The Effectiveness of Roblox Gamified Learning for Junior High School EFL Students

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ABSTRACT

This literature study tested the effectiveness of gamification through the Spelling Race game on Roblox in improving the motivation, engagement, and English learning outcomes of junior high school students. The study used a pre-experimental design with a single-group pretest and posttest with 23 students selected purposively. The findings showed improved learning achievement. The average score increased from 74.17 in the pretest to 79.65 in the posttest, a total score increase of 5.48 points. A paired-sample t-test confirmed a significant difference, with t = 4.78 exceeding the critical t = 2.074. Gamification features in the Roblox app, such as achievements, leaderboards, and visualized feedback, increased student motivation and participation. Students were more actively engaged during the learning process. Interactive activities in the game supported vocabulary, pronunciation, and spelling development. This implementation faced challenges. Schools faced limited technological resources. Teachers needed clear teaching strategies, and learning activities needed to be aligned with the curriculum. Gamification through Roblox showed strong potential as an effective approach to improving English learning outcomes.

Keyword: *Roblox*, *Vocabulary*, *Game-Based learning*, *EFL*, *Students*

ABSTRAK

Kajian literatur ini menguji efektivitas gamifikasi melalui permainan Spelling Race di Roblox dalam meningkatkan motivasi, keterlibatan, dan hasil belajar bahasa Inggris siswa SMP. Studi ini menggunakan desain pra-eksperimental dengan pretest dan posttest kelompok tunggal dengan 23 siswa yang dipilih secara purposif. Temuan menunjukkan peningkatan prestasi belajar. Skor rata-rata meningkat dari 74,17 pada pretest menjadi 79,65 pada posttest, peningkatan skor total sebesar 5,48 poin. Uji t sampel berpasangan mengonfirmasi perbedaan yang signifikan, dengan t = 4,78 melebihi nilai kritis t = 2,074. Fitur gamifikasi dalam aplikasi Roblox, seperti prestasi, papan peringkat, dan umpan balik visual, meningkatkan motivasi dan partisipasi siswa. Siswa lebih aktif terlibat selama proses pembelajaran. Aktivitas interaktif dalam permainan mendukung pengembangan kosakata, pengucapan, dan ejaan. Implementasi ini menghadapi tantangan. Sekolah menghadapi keterbatasan sumber daya teknologi. Guru membutuhkan strategi pengajaran yang jelas dan kegiatan pembelajaran perlu diselaraskan dengan kurikulum. Gamifikasi melalui Roblox menunjukkan potensi yang kuat sebagai pendekatan efektif untuk meningkatkan hasil pembelajaran bahasa Inggris.

Kata Kunci: *Roblox*, *Kosakata*, *Game-Based learning*, *EFL*, *Siswa*

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INTRODUCTION

English Education on the topic of vocabulary mastery is a fundamental component of English proficiency in English as a Foreign Language (EFL) contexts because it enables learners to understand meanings, process classroom input, and participate effectively in language learning activities (Nation, 2021; Webb, 2021; Schmitt et al., 2022). At the junior high school level, students are expected to possess sufficient lexical knowledge to comprehend various text types, follow instructions, and

achieve expected learning outcomes in accordance with the curriculum. Adequate vocabulary knowledge also supports reading comprehension, academic literacy, and broader language development (Grabe & Stoller, 2020; Al-Jarf, 2021; OECD, 2023). However, the actual condition in many Indonesian EFL classrooms remains below this expectation. Many students still demonstrate limited vocabulary size, weak spelling accuracy, difficulty understanding contextual meanings, and low retention of newly learned words, which consequently hinder their academic performance (Albiladi & Alshareef, 2021; Laufer & Cobb, 2021; Nguyen & Boers, 2021). Observation in seventh-grade students at Bruderan Junior High School showed similar conditions, where learners experienced difficulties in vocabulary-related tasks while showing strong interest in digital games. This discrepancy between the expected level of vocabulary competence and the actual classroom reality indicates a clear instructional gap that requires more engaging and effective learning strategies.

Recent studies have increasingly highlighted gamification and game-based learning GBL as promising approaches for improving language learning outcomes. Gamification incorporates game elements such as points, rewards, competition, and feedback into learning activities to increase motivation, participation, and persistence (Deterding et al., 2021; Zainuddin et al., 2021; Hamari et al., 2022). Similarly, GBL provides interactive environments that promote contextualized practice, collaboration, and active cognitive engagement (Hung et al., 2021; Plass et al., 2021). Previous studies generally reported that digital games contributed positively to vocabulary acquisition, learner motivation, and classroom engagement (Chen et al., 2022; Lin & Lin, 2021; Daeli et al., 2023; Juniardi et al., 2023). Nevertheless, existing studies still show several limitations. First, many studies focused on quiz-based, mobile-based, or structured educational games with limited immersion and interaction. Second, previous research predominantly involved elementary or senior high school students, leaving junior high school learners relatively underexplored. Third, although motivation gains have been widely reported, fewer studies specifically examined measurable vocabulary mastery as a direct learning outcome within immersive digital environments (Mystakidis, 2022; Pellas & Mystakidis, 2020; Su & Cheng, 2022).

One emerging platform with potential educational value is Roblox, a multiplayer virtual environment that allows users to interact through avatars, missions, level systems, and real-time communication. Such features can provide repeated vocabulary exposure, contextual language use, immediate performance feedback, and sustained engagement through competition. However, the use of Roblox as a formal vocabulary learning medium in EFL classrooms remains underexplored, particularly for junior high school students. Most previous studies on gamified language learning have examined conventional educational games rather than commercial immersive platforms specifically designed with student familiarity and high engagement potential.

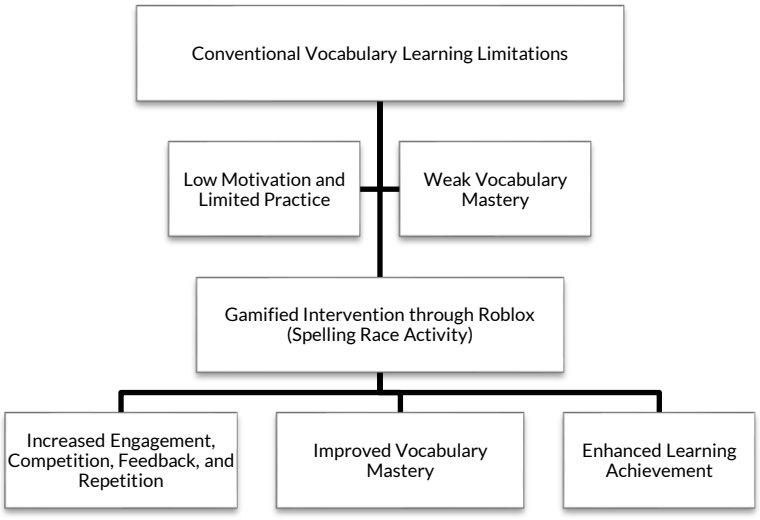

Figure 1. Conceptual Framework of Roblox-Based Gamified Vocabulary Learning for Enhancing Students' Learning Achievement

The novelty of this study lies in the integration of a Roblox-based Spelling Race activity as a gamified vocabulary learning intervention for junior high school EFL learners. Unlike previous studies that mainly used quiz-oriented or semi-interactive platforms, this study applies an immersive virtual environment that combines listening-based word recognition, spelling selection, meaning recall, level progression, and competitive game mechanics in one learning activity. Accordingly, this study aims to investigate the effectiveness of Roblox-based gamification in improving students' vocabulary mastery and to determine whether the intervention significantly enhances students' learning achievement among seventh-grade students at Bruderan Junior High School.

METHOD

This study employed a quantitative approach using a pre-experimental one-group pretest-posttest design to examine the effectiveness of gamified vocabulary learning through the Spelling Race activity on the Roblox platform in improving students' vocabulary mastery and learning achievement. This design was selected to identify measurable changes in students' vocabulary performance before and after the intervention under limited controlled conditions. Vocabulary mastery was used as the primary indicator of learning achievement in the EFL context.

The research design is illustrated as follows:

$O_1 \rightarrow X \rightarrow O_2$

Where:

O_1= Pretest (initial measurement of vocabulary mastery); X= Treatment through Roblox-based gamified learning using Spelling Race; O_2= Posttest (final measurement of vocabulary mastery).

This design enabled the researcher to compare students' performance prior to and after the treatment in order to determine the effect of the intervention.

The participants consisted of 23 seventh-grade students of Bruderan Junior High School, Purworejo, Indonesia. The sample was selected through purposive sampling based on two criteria: (1) students experienced difficulties in mastering English vocabulary, and (2) students showed interest in digital games. All participants were EFL learners whose primary exposure to English occurred through formal classroom instruction.

The primary instrument used in this study was a vocabulary mastery test developed based on English competency indicators for junior high school students. The instrument was designed to assess students' ability to recognize spoken words, identify correct spelling forms, and demonstrate understanding of word meanings as core components of vocabulary mastery.

The test consisted of 30 items administered in both the pretest and posttest with equivalent levels of difficulty to maintain measurement consistency. Each item was presented through an audio recording of a target word. After listening to the word, students were required to select the correctly written form from four multiple-choice options (A, B, C, or D). Students were also required to write the Indonesian meaning of the word in the blank space provided below the options. Accordingly, the instrument measured three aspects:

Listening-based word recognition, referring to students' ability to recognize spoken vocabulary items; Spelling accuracy, referring to students' ability to identify the correct written form of a word; Vocabulary meaning comprehension, referring to students' ability to provide accurate meanings of vocabulary items.

By combining auditory prompts, written recognition, and meaning recall, the instrument provided a broader assessment of vocabulary mastery than conventional text-based multiple-choice tests alone.

Instrument validity was examined through content validity using expert judgment involving an English teacher and a lecturer in English language education. The experts reviewed item relevance, clarity, linguistic appropriateness, and alignment with learning objectives. Instrument reliability was analyzed using Cronbach's Alpha. A coefficient of 0.70 or higher was used as the minimum criterion indicating acceptable internal consistency and suitability for research use.

The study was conducted in three systematic stages:

Pretest

Students completed an initial vocabulary mastery test to identify their baseline performance before the treatment.

Treatment

Students participated in a gamified learning intervention through the Roblox platform using the Spelling Race activity. The treatment was designed to integrate vocabulary learning with interactive gameplay to increase motivation and active engagement. During the intervention, students completed several learning tasks: reading text-based instructions; identifying target vocabulary; selecting correct spelling forms; writing word meanings; completing vocabulary-based challenges in a virtual environment.

The gamification elements implemented in the activity included points accumulated through repeated participation and task completion; leaderboard, displaying score rankings within the class; stage final score, showing the number of correct answers at the end of each level; challenge-based rewards, allowing students to earn bonus points and unlock higher levels. The game consisted of three progressive levels: easy, medium, and high, designed to gradually increase task difficulty and maintain competitive engagement.

RESULT AND DISCUSSION

This section presents the findings of the study and interprets their significance in relation to the research objective, namely, to examine whether Roblox-based gamified vocabulary learning through the Spelling Race activity effectively improves students' vocabulary mastery and learning achievement among junior high school EFL learners.

Results

To evaluate the effectiveness of the intervention, students' pretest and posttest scores were analyzed using descriptive and inferential statistics.

Table 1. Descriptive Statistics of Pretest and Posttest Scores

Test	N	MEAN	SD	MIN	MAX
Pretest	23	74.17	11.42	40	90
Posttest	23	79.65	8.96	60	92

The findings indicate a positive increase in students' performance after the intervention. The mean score improved from 74.17 in the pretest to 79.65 in the posttest, representing an average gain of 5.48 points. In addition, the posttest standard deviation was lower than the pretest, indicating more consistent achievement among participants after treatment. The increase in the minimum score from 40 to 60 also suggests that lower-performing students benefited substantially from the learning intervention.

Table 2. Paired-Sample t-Test Results

Statistic	Value
Mean Difference	5.48
t-Value	4.78
Df	22
p-value	< .001
Cohen's d	0.99

The paired sample t-test showed that the difference between pretest and posttest scores was statistically significant, $t(22) = 4.78$, $p < .001$. The effect size was large ($d = 0.99$), indicating that the intervention had a substantial practical impact on students' vocabulary learning outcomes. These findings confirm that Roblox-based gamified vocabulary learning significantly improved students' vocabulary mastery and learning achievement.

Discussion

The primary objective of this study was to determine whether gamified vocabulary learning through Roblox could improve students' learning outcomes. The results clearly indicate that the intervention was effective, as demonstrated by statistically significant score improvement and a large effect size. Therefore, the findings support the assumption proposed in the Introduction that interactive and game-supported vocabulary learning can provide stronger learning outcomes than conventional approaches relying mainly on memorization and passive practice.

One important finding is that improvement occurred not only in average achievement but also among lower-performing learners. The substantial rise in the minimum score suggests that students with weaker initial vocabulary knowledge were able to progress during the treatment. This may be explained by the scaffolded structure of the Spelling Race activity, in which students repeatedly encountered words through listening prompts, spelling recognition, and meaning recall. Such repeated retrieval opportunities are widely recognized as beneficial for vocabulary consolidation and long-term retention.

The results are consistent with previous international studies reporting positive effects of gamification on vocabulary learning. Research by Chen et al. (2022), Lin and Lin (2021), and Su and Cheng (2022) similarly found that digital game-based learning significantly improved vocabulary achievement. Studies by Panmei and Waluyo (2023), Daeli et al. (2023), and Juniardi et al. (2023) also reported that gamified environments increased motivation and learning participation. Thus, the present findings reinforce the broader consensus that well-designed game elements can positively influence language learning outcomes.

However, this study extends previous findings in several ways. Many earlier studies examined quiz-based or mobile applications such as Quizizz, Wordwall, Kahoot, or Duolingo, where learning interactions are generally limited to answering isolated questions. In contrast, Roblox provided an immersive virtual environment in which students interacted with tasks, levels, missions, and competitive progression systems. Vocabulary learning, therefore, occurred in a more dynamic context involving action, repetition, and goal-oriented participation. This suggests that immersive platforms may generate deeper engagement than flat-response quiz systems.

Another contribution of this study concerns the participant level. Prior studies on digital gamification frequently focused on university students, senior secondary learners, or mixed populations. Junior high school students remain comparatively underrepresented, particularly in research involving immersive commercial platforms. Therefore, this study contributes evidence that Roblox-based gamification can also be effective for adolescent EFL learners at the lower secondary level.

The effectiveness of Roblox in this study may be interpreted through several complementary theoretical perspectives. First, from a motivational perspective, game mechanics such as points, leaderboards, and level progression likely increased persistence and willingness to repeat tasks. Second, from a cognitive perspective, students actively processed vocabulary through listening discrimination, spelling recognition, and semantic recall rather than passively memorizing word lists. Third, from a situated learning perspective, vocabulary tasks were embedded within meaningful progression challenges, making learning more purposeful and less monotonous. The combination of these mechanisms may explain why the intervention produced both statistical significance and a large practical effect.

From a pedagogical perspective, the findings suggest that English teachers may benefit from integrating familiar gaming environments into vocabulary instruction. Rather than depending solely on textbook drills, teachers can design challenge-based learning tasks that encourage repetition, competition, and immediate performance feedback. This may be especially valuable for adolescents who are already accustomed to digital gaming culture and often require stronger stimulation to remain engaged in language classes.

The findings also carry theoretical implications for gamification research. While previous studies have often emphasized motivation as the main benefit of gamified learning, the present study demonstrates that gamification may also generate measurable academic gains when game mechanics are carefully aligned with linguistic learning objectives. In other words, engagement alone is insufficient; effectiveness depends on instructional design quality.

Table 3. Comparison with Selected Previous Studies

No	Author(s)	Focus	Main Finding	Relation to Present Study
1	Chen et al. (2022)	Digital game vocabulary learning	Significant score gains	Consistent
2	Lin & Lin (2021)	Mobile vocabulary games	Higher retention	Consistent
3	Su & Cheng (2022)	Mission-based digital games	Motivation and gains increased	Consistent
4	Panmei & Waluyo (2023)	Gamification in vocabulary learning	Better retention	Consistent
5	Daeli et al. (2023)	Gamified classroom media	Higher test scores	Consistent
6	Juniardi et al. (2023)	Role-playing games	Improved lexical performance	Consistent
7	Hung et al. (2021)	Review of game-based language learning	Mostly positive outcomes	Consistent
8	Zainuddin et al. (2021)	Gamification review	Positive engagement effects	Extended
9	Mystakidis (2022)	Immersive learning environments	Strong engagement potential	Extended
10	Klimova & Kacetl (2021)	Technology-assisted vocabulary learning	Positive support for vocabulary growth	Consistent

The table indicates that the present findings are broadly aligned with earlier studies, while contributing a newer context through the use of Roblox as an immersive platform for junior high school EFL learners.

Limitations

Several limitations should be acknowledged. First, the study used a pre-experimental design without a control group, limiting causal generalization. Second, the sample size was relatively small (n = 23). Third, the treatment period was relatively short, so long-term retention was not measured. Fourth, the study focused primarily on vocabulary outcomes and did not examine other language skills such as speaking or reading comprehension.

Future studies are recommended to employ randomized or quasi-experimental designs with larger participant groups. Researchers may also compare Roblox with other gamified platforms, including delayed posttests to measure retention, and investigate its effects on broader English skills such as reading comprehension, speaking confidence, or collaborative communication.

Overall, this study demonstrates that Roblox-based gamified learning is not merely entertaining but pedagogically meaningful. When learning tasks are carefully designed, immersive gaming platforms can significantly improve vocabulary mastery and contribute to stronger learning achievement among junior high school EFL learners.

CONCLUSSION

This study concludes that Roblox-based gamified learning significantly improved junior high school EFL students' vocabulary mastery, with scores increasing from 74.17 to 79.65 (gain = 5.48, $p < 0.001$). This gain indicates meaningful progress in students' ability to recognize, spell, and understand the English vocabulary required for classroom learning. Theoretically, the findings strengthen evidence that gamification can transform learner motivation into measurable language achievement. Practically, Roblox offers an engaging and effective medium for vocabulary instruction in secondary

EFL classrooms. Future research should determine which game mechanics, competition, collaboration, repetition, or reward systems most strongly drive vocabulary gains, whether the observed improvement is sustained in delayed posttests, and whether Roblox is more effective than conventional gamified tools when controlling for students' initial proficiency and digital familiarity.

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