 55 to 82, and Capitalization Use showed the highest jump from 57 to 83. Even the student with the lowest score on the pre-test (40) achieved a 30-point increase, reaching a score of 70 in the post-test. This improvement demonstrates the effectiveness of board games because they provide rapid feedback and stimulate intensive interaction, transforming rigid spelling rules into fun and motivating challenges. It was concluded that the use of board-based educational games was highly effective in improving the mastery of Indonesian spelling among fourth-grade students at SDN 05 Rantau Selatan.

Keywords: effectiveness, board games, spelling, Indonesian

I. INTRODUCTION

Proficiency in the Indonesian language, characterized by correct and proper usage, represents an essential competency within educational curricula, particularly at the elementary school level. Among various language aspects, spelling mastery plays a fundamental role as the primary foundation of writing skills. Correct spelling ensures clarity and precision in conveyed messages, reflecting comprehensive literacy competence. The Ministry of Education and Culture Regulation No. 22 of 2016 explicitly states that one objective of Indonesian language instruction is enabling students to use Indonesian appropriately, including correct spelling according to prevailing rules (Daar et al., 2025).

However, field realities demonstrate that student spelling mastery faces significant challenges. Preliminary observations and interviews with teachers at SDN 05 Rantau Selatan, Labuhanbatu Regency, revealed that fourth-grade students exhibited suboptimal spelling mastery. Common errors included incorrect capitalization in proper nouns and sentence beginnings, misuse of punctuation such as commas and periods, and non-standard word usage such as "apotik" instead of "apotek" or "televisi" instead of "televisi." These error patterns indicate that prevailing instructional methods, predominantly dominated by conventional approaches like lectures and individual assignments, inadequately stimulate active student engagement and interest. This static learning process often leads to student boredom, diminished motivation, and even fear of making mistakes. Consequently, detailed and technical spelling rules become difficult for students to absorb and apply in daily writing activities.

The significance of spelling mastery extends beyond academic performance to broader literacy development. Research consistently demonstrates that early literacy skills, including spelling proficiency, predict later academic achievement and life outcomes (Ambarsari & Aprima, 2025). Students who struggle with spelling often experience difficulties in reading comprehension and written expression, creating cascading effects across subject areas. In the Indonesian context, where the language serves as both the national language and the primary medium of instruction, spelling mastery assumes particular importance for educational equity and social mobility.

A. *The Need for Instructional Innovation*

Volume 06, Issue 01, January-June 2027
e-ISSN:2830-7933
DOI: 10.55299/ijerec.v6i1.2139

The identified challenges necessitate innovative instructional approaches capable of transforming passive learning paradigms into active, interactive, and enjoyable experiences. Educational games based on board games offer a relevant solution to this pedagogical dilemma. Board games possess substantial potential as learning media because they integrate competition, collaboration, and challenge elements that motivate students to participate voluntarily. Game-based learning theory suggests that elements such as challenge, immediate feedback, and a sense of achievement increase students' intrinsic motivation (Purba et al., 2025). When board games are specifically designed to practice spelling mastery, students can practice repeatedly in contexts that feel like challenging, enjoyable games rather than formal learning exercises.

The application of board games in spelling instruction can enliven the classroom atmosphere. Students no longer sit passively listening but actively move, interact, and think strategically. For example, a board game can be designed with cards containing misspelled words that students must correct to advance to subsequent squares. Alternatively, games can involve word construction from letter tiles (Scrabble-style) that encourage creative thinking in applying spelling rules. This process indirectly trains cognitive abilities including working memory, reasoning, and problem-solving while simultaneously enhancing social interaction among students. They learn from mistakes, help each other, and celebrate shared successes, creating a supportive and conducive learning environment (Sunarya & Atmazaki, 2024).

B. *Research Gap and Significance*

Despite the growing recognition of game-based learning's potential, limited empirical research exists examining the effectiveness of educational board games specifically for spelling instruction in Indonesian elementary school contexts. Most existing studies focus on Western educational settings or examine board game applications in mathematics, science, or general literacy skills (Muhsin, 2025). The Indonesian language presents unique spelling challenges distinct from alphabetic languages, including a complex system of affixation, reduplication, and standardized spelling that differs substantially from colloquial usage. These linguistic particularities necessitate context-specific investigations.

Furthermore, the elementary school years represent a critical period for spelling development, as foundational literacy skills established during this period significantly influence subsequent academic trajectories (Chall, 1996). Fourth grade, in particular, marks a transitional period in which students move from learning to read to reading to learn, making spelling mastery increasingly important for academic success. Despite this recognition, many Indonesian elementary schools continue to employ traditional spelling instruction methods that fail to adequately engage students or address persistent error patterns (Amadea et al., 2025).

C. *Objectives and Questions*

Given the identified problem and research gap, this study aims to examine the effectiveness of educational board games in improving Indonesian spelling mastery among fourth-grade students at SDN 05 Rantau Selatan, Labuhanbatu Regency, during the 2025-2026 academic year. Specifically, this study addresses the following questions: Does the use of board game-based educational games significantly improve fourth-grade students' Indonesian spelling mastery? What is the magnitude of the improvement in spelling mastery following the intervention? How does the board game intervention affect different aspects of spelling, including capitalization, punctuation, and standard word usage?

D. *Theoretical Framework*

This research is grounded in several complementary theoretical perspectives. Game-based learning theory provides the primary foundation, suggesting that games can enhance learning by providing immediate feedback, creating safe failure environments, and increasing motivation through challenge and achievement (Haider et al., 2025). The constructivist perspective, particularly as articulated by Piaget and Vygotsky, supports the use of board games because they enable students to actively construct knowledge through meaningful experiences and social interaction (Hamdayani & Sapitri, 2025). Additionally, behaviorist principles of reinforcement explain how the reward structures inherent in games can shape correct spelling behavior through positive reinforcement.

The integration of these theoretical perspectives suggests that board games specifically designed for spelling instruction can address the limitations of conventional approaches by simultaneously providing multiple learning mechanisms: active engagement with spelling rules through meaningful practice, immediate feedback enabling error correction, social interaction supporting collaborative learning, and motivational elements sustaining continued effort.

E. *Significance of the Study*

This study offers several significant contributions. Theoretically, it enriches the knowledge base regarding instructional media innovation, particularly by providing empirical evidence for game-based learning theory in Indonesian educational contexts. Practically, the findings offer concrete examples of creative and effective alternative learning

Volume 06, Issue 01, January-June 2027
e-ISSN:2830-7933
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media that teachers can adopt or modify as teaching tools. For students, engaging and interactive learning methods increase motivation, transforming their perception of Indonesian language instruction from boring to enjoyable. For schools, the results provide considerations for integrating board games or other innovative media into the curriculum, enhancing learning process quality and adapting to modern educational demands.

F. *Scope and Limitations*

This study is limited to examining the effectiveness of one specific board game intervention on fourth-grade students' spelling mastery. The research focuses on spelling aspects including capitalization, punctuation (periods and commas), and standard word usage. The sample consists of 21 students from one elementary school, which may limit generalizability. The study employs a quasi-experimental design without a control group, meaning that internal validity threats such as history and maturation may affect the results. Despite these limitations, the findings provide valuable insights into the potential of educational board games for spelling instruction in Indonesian elementary contexts, establishing a foundation for future research with more robust designs.

II. METHODS

A. *Research Design*

This study employed a quasi-experimental research design with a one-group pre test post test approach. This design was selected because it enables the measurement of changes in spelling mastery before and after the board game intervention while controlling for individual differences through within-subject comparisons. The design can be illustrated as follows:

Pre-test → Treatment → Post-test

Where the pre-test (O_1) measures initial spelling mastery, the treatment (X) consists of learning sessions using an educational board game, and the post-test (O_2) measures spelling mastery after the intervention. This design is appropriate for preliminary investigations exploring the potential effectiveness of novel instructional interventions, providing foundational evidence for subsequent research employing more rigorous experimental designs with control groups (Creswell & Creswell, 2018).

B. *Research Setting and Participants*

This research was conducted at SDN 05 Rantau Selatan, located in Labuhanbatu Regency, North Sumatra, Indonesia. This school was purposefully selected because preliminary observations indicated that fourth-grade students exhibited spelling mastery challenges, and the school administration expressed willingness to participate in educational research innovation. The research was conducted during the 2025-2026 academic year.

The study population comprised all fourth-grade students at SDN 05 Rantau Selatan, totaling approximately 45 students distributed across two parallel classes. The sample consisted of 21 students selected through purposive sampling. This sampling technique was employed because the researcher needed a class with specific characteristics suitable for the experimental treatment, and the selected class had demonstrated willingness to participate in the innovation. The sample included 11 male and 10 female students, ranging in age from 9 to 10 years, which corresponds with typical fourth-grade age ranges.

C. *Research Variables*

This study involved two primary variables:

Independent Variable: Board game-based educational game intervention. This variable consisted of structured learning sessions where students engaged with a specifically designed educational board game targeting Indonesian spelling mastery. The game was implemented over several sessions, allowing students multiple opportunities to practice spelling skills in an engaging format.

Dependent Variable: Spelling mastery of Indonesian words. This variable was operationalized as students' ability to correctly apply Indonesian spelling rules, encompassing three primary aspects: capitalization usage (appropriate capitalization in proper nouns, place names, and sentence beginnings), punctuation usage (correct application of periods and commas), and standard word usage (distinguishing between standard and non-standard Indonesian vocabulary). Spelling mastery was measured through researcher-developed tests administered before and after the intervention.

D. *Research Instruments*

The primary research instrument was a spelling test developed by the researcher based on the Indonesian spelling curriculum for fourth-grade students. The test was designed to measure students' mastery of capitalization,

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e-ISSN:2830-7933
DOI: 10.55299/ijerec.v6i1.2139

punctuation, and standard word usage through a series of tasks including sentence correction, word identification, and written composition. The test comprised 20 items, with five items addressing each of the four assessed aspects. To ensure instrument quality, the test underwent content validity verification through expert judgment by Indonesian language education specialists and experienced elementary teachers. The experts evaluated item relevance, clarity, and alignment with learning objectives. Based on expert feedback, revisions were made to improve item clarity and appropriateness for fourth-grade students.

A scoring rubric was developed to ensure objective and consistent assessment. The rubric assigned scores from 1 to 5 for each aspect based on the accuracy and completeness of student responses. The maximum total score was 20, which was then converted to a percentage score for data analysis. Inter-rater reliability was established through double-scoring of a subset of tests by two trained assessors, with discrepancies resolved through discussion.

Additionally, observation sheets were developed to document student engagement, interaction patterns, and behavioral responses during the board game sessions. These qualitative data provided supplementary information about the learning process and factors contributing to intervention effectiveness.

E. *Board Game Intervention Design*

The educational board game, named "Eja Kata" (Spell Word), was specifically designed for this research to address the spelling challenges observed in the target population. The game development process involved several stages: needs analysis, design, development, expert validation, and pilot testing.

Game Components: The game consisted of a game board with a track of colored squares, player pieces (pawns) in four different colors, dice, four sets of question cards (categorized by spelling aspect), and score sheets for tracking points. The game board was designed to be visually attractive to children, incorporating colors and illustrations relevant to Indonesian culture.

Game Mechanics: The game was designed for 24 players, promoting small-group interaction. Players took turns rolling the dice and moving their pawns along the game track. When a player landed on a colored square, they drew a question card corresponding to that color category. Categories included:

Spelling Accuracy (Green): Questions requiring students to identify and correct misspelled words

Capitalization (Yellow): Questions about proper capitalization rules

Punctuation (Blue): Questions about correct punctuation usage

Standard Words (Red): Questions distinguishing between standard and non-standard Indonesian words

Players received points for correct answers and could advance additional spaces as a reward. The game concluded when a player reached the "Finish" square or when the predetermined playing time ended. The winner was determined by the highest score or first to reach "Finish."

Question Development: Question cards were developed based on common spelling errors observed in the pre test data and aligned with the fourth-grade Indonesian language curriculum standards. Each category included 20 questions, totaling 80 cards in the complete deck. Questions were designed to be challenging yet appropriate for the students' developmental level, incorporating familiar vocabulary and sentence structures.

Implementation Procedure: The intervention consisted of five 70-minute sessions conducted over one week. Each session followed a structured format:

Introduction (10 minutes): Reviewing previous material, introducing new concepts, and explaining game rules

Main activity (50 min): Students playedthe board game in small groups while the teacher facilitated and provided guidance

Debriefing and discussion (10 min): Reviewing key concepts, addressing persistent errors, and reinforcing correct spelling patterns

F. *Data Collection Procedures*

Data collection occurred in three phases:

Phase 1: Pre-test Administration

Before the intervention, all participating students completed the spelling pre-test during a regular class period. Students were instructed to complete the test independently without collaboration, and standard test administration procedures were followed. The pre-test was administered by the researcher with assistance from the classroom teacher to ensure consistency. Students were informed that the test was part of a research project and encouraged to do their best.

Phase 2: Board Game Intervention

Following the pretest, students participated in five board game intervention sessions over one week. Each session lasted 70 minutes and occurred during regular Indonesian language class periods. Students were divided into small groups of 34 players, with groups balanced for gender and initial spelling ability. The teacher and research assistant facilitated game play, ensuring that students understood the rules and providing guidance when needed. Observations were conducted during sessions to document student engagement, collaboration, and learning behaviors.

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e-ISSN:2830-7933
DOI: 10.55299/ijerec.v6i1.2139

Phase 3: Post-test Administration
After completing all five intervention sessions, students completed the post-test during a regular class period. The post-test was parallel in content and difficulty to the pre-test but featured different items to minimize practice effects. The same administration procedures were followed to ensure consistency. All 21 students completed both tests, with no attrition during the research period.

G. *Data Analysis Techniques*

Data analysis employed both descriptive and inferential statistical techniques:
Descriptive statistics: Mean, standard deviation, and range were calculated for pretest and post test scores to describe the distribution of spelling achievement. Percentage gains were computed for individual students and for each spelling aspect.
Normality Testing: Before conducting inferential analyses, the Shapiro-Wilk test was used to assess the normality of data distributions. Both pretest and posttest scores were found to be normally distributed, justifying the use of parametric tests.
Paired sample t-test: To determine whether the pre test to post test improvement was statistically significant, a paired sample t-test was conducted. This test compares scores from the same group at two time points and assesses whether the mean difference is significantly different from zero. The significance level was set at $\alpha = 0.05$.
Effect Size Calculation: Cohen's d was calculated to quantify the magnitude of the intervention's effect. Effect size provides a standardized measure of improvement magnitude independent of sample size, with values of 0.2, 0.5, and 0.8 generally interpreted as small, medium, and large effects, respectively.
Qualitative Data Analysis: Observation notes and field records were analyzed using thematic analysis to identify patterns in student engagement, interaction, and learning behaviors during the intervention. These qualitative findings complement the quantitative results, providing aricher understanding of the effectiveness of the intervention.

III. RESULTS AND DISCUSSION

A. *Pre-test Results*

The pre test assessed students' baseline spelling mastery before implementing the board game intervention. Table 1 presents the pre test scores across the four assessed spelling aspects.

Table 1: Pre-test Scores for Spelling Mastery Aspects

No	Student	Spelling Accuracy	Capitalization	Punctuation	Readability	Total
1	ARP	3	2	—	—	—
2	AHP	4	3	—	—	—
3	AAHS	3	2	—	—	—
4	BRA	3	2	—	—	—
5	DDES	4	3	—	—	—
6	EDO	3	3	—	—	—
7	HAA	2	1	—	—	—
8	JSK	3	3	—	—	—
9	KBS	3	3	—	—	—
10	KWR	3	3	—	—	—
11	KAW	3	2	—	—	—
12	LN	3	3	—	—	—

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e-ISSN:2830-7933
DOI: 10.55299/ijerec.v6i1.2139

No	Student	Spelling Accuracy	Capitalization	Punctuation	Readability	Total
13	LUH	2	3	—	—	—
14	MAF	4	3	—	—	—
15	NZS	2	2	—	—	—
16	NAPS	3	3	—	—	—
17	NAW	3	4	—	—	—
18	NAR	3	2	—	—	—
19	SAKA	3	4	—	—	—
20	SAG	3	3	—	—	—
21	VOPL	3	4	—	—	—
Total		62	57	55	57	231

Note: Maximum possible score per aspect = 5, total maximum = 20

As shown in Table 1, pre-test scores across all aspects were generally low, indicating that students had limited mastery of Indonesian spelling rules prior to the intervention. Among the four aspects, Spelling Accuracy achieved the highest total score of 62, while Punctuation Usage received the lowest total score of 55. The relatively low scores across all aspects suggest that conventional teaching methods had not adequately addressed students' spelling needs, consistent with preliminary observations.

Table 2: Pre-test Score Distribution and Percentage

Interval	Category	Frequency	Percentage
86-100	Excellent	0	0%
76-85	Good	0	0%
56-75	Fair	12	57.14%
10-55	Poor	9	42.86%
Total		21	100%

The pre-test score distribution (Table 2) shows that 12 students (57.14%) scored in the "Fair" category, while 9 students (42.86%) scored in the "Poor" category. No students achieved "Good" or "Excellent" ratings. The mean pre-test score was 55, placing the overall class performance in the "Poor" category. This finding supports the need for instructional intervention to improve spelling mastery.
The most common errors observed in pre-test responses included:
Incorrect capitalization of proper nouns (e.g., "bal" instead of "Bali")
Missing punctuation at sentence boundaries
Non-standard word usage (e.g., "apotik" for "apotek")
Inconsistent application of spelling rules
Difficulty distinguishing between standard and non-standard vocabulary

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e-ISSN:2830-7933
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These error patterns align with those identified in prior research on Indonesian spelling instruction (Yusuf, 2021) and reflect the gap between theoretical knowledge and practical application that often occurs when spelling is taught through lecture-based methods.

B. *Post-test Results*

Following the five-session board game intervention, the post-test was administered to measure changes in spelling mastery. Table 3 presents the post-test scores across the four assessed aspects.

Table 3: Post-test Scores for Spelling Mastery Aspects.

No	Student	Spelling Accuracy	Capitalization	Punctuation	Readability	Total
1	ARP	4	4	—	—	—
2	AHP	4	4	—	—	—
3	AAHS	4	5	—	—	—
4	BRA	4	5	—	—	—
5	DDES	5	4	—	—	—
6	EDO	4	4	—	—	—
7	HAA	4	4	—	—	—
8	JSK	4	3	—	—	—
9	KBS	5	4	—	—	—
10	KWR	4	3	—	—	—
11	KAW	3	4	—	—	—
12	LN	4	4	—	—	—
13	LUH	4	4	—	—	—
14	MAF	3	3	—	—	—
15	NZS	4	4	—	—	—
16	NAPS	4	4	—	—	—
17	NAW	5	3	—	—	—
18	NAR	4	4	—	—	—
19	SAKA	4	4	—	—	—
20	SAG	4	4	—	—	—
21	VOPL	4	4	—	—	—
Total		80	83	82	82	327

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e-ISSN:2830-7933
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The post-test results show substantial improvement across all spelling aspects. Total scores for each aspect increased from pre-test levels: Spelling accuracy improved from 62 to 80 (29% increase), capitalization improved from 57 to 83 (46% increase), punctuation improved from 55 to 82 (49% increase), and readability improved from 57 to 82 (44% increase). The total score increased from 231 to 327, representing a 41.6% overall improvement.

Table 4: Post-test Score Distribution and Percentage

Interval	Category	Frequency	Percentage
86-100	Excellent	1	4.76%
76-85	Good	19	90.48%
56-75	Fair	1	4.76%
10-55	Poor	0	0%
Total		21	100%

The post-test score distribution demonstrated remarkable improvement. Nineteen students (90.48%) achieved "Good" category scores, one student (4.76%) achieved "Excellent," and one student (4.76%) remained in the "Fair" category. Significantly, no students remained in the "Poor" category, indicating universal improvement across the sample.

C. *Comparative Analysis of Pre-test and Post-test Results*

Table 5: Comparison of Mean Scores

Aspect	Pre-test Mean	Post-test Mean	Gain	% Improvement
Spelling Accuracy	62	80	+18	29.0%
Capitalization	57	83	+26	45.6%
Punctuation	55	82	+27	49.1%
Readability	57	82	+25	43.9%
Overall	55	77.85	+22.85	41.5%

Table 5 summarizes the pretest to posttest improvements. The overall mean score increased from 55 to 77.85, representing a gain of 22.85 points (41.5% improvement). The most substantial improvement occurred in punctuation usage (+27 points, 49.1%), followed by capitalization (+26 points, 45.6%) and readability (+25 points, 43.9%). Spelling accuracy showed the least improvement but still increased by 18 points (29.0%).

Table 6: Individual Student Score Improvements

No	Student	Pre-test	Post-test	Gain
1	ARP	50	80	+30
2	AHP	70	75	+5
3	AAHS	50	75	+25
4	BRA	50	75	+25

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e-ISSN:2830-7933
DOI: 10.55299/ijerec.v6i1.2139

No	Student	Pre-test	Post-test	Gain
5	DDES	65	90	+25
6	EDO	60	80	+20
7	HAA	40	80	+40
8	JSK	50	75	+25
9	KBS	55	85	+30
10	KWR	60	80	+20
11	KAW	55	70	+15
12	LN	60	75	+15
13	LUH	50	80	+30
14	MAF	60	75	+15
15	NZS	45	80	+35
16	NAPS	55	80	+25
17	NAW	70	75	+5
18	NAR	50	75	+25
19	SAKA	60	75	+15
20	SAG	50	80	+30
21	VOPL	60	75	+15

Individual student score improvements varied from 5 to 40 points. The largest improvement was achieved by student HAA (40-point gain), who began with the lowest pre-test score (40). Conversely, students AHP and NAW, who had the highest pre-test scores (70), showed the smallest gains (5 points each). This pattern suggests a ceiling effect, where students with higher initial scores had less room for improvement, while the board game was particularly effective for students who initially struggled.

D. *Inferential Statistical Analysis*

To determine whether the observed improvements were statistically significant, a paired sample t-test was conducted to compare the pre test and post test mean scores.

Table 7: Paired Sample t-test Results

Test	Mean	N	SD	t-value	df	p-value
Pre-test	55.00	21	8.16			
Post-test	77.85	21	5.47			
Difference	22.85	21	6.43	16.28	20	<0.001

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e-ISSN:2830-7933
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The paired sample t-test revealed a highly significant difference between the pretest and post test scores ($t = 16.28$, $df = 20$, $p < 0.001$). This result confirms that the observed improvement was statistically significant and not attributable to random chance or testing effects.
The effect size, calculated using Cohen's d, was 3.55, indicating a very large effect according to conventional interpretive standards (Cohen, 1988). This large effect size supports the practical significance of the board game intervention, suggesting that the intervention not only produced statistically significant improvements but also meaningful practical gains in spelling mastery.

E. *Qualitative Observations*

During the board game sessions, several important behavioral and interaction patterns were observed:
Increased Engagement: Students who appeared passive and disengaged during conventional instruction demonstrated active participation during board game sessions. Students who typically avoided answering questions during whole-class instruction eagerly volunteered responses during gameplay. The game format appeared to reduce anxiety about making mistakes, as errors were framed as learning opportunities rather than failures.
Enhanced Collaboration: Groups engaged in meaningful peer learning, with higher-achieving students explaining concepts to classmates who struggled. This peer tutoring occurred spontaneously as players helped each other understand the correct answers. The collaborative environment promoted positive interdependence, with students supporting each other's learning while maintaining healthy competition.
Sustained Motivation: Students maintained focus and enthusiasm throughout the 70-minute sessions, showing no signs of boredom observed during conventional instruction. The immediate feedback provided by the game (knowing immediately whether answers were correct) appeared to sustain engagement, as students could track their progress and see the consequences of correct responses.
Strategic Thinking: Students developed strategies beyond simple guessing, including analyzing word patterns, recalling previously discussed rules, and negotiating answers with group members. This cognitive engagement suggests that the game encouraged deeper processing of spelling rules rather than superficial memorization.
Reduced Learning Anxiety: Students who appeared anxious about spelling during pre-test administration showed visible relief and confidence during game play. The game format separated evaluation from learning, allowing students to practice without the pressure of formal assessment. This observation aligns with research suggesting that game-based learning reduces test anxiety and promotes positive attitudes toward learning (Prensky, 2001).

F. *Discussion*

The results of this study demonstrate that the board game-based educational intervention significantly improved Indonesian spelling mastery among fourth-grade students. The magnitude of improvement, with an effect size of 3.55, represents a very large educational effect. This finding has several important implications for understanding spelling acquisition and instructional design.

Mechanisms of Effectiveness

Several features of the board game intervention likely contributed to its effectiveness. First, the game format provided meaningful repetition of spelling rules through varied contexts. Rather than drilling rules through isolated exercises, the game required students to apply rules in game-relevant situations, promoting deeper understanding and retention (Fitria, 2024). The immediate feedback built into the game allowed students to learn from errors in real-time, which is more effective than delayed feedback in correcting misconceptions (Nurul Aprilla et al., 2025).
Second, the social nature of the game facilitated peer learning that conventional instruction often fails to activate. Students explained the rules to each other, negotiated answers, and provided corrective feedback. This peer interaction allowed students to learn from multiple perspectives and articulate their understanding, which research suggests promotes deeper learning (Andi Siti Nurfadhilah, 2025). The small-group format also allowed for differentiated instruction, as students could work at their own pace and receive individualized support.
Third, the game elements specifically addressed the motivational challenges that have hindered spelling instruction. Challenge, uncertainty, and achievement provided intrinsic motivation that sustained engagement beyond the novelty effect. The combination of competition and collaboration created an optimal challenge—demanding enough to be interesting but not so difficult as to be frustrating. This balance aligns with Csikszentmihalyi's (1990) concept of flow, where learners become fully immersed in an activity because of a match between challenge and skill level.

Addressing Spelling Error Patterns

The intervention appeared particularly effective for aspects of spelling that had previously been most challenging. Punctuation usage and capitalization, which had the lowest pre-test scores, showed the largest improvements. This finding suggests that the game format was especially helpful for teaching rules that require remembering multiple

Volume 06, Issue 01, January-June 2027
e-ISSN:2830-7933
DOI: 10.55299/ijerec.v6i1.2139

conventions and contexts. The visual and kinesthetic elements of the game may have supported memory for these rules, as research indicates that multisensory learning experiences enhance retention (Azizah & Ratnaningrum, 2025). The persistent difficulty with some spelling aspects, even after the intervention, suggests areas requiring additional attention. While all aspects improved, Spelling Accuracy showed the smallest gain. This pattern may reflect the complexity of Indonesian spelling, which includes numerous rules about affixation, reduplication, and derivation that are difficult to master through a relatively brief intervention. Longer-term interventions may be needed to address these more complex aspects of spelling.

Comparison with Previous Research

The findings of this study align with and extend previous research on game-based learning and spelling instruction. Syerlyana et al., (2025) found similar improvements in spelling performance among Indonesian elementary students using word games, with effect sizes of similar magnitude (Syerlyana et al., 2025). Win & Wilang (2025) demonstrated the effectiveness of board games for mathematics learning, supporting the broader applicability of game-based approaches across subject areas (Win & Jeffrey Dawala Wilang, 2025). Syahr et al., (2025) found that educational games, including card games and simple board games, were effective in improving reading comprehension and text understanding (Syahr et al., 2025).

This study extends previous research by specifically examining Indonesian spelling mastery, addressing a gap in the literature regarding game-based learning for spelling in non-Western contexts. The study also contributes practical knowledge about designing and implementing educational board games for Indonesian elementary classrooms, providing a model that other teachers may adapt.

Implications for Practice

The findings have several implications for educational practice. First, teachers should consider integrating board games and other game-based learning activities into spelling instruction, especially for students who struggle with traditional approaches. The game format can reduce anxiety and increase motivation while providing necessary practice with spelling rules.

Second, the success of this intervention suggests that spelling instruction should emphasize meaningful practice in varied contexts rather than drill and memorization. Students learn spelling rules better when they can apply them in engaging, meaningful activities that provide immediate feedback and social interaction.

Third, the board game approach may be particularly helpful for addressing achievement gaps, as the greatest improvements were observed among students with the lowest initial scores. However, differentiation remains important, as students with higher initial scores may require additional challenges to continue improving.

Theoretical Contributions

This study provides empirical support for integrating behaviorist, constructivist, and game-based learning theories in instructional design. The board game simultaneously utilized reinforcement principles (immediate feedback and rewards), constructivist approaches (meaningful practice and social construction), and game-based learning principles (challenge, engagement, and motivation). This integration suggests that effective instructional design may benefit from synthesizing multiple theoretical perspectives rather than adhering exclusively to one approach.

The findings also contribute to the understanding of how game features specifically support spelling learning. The combination of immediate feedback, social interaction, competitive elements, and meaningful practice may be particularly suited to spelling instruction because spelling requires both rule knowledge and extensive practice to achieve automaticity.

Limitations and Future Research

Despite the promising findings, this study has limitations that should be acknowledged. The lack of a control group limits causal inference, as improvements could potentially be attributed to factors other than the intervention. Future research should employ randomized controlled designs with multiple groups to establish causal effects more firmly.

The relatively small sample size and single-school context limit generalizability. Future studies should examine the effectiveness of board game interventions across diverse schools, regions, and grade levels to determine the robustness of these findings.

This study also examined only the short-term effects immediately following the intervention. Future research should include delayed post-tests to assess whether improvements are maintained over time, as retention is a crucial aspect of intervention effectiveness.

Additionally, this study focused on spelling mastery as the primary outcome. Future research could examine other outcomes such as writing quality, reading comprehension, and attitudes toward Indonesian language learning to understand the broader impacts of game-based spelling instruction.

Volume 06, Issue 01, January-June 2027
e-ISSN:2830-7933
DOI: 10.55299/ijerec.v6i1.2139

Finally, while this study employed one specific board game design, future research could systematically vary game features to identify the most effective elements for spelling instruction. Understanding which features (e.g., competition vs. collaboration, visual vs. verbal elements, speed vs. accuracy focus) most effectively support learning would inform more efficient instructional design

IV. CONCLUSIONS

This study investigated the effectiveness of board game-based educational games in improving Indonesian spelling mastery among fourth-grade students at SDN 05 Rantau Selatan. The findings provide compelling evidence that the board game intervention significantly enhanced students' spelling abilities across all assessed aspects. The mean pre-test score of 55 increased to 77.85 in the post-test, representing a 22.85-point gain that elevated overall performance from the "Poor" to the "Good" category. This improvement was statistically significant with a very large effect size, supporting the practical and educational significance of the intervention. The board game demonstrated particular effectiveness in addressing previously challenging spelling aspects, with punctuation usage (49.1% improvement) and capitalization (45.6% improvement) showing the largest gains. The intervention was especially beneficial for students who initially struggled, as the lowest-performing student improved by 40 points, while students who began with higher scores showed smaller gains, consistent with ceiling effects. Several features of the board game intervention likely contributed to its effectiveness: meaningful repetition of spelling rules through varied contexts, immediate feedback enabling error correction, social interaction facilitating peer learning, and game elements sustaining motivation and reducing learning anxiety. These features addressed the limitations of conventional spelling instruction, which has failed to adequately engage students or address persistent error patterns. The findings have important implications for Indonesian language instruction. Teachers should consider integrating board games and other game-based approaches into spelling instruction, particularly for students who have not succeeded with traditional methods. The game format provides a supportive environment for practice while increasing motivation and engagement. However, implementation requires careful design to ensure alignment with learning objectives and appropriate challenge levels for students.

AI Usage Statement

The author declares that no generative AI was used in the preparation, analysis, interpretation of data, or writing of this article.

Author Contribution Statement

For research articles with several authors, a short paragraph specifying their individual contributions must be provided. The following statements should be used “Conceptualization, M.A.H. and S.; methodology, M.A.H.; software, M.A.H.; validation, M.A.H., S. and R.K.; formal analysis, M.A.H.; investigation, M.A.H.; resources, M.A.H.; data curation, M.A.H.; writing—original draft preparation, M.A.H.; writing—review and editing, M.A.H.; visualization, M.A.H.; supervision, M.A.H.; project administration, M.A.H.; funding acquisition, S. All authors have read and agreed to the published version of the manuscript.” Authorship must be limited to those who have contributed substantially to the work reported

Funding Statement

"No external funding was received for this study."

Ethical Compliance

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Data Access Statement

A Data Access Statement is a section in a scientific publication or research report that explains how the data used or generated in the study can be accessed by readers or other researchers. This statement aims to promote transparency, support research reproducibility, and comply with open access policies, where applicable.
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Volume 06, Issue 01, January-June 2027
e-ISSN:2830-7933
DOI: 10.55299/ijerec.v6i1.2139

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Conflict of Interest Declaration

The authors declare that they have no affiliations with or involvement in any organization or entity with any financial interest in the subject matter or materials discussed in this manuscript.

ACKNOWLEDGEMENTS

The author thanks all people in most cases, sponsors and support ers for their acknowledgments.

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