Vol. 7, No. 2, Oktober 2026
ISSN: 2776-3714 (online)
DOI: https://doi.org/10.9744/aletheia.7.2.114-124

Aletheia
Christian Educators Journal

Is Game-Based Learning Still Effective? A Classroom-Based Experimental Study

Alexandra Ivanna Blanca[1], Betty B.S. Naibaho[2], Cathy Weng[3], Dani Puspitasari[1]*
[1] Faculty of Teacher Education, Petra Christian University, Indonesia
[2] Department of International Business, Tamkang University, Taiwan
[3] Graduate Institute of Digital Learning and Education, National Taiwan University of Science and Technology, Taiwan
e-mail: *puspitadani@petra.ac.id
*Corresponding author

ARTICEL INFO

Keywords:
game-based learning, self-regulated learning, English vocabulary.

ABSTRACT

Young learners, with their excitement in the EFL classroom, need teachers to be more creative to enhance meaningful learning. Because play is part of their learning process, this study used a game-based learning approach to improve vocabulary acquisition. Game-Based Learning (GBL) is an innovative approach that integrates game elements and principles to enhance students' learning outcomes. This study examined GBL's effect on English vocabulary and Self-Regulated Learning (SRL) among elementary students. Findings indicate that fourth-grade students' SRL remains at the co-regulation stage and still requires adult assistance. This finding suggests that SRL development does not always directly align with short-term academic achievement. It suggests that GBL in this context facilitates SRL. The originality lies in demonstrating that GBL creates a positive cycle that makes students enjoy learning, so they participate more, which in turn forces them to engage in SRL, such as preparing for study, and by presenting challenges within the game that enable them to find solutions and plan for improvement.

INTRODUCTION

According to the English proficiency report, Indonesia ranks 80th among 116 countries and 12th among 23 Asian countries (Yang et al., 2024a). Many schools still rely heavily on vocabulary memorization in their EFL classroom (Ficayuma, 2023; Yustiani et al., 2024). We all understand that vocabulary size is the foundation for EFL speakers to speak; thus, vocabulary mastery is essential in the early years of English learning (Schmitt, 2008; Tang, 2023; Yang et al., 2024a). Young children find it discouraging to memorize words without context (Ficayuma, 2023). Teachers need to facilitate fun, meaningful learning activities to maximize vocabulary acquisition (Jaiswal, 2024). Recent studies show that children acquire vocabulary faster when using visual aids and in meaningful context (Andari, 2023; Arsyad, 2024; Hsu et al., 2023). This study used a game-based learning approach in elementary education. As young learners perceive learning through play, it is believed that this approach could reduce anxiety and increase motivation (Bouzaiane & Youzbashi, 2024; Frolli et al., 2023). Previous studies implemented a game-based approach in the context of civic education (Ardi Afriansyah et al., 2024), science (Hussein et al., 2019), math (Safrida et al., 2024), and Italian language (Frolli et al., 2023). This study proposed a game-based approach in the English-as-a-foreign-language classroom in the Indonesian elementary school context. It specifically focused on vocabulary acquisition through games and on how students could apply those words in meaningful, daily sentences. Thus, the research questions are formulated as follows:

1. Does the implementation of the Game-Based Learning (GBL) method affect the improvement of elementary school students' English vocabulary acquisition?
2. How does the Game-Based Learning (GBL) method affect the self-regulated learning of elementary school students?

Literature Review

Vocabulary Acquisition in the EFL Context

Studies show that integrating interactive teaching strategies is effective for young children (Murai et al., 2023; Rosemary & Abouzeid, 2002). Fun learning activities could facilitate vocabulary retention and

motivation (Nguyen, 2026). These activities can be interactive book reading (Decraene et al., 2025), AR-supported experiential learning (AR-EL) (W.-C. V. Wu et al., 2025), or a language app (Jensen & Cadierno, 2024). Vocabulary mastery is a prerequisite for further competence in language learning (Mohamed, 2026). Vocabulary size could determine the speed of learning for upper-level language skills. Students with larger vocabulary sizes are better at keeping up with classroom instruction (Metsala, 2026). This is because they cannot understand both oral and written language input without a certain level of vocabulary mastery (Palacios & Kibler, 2016). A recent study reports that vocabulary mastery and learning motivation significantly predict students' writing in descriptive text (Haryadi, 2022). Students with metalinguistic awareness perform better on vocabulary tests, which, in turn, improves their understanding of grammar (Kieseier et al., 2022). In higher education, many programs also recognize the importance of vocabulary mastery for career preparation (Alharbi, 2024). Thus, "the sooner, the better" approach would benefit language learning.

A study using 3D visuals to teach vocabulary helped elementary students improve vocabulary acquisition and retention (W.-C. V. Wu et al., 2025). Their improvement was credited to the multi-sensory environment. Participants worked hands-on with 3D objects and audio-visual feedback simultaneously. The researchers' observations showed that traditional ESL learning failed beginner learners due to single-channel inputs (like reading or a worksheet), textbook repetition, and lectures from the teacher. These teaching methods led to cognitive exhaustion, poor retention, and low engagement. In contrast, the implementation of the 3D AR environment and Kolb's Learning cycle (Concrete experience-reflection-conceptualization-active experimentation), made English vocabulary become a new concrete and meaningful concept. Thus, their results showed the interactive, multi-sensory environment enhanced word recognition, spelling, and anchoring abstract thought into long-term memory retention.(W.-C. V. Wu et al., 2025).

Another scholar also used generative AI to enhance students' scientific vocabulary, helping them develop comprehensive knowledge of the subject (Lai, 2026). Lai (2026) applied generative AI paired with metacognitive scaffolding into inquiry-based learning and lab report writing tasks. The AI served as an interactive conversational partner that provided contextualized definitions, prompted students to rephrase complex terms, and offered real-time feedback on domain-specific word choice. Instead of only receiving the dictionary definition, the AI tailored the definition to contextual explanations and took into account the students individual comprehension level. This multi-level scaffolding enabled learners to surpass textbook vocabulary memorization and enter into comprehension of the versatility of English vocabulary at a much deeper level.

While focusing on vocabulary mastery, language teachers also need to address negative emotions that occur during learning (Sadan et al., 2026). The language teachers applied Pekrun's Control-Value Theory to show that students—particularly struggling readers—frequently experience negative emotions in relation to their progress and achievement. In these teachers' ESL classrooms, these negative emotions- for example, anxiety, frustration, and boredom- typically arise when the student is faced with vocabulary tasks where they perceive they have little control and feel pressured to perform/complete. To address these negative emotions, which become prohibitors to learning, Sadan et al. incorporated interactive digital game-based learning for an alternative to standard digital worksheets. Sadan et al. found that the gamified format provided a low-stakes, engaging environment that significantly reduced negative emotions and increased feelings of calmness in her students. Taking away the pressure to perform and offering the students the emotional stability and determination needed to combat pressure or the feeling of incompetence.

Game-Based Approach and Students' Self-Regulated Learning in the EFL Classroom

Numerous studies prove that playing games facilitates vocabulary acquisition for EFL learners (Kırkgöz, 2026; Lu & Ha, 2025; Rahmanu & Molnár, 2024; Shi, 2025; Soyoof et al., 2024). While students play games, they simultaneously learn vocabulary that appears in the games. Many educational games were designed to incorporate students' self-efficacy and motivation in learning. Because gaming is competitive, it helps students build resilience to win. The gaming approach brings fun and excitement to the classroom. A recent meta-analysis showed that students could regulate themselves better after participating in a game-based learning classroom, regardless of the subject (Soriano-Sánchez et al., 2026). This study aims to add to previous studies in assessing if there is a correlation between GBL and SRL. While GBM has been well-tested as an effective motivator and eases the stress of achievement on students, etc., previous studies have not yet analysed if GBL can also build SRL.

This is an open access article under the CC BY license

Self-regulated learning is a well-known variable in learning that has been investigated for decades. This variable is strongly related to how individuals set goals and achieve it (Weng et al., 2022). Sometimes, language learning can discourage students because of fear of being assessed (Daud et al., 2022), and there is no difference between males and females in language anxiety in the classroom (Rasool et al., 2023). Recent studies show that technology use could ease tension in EFL classrooms (Chen, 2024). Especially, the integration of digital game-based learning for elementary students has been proven to reduce language learning anxiety (Chao & Fan, 2020; Rasool et al., 2023; Yang et al., 2024b, 2024a) and increase self-regulated learning (Li et al., 2022; J. G. Wu et al., 2025; Yang et al., 2025). If children develop strong SRL at a young age, it instils in them a regimen for setting and achieving goals. In the Indonesian classroom, students are vulnerable to anxiety and loss of motivation because they lack SRL as a personal motivator to excel in English (Ficayuma, 2023; Yustiani et al., 2024). This study aims to examine whether GBL at a young age can develop a lasting SRL approach for ESL learners in Indonesian classrooms.

METHODOLOGY

This study employed an embedded mixed-method design combining quantitative and qualitative approaches. The study involved 68 fourth-grade students at a Christian elementary school in Surabaya, Indonesia, across four Grade 4 classes. This school taught English as a foreign language and used English as a medium of instruction in practice. They believed the young learners could comprehend English as long as the teacher simplified instruction. They began using this method when these students were first graders. Two Game-Based Learning (GBL) interventions were conducted, focusing on English vocabulary related to sea creatures, pollution and movement and force. Each session lasted approximately 75 minutes and incorporated game elements such as challenges, levels, points, competition, collaboration, and feedback. The instructional content was drawn from the students' English learning materials, including the Our World 4 textbook, which was used particularly for the *Movement and Force* lesson, together with supporting videos, worksheets, digital slides, Wordwall activities, and game-based tasks.

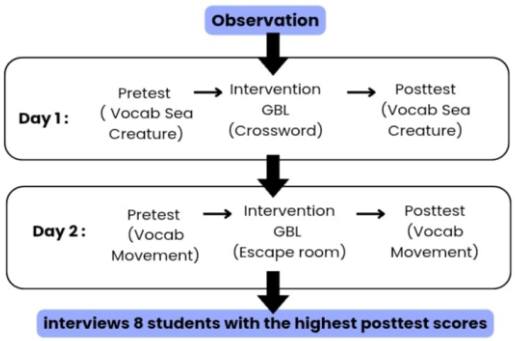


Figure 1. Research procedure

The quantitative component used a one-group pretest–posttest design to examine changes in students' English vocabulary before and after each GBL intervention. Vocabulary achievement was measured using written pretest and posttest instruments adapted from Kasim (2022) and aligned with the vocabulary taught during the interventions. The school coordinator and English curriculum coordinator validated the instruments by evaluating content coverage, curriculum and topic alignment, conceptual accuracy, sequencing, suitability for students, comprehensibility, and language effectiveness. This serves as expert validation.

The qualitative component examined students' Self-Regulated Learning (SRL) through semi-structured interviews and participant observation. The researchers purposely selected eight students based on their high posttest scores and ability to communicate their learning experiences. The interview guide and SRL observation checklist were adapted from Shi and Yang (2025) and organized around three SRL phases: planning/forethought, performance/monitoring, and self-reflection/evaluation. An additional GBL implementation checklist, adapted from Impram (2025) documented the implementation of intended GBL characteristics during classroom instruction.

The games used in the first learning session were a warmup word unscrambling game and a crossword puzzle using new vocabulary rules and their definitions. The theme for the first meeting was: Sea Creatures,

 This is an open access article under the CC BY license

Pollution and Ocean Protection. The unscramble game took place at the beginning of class and in groups of 3-4 students were given clues, which came in the form of either pictures or definitions, and the students had to volunteer a word. This game served as the pre-test. After this activity, the teacher explained, guided the students in exploring, and watched a short video. Then the students returned to groups of 3-4 people and were given a crossword puzzle consisting of 10 new vocabulary words to solve together. The post-test consisted of an individual worksheet which served to test and reinforce new vocabulary skills.

In the second session GBL came in the form of an escape room activity. The theme for the second meeting was: Movement and Force. The pretest consisted of a 10-question multiple choice worksheet. After that the teacher displayed the actions of: push, spin, pull; giving a concrete image of the new vocabulary. Then the teacher guided the students in exploration and explanation of the topic. After that the class was split into four groups for the escape room game. The game consisted of three phases: survival challenge, speed race, and final. In the first phase the teams all start with zero points and take turns answering questions. Correct answers gain points and if the team is unsure they may skip. Skipping costs the team a heart and allows another team to steal the question. In the second phase, speed was the key. The team that hit their buzzer first was awarded the opportunity to answer first. The last stage followed the same rules as round two. The winner of the game was the fastest team, with the most hearts left, and points in total. After the escape-room game came the post test, which consisted of a 10-question fill-in-the-blank worksheet. Figure 2 is an image of the rules for the Escape Room game.

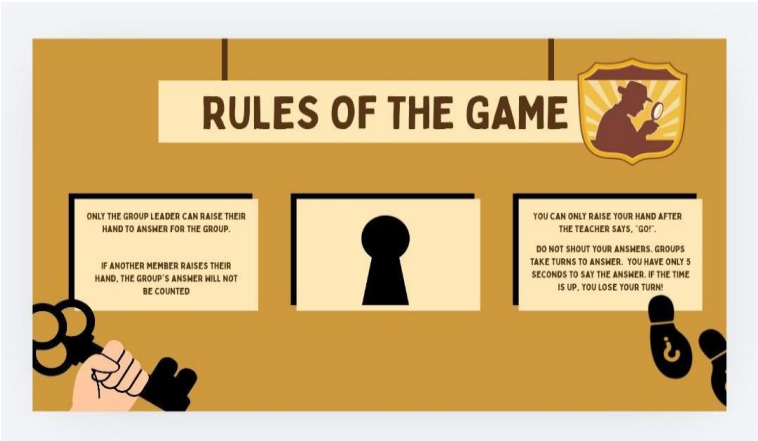


Figure 2. The game rules



Figure 3. Student doing the game-based activity

The learning activities involving the GBL intervention were conducted in two 75-minute sessions. The materials used were part of the school curriculum. Each session began with a pretest and ended with a posttest. The GBL intervention utilised crossword puzzles and escape room games. After both interventions, researchers interviewed the eight students with the highest posttest scores. The students' SRL levels were assessed based on the qualitative findings.

This is an open access article under the CC BY license

RESULTS AND DISCUSSION

This study concludes that game-based learning significantly improves English vocabulary skills. The following are the results of the Wilcoxon test calculations regarding the English vocabulary pretest and posttest. Both pretests assessed the students' vocabulary understanding. The jump in score improvement between pretest 1 and pretest 2 is credited to exposure to the test type and vocabulary between sessions 1 and 2.

Table 1. Descriptive Statistics of English Vocabulary Pretest–Posttest

Descriptive Statistics	N	Mean	Std. Deviation	Minimum	Maximum
Pretest Day 1	68	63.68	16.430	25	88
Pretest Day 2	68	92.35	10.239	60	100
Posttest Day 1	68	79.56	12.979	60	100
Posttest Day 2	68	97.94	5.342	80	100

Table 2. Wilcoxon Test Results for English Vocabulary

Test Statistics	Posttest Day 1 – Pretest Day 1	Posttest Day 2 – Pretest Day 2
Z	-5.898[b]	-3.800[b]
Asymp. Sig. (2-tailed)	< .001	< .001

a. Wilcoxon Signed-Rank Test
b. Based On Negative Ranks

The collected data were then analyzed using statistical software. Quantitative data analysis of 68 students showed an increase in English vocabulary scores after the implementation of GBL. In Cycle 1, the average pretest score increased from 63.38 (SD = 16.430) to 79.56 in the posttest, indicating an increase of 16.18 points. In Cycle 2, the average pretest score increased from 92.35 to 97.94 in the posttest, indicating an increase of 5.59 points.

The results of the Wilcoxon signed-rank test in SPSS showed a significant difference between pretest and posttest scores in both cycles. In Cycle 1, $Z = -5.898$, $p < 0.001$, indicated a statistically significant improvement in pretest-to-posttest scores after implementing GBL. In Cycle 2, $Z = -3.800$ and $p = 0.001$ also showed a significant improvement. Based on the Wilcoxon test results, the significance value Asymp. Sig. (2-tailed) was 0.001, which is smaller than 0.05 ($0.001 < 0.05$).

The Implementation of Game-Based Learning on Students' Self-Regulated Learning in the Planning Phase

The researcher conducted semi-structured interviews with 8 students, including 2 representatives from each class. The 8 samples were selected purposely. The researcher selected students with the highest posttest scores and good communication skills to obtain more complete and detailed data during the interviews. In the planning phase, the researcher focused on how students prepared themselves to learn and complete tasks. The questions asked concerned what students prepared before studying and the strategies they used to complete assignments. Most students demonstrated simple and situational planning. They tended not to create formal study schedules or lists, but still maintained consistent daily study hours with the help of parents or tutors. Students also showed early abilities in planning their learning, although still in a simple form. Some students demonstrated learning preparation by gathering the necessary tools. Participants are addressed using name abbreviations; their responses are as follows:

> "Usually, I prepare my drink and books." (CH)
> "I prepare my notes and books, miss. Notes from school about what we will study tomorrow." (MA)
> "It should be books and notes, but sometimes I only study from my phone because there are materials sent during tutoring." (S)

 This is an open access article under the CC BY license

"I have to stay away from my phone when I study, so I usually ask my mom to keep my phone first because otherwise I'll keep looking at it." (MR)

After interviewing the 8 students, the researcher found that some students demonstrated planning skills by recognizing the kinds of situations they needed and those they should avoid while studying. The researcher asked questions about the kind of atmosphere they preferred while studying, whether silence or music, and whether they needed to study alone. The answers were quite balanced; some students preferred quiet, some preferred music to motivate them, and a few felt they needed an adult figure to accompany them.

"I feel more motivated if there are voices around because music makes me excited." (MR)
"I have to study alone in my room, or only with my mom so it's calm." (CL)
"I like silence. Music distracts me." (MA)
"I have to study with my mom because she has notes about what to study." (O)

Related to planning abilities, the researcher also wanted to see whether students had planning skills in completing assignments during the GBL learning process. The researcher asked, "When working on assignments, do you have a special strategy, such as doing certain parts first so you can finish faster?" Students then explained their strategies and reasons for choosing them.

"I prefer doing the difficult ones first… so later it won't feel difficult anymore. Then it becomes easier." (MR)
"I do the easy ones first so I can finish quickly. Then I'll still have plenty of time for the difficult ones." (S)
"The easy ones first, so I can finish faster, then the difficult ones." (O)
"I usually study first and do the difficult ones first because they take more time, while the easy ones can be done quickly." (MI)

One student explained that they had become familiar with the question patterns because answers to easier questions could often be found within the more difficult tasks:

"Because usually the answers for the easy tasks are inside the material for the difficult tasks, so I can look for them at the same time." (CL)

The variety of learning strategies—from preparing tools, organizing the learning atmosphere, to deciding the order of completing assignments—shows that students possessed awareness of planning. However, the planning was still very simple and not yet written down. In the planning phase, students' independence was visible through their initiative to prepare learning tools, create a comfortable atmosphere, and determine the order of tasks based on personal considerations.

The Implementation of Game-Based Learning on Students' Self-Regulated Learning in the Monitoring Phase

In the monitoring phase, the researcher focused on how students dealt with difficulties while working, adjusted strategies to understand material, and managed distractions during learning. Students' responses showed active awareness of their understanding levels and how they adjusted their reading speed based on the text's difficulty. The questions focused on what students did when they encountered difficulties and what efforts they made to overcome them. Students demonstrated the ability to manage and recognise their own learning methods. Most students sought help from people close to them, such as tutors, classroom teachers, and parents.

"No, I ask my mom directly. So when I study, I look at the book and ask, 'Mom, what does this mean?' Then she explains the new words." (MR)
"If I don't understand the assignment, I just do it slowly and ask, 'Mom, what does this mean?' Then she explains it." (O)

An interesting finding was that although students sought help from others, they also demonstrated independence by explaining that example questions were used as references and that they usually tried solving problems first before asking for help.

This is an open access article under the CC BY license

"I ask my tutor during tutoring sessions or search on Google too. If something is difficult, I don't just skip it, but ask about it." (MI)
"I ask my parents directly." (CL)
"I try to do it first, and if I still can't, then I ask my mom or dad." (LY)
"Usually, I take a photo of the question and send it to my tutor. If I really don't understand, then I ask the teacher." (S)

Managing distractions is also part of the monitoring phase. In this section, the researcher wanted to see students' awareness of external factors that could hinder their concentration and the solutions they applied. Some students showed high awareness of how distractions affected their learning.

"When I'm studying, no one is allowed to enter my room. I also have to keep my phone far away because it distracts me a lot and makes me want to keep playing with it." (S)

This statement shows that the student already had independent awareness of factors that could hinder learning and the ability to regulate the environment accordingly.

Another student showed parental involvement in managing distractions such as phones and television. The student stated:

"For me, everything has to be ready first—books, notes, and other supplies. But my phone is taken away by my mom or the TV remote is hidden so I can focus." (MI)

The statement above indicates that students' monitoring efforts came not only from themselves but also from parental support. This means that their monitoring abilities were still developing and required guidance. Monitoring skills are important in the SRL phase because a conducive environment enables the monitoring process to function more effectively.

The Implementation of Game-Based Learning on Students' Self-Regulated Learning in the Evaluation Phase

In the evaluation phase, the researcher wanted to observe students' activities after studying or receiving results. The targeted abilities included how students reflected on their efforts, analyzed the causes of success or failure, and made future decisions. In this phase, students were asked what they did if they received unsatisfactory learning results. The researcher found that most students reviewed the material again to correct their mistakes.

"I try to fix it, rewrite it, and study harder." (O)
"I review it again. If it's wrong, my mom tells me to study that part again." (CH)
"My mom says it's okay; we can just repeat it again and again." (MA)

Besides observing students' responses to failure, the researcher also wanted to see how students interpreted failure and whether they could think of future strategies. Students were asked, "When exam results come out and there are wrong answers, what do you do?" Two students admitted that effort does not always lead to immediate success.

"That happened a lot, especially during the mid-test (UTS). Final tests (UAS) are usually easier and the results are better." (CL)
"I once got a score of 60 in English, and I felt really disappointed. So I studied again, and in March I plan to take additional English tutoring." (S)

Student S's statement not only showed reflection that hard work does not always produce good results but also demonstrated a strategy for future improvement. Meanwhile, another student emphasized the importance of adults in developing evaluation skills. The student stated:

"It depends on how I study. According to my mom, if I study carefully, I can get good grades. Usually, I review it again, then my mom scolds me. When she drives me in the car, she brings the worksheet and asks me questions again." (MA)

Overall, the qualitative interview findings demonstrate that high-performing students possess emerging self-regulated learning (SRL) abilities across all three key phases. While SRL patterns are forming amongst these 4th grade students, external influences (such as tutors and parents) remain a large

force of influence. During the planning phase, students exhibited task awareness in how they prioritized tasks based on what study habits worked best for them and the tasks difficulty. In the monitoring phase, the students recognized personal distractions and showed self-awareness of learning distractions; however, the majority of students still relied on external support from parents or tutors when overcoming difficulties. Lastly, in the evaluation phase, students verbalised how they reflect on their performance by reviewing errors and strategizing how to improve. Taken together, while the game-based learning fostered reflective thinking and strengthened vocabulary understanding, students' SRL strategies remain in a transitional stage, relying on co-regulation from adults to gradually develop into fully autonomous habits.

CONCLUSIONS

Based on the quantitative analysis, implementing game-based learning improves fourth-grade students' mastery of English vocabulary. The Wilcoxon test showed statistically significant improvements across the two interventions, with moderate to large effect sizes ($r = 0.715$ and $r = 0.461$). Therefore, the hypothesis (Ha) was supported, indicating that game-based learning significantly affects English vocabulary mastery. Based on qualitative data analysis, the game-based learning method also contributed to developing students' self-regulated learning abilities. This is evident in interview findings that showed active engagement in planning (preparing learning tools and the environment), monitoring (addressing difficulties), and evaluation (reflecting on mistakes and planning future improvements). Students' self-regulated learning abilities remained simple and required adult guidance. However, this indicates that game-based learning can facilitate the development of self-regulated learning by creating an enjoyable, safe, and challenging learning environment. Game-based learning facilitates self-regulated learning by offering immediate feedback and structured task constraints inherent to game design. Game design encompassed time limits, locked objectives, and immediate scoring in the crossword and escape room tasks. These created structured constraints that required students to actively plan their approach and prioritise tasks based on difficulty. Furthermore, the immediate feedback during gameplay (such as instantly knowing whether an answer allows progress or fails) prompted students to monitor their comprehension in real time and adjust their strategies on the spot. The game-based environment encourages young learners to practice autonomous decision-making and reflective problem-solving in the classroom in a low-stakes, non-threatening setting. As the qualitative phase showed, SRL habits are forming in their study patterns, even with external influence. GBL invites students to learn into a safe and low-stakes learning environment that directly fosters SRL habits, which hopefully will continue to shape their learning habits as they continue to form internal study habits and learning motivation.

Future researchers should use a control-group design to compare the effectiveness of game-based learning methods with conventional methods. The intervention duration should also be extended to measure the development and formation of self-regulated learning more consistently. Researchers should include larger, more diverse samples so the results are not limited to a particular group. It is also recommended to compare digital and non-digital game-based learning in measuring long-term vocabulary mastery and more complex self-regulated learning abilities

REFERENCES

Alharbi, K. (2024). Enhancing technical vocabulary acquisition: A multimedia strategic approach for English for specific purposes during COVID-19. *Interactive Learning Environments, 32*(9), 4812–4830. https://doi.org/10.1080/10494820.2023.2205902

Andari, I. A. M. Y. (2023). Factors influence the acquisition of vocabulary by young learners. *Kumarottama: Jurnal Pendidikan Anak Usia Dini, 2*(2), 153–166. https://doi.org/10.53977/kumarottama.v2i2.833

Ardi Afriansyah, A., Baehaqi Arif, D., & Rona Islam, K. (2024). Development of Civics learning through COLAKTRA (Congklak Nusantara) innovation as a traditional game-based learning media. *Journal of Insan Mulia Education, 2*(1), 10–18. https://doi.org/10.59923/joinme.v2i1.93

Arsyad, M. (2024). Harnessing Wordwall for enhanced vocabulary acquisition and engagement in non-formal elementary education. *Journal of Languages and Language Teaching, 12*(4), 2064. https://doi.org/10.33394/jollt.v12i4.12020

This is an open access article under the CC BY license |

Bouzaiane, B., & Youzbashi, A. (2024). The role of digital-game based language learning in EFL vocabulary learning and retention: A case study at a higher educational institute in Oman. *Journal of Language Teaching and Research, 15*(5), 1660–1669. https://doi.org/10.17507/jltr.1505.27

Chao, C., & Fan, S. (2020). The effects of integrating board games into ice-breaking activities in a fifth-grade English class to reduce students' anxieties. *English Language Teaching, 13*(9), 40. https://doi.org/10.5539/elt.v13n9p40

Chen, Y. (2024). Effects of technology-enhanced language learning on reducing EFL learners' public speaking anxiety. *Computer Assisted Language Learning, 37*(4), 789–813. https://doi.org/10.1080/09588221.2022.2055083

Daud, D., Peng Hwa, C., Ahmad, H., Ee How, H., Jincheng, Z., & Saidalvi, A. (2022). Exploring the causes of fear of foreign language learning. *International Journal of Academic Research in Business and Social Sciences, 12*(10), 3210–3223. https://doi.org/10.6007/IJARBSS/v12-i10/15163

Decraene, E., Montero Perez, M., & Van Keer, H. (2025). L2 vocabulary learning through interactive book reading and factors that affect learning in emergent bilingual elementary school children. *Journal of Multilingual and Multicultural Development*, 1–18. https://doi.org/10.1080/01434632.2025.2601801

Ficayuma, L. A. (2023). Pelatihan decoding texts untuk mengembangkan penguasaan kosakata bahasa Inggris dan kemampuan penerjemahan siswa. *Pamasa: Jurnal Pengabdian Pada Masyarakat, 1*(1), 25. https://doi.org/10.20884/1.pamasa.2023.1.1.8817

Frolli, A., Cerciello, F., Esposito, C., Russo, M., & Bisogni, F. (2023). Learning Italian as a second language in a sample of Ukrainian children: A game-based learning approach. *Pediatric Reports, 15*(3), 502–511. https://doi.org/10.3390/pediatric15030046

Haryadi, R. N. (2022). The effect of vocabulary mastery and learning motivation towards description writing ability. *JEdu: Journal of English Education, 2*(1), 88–94. https://doi.org/10.30998/jedu.v2i1.6430

Hsu, T.-C., Chang, C., & Jen, T.-H. (2023). Artificial intelligence image recognition using self-regulation learning strategies: Effects on vocabulary acquisition, learning anxiety, and learning behaviours of English language learners. *Interactive Learning Environments*, 1–19. https://doi.org/10.1080/10494820.2023.2165508

Hussein, M. H., Ow, S. H., Cheong, L. S., & Thong, M.-K. (2019). A digital game-based learning method to improve students' critical thinking skills in elementary science. *IEEE Access, 7*, 96309–96318. https://doi.org/10.1109/ACCESS.2019.2929089

Jaiswal, P. (2024). *Enhancing vocabulary acquisition through gamification*. https://doi.org/10.32388/PCLDA3.2

Jensen, C. J. D., & Cadierno, T. (2024). Differences in mobile-assisted acquisition of receptive and productive vocabulary knowledge: A case study using Mondly. *The Language Learning Journal, 52*(3), 255–270. https://doi.org/10.1080/09571736.2022.2108123

Kieseier, T., Thoma, D., Vogelbacher, M., & Holger, H. (2022). Differential effects of metalinguistic awareness components in early foreign language acquisition of English vocabulary and grammar. *Language Awareness, 31*(4), 495–514. https://doi.org/10.1080/09658416.2022.2093888

Kırkgöz, Y. (2026). Professional development for out-of-field teachers of English for Academic Purposes. *Professional Development in Education*, 1–21. https://doi.org/10.1080/19415257.2026.2665198

Lai, C.-J. (2026). Evaluating generative AI-assisted inquiry-based learning and metacognitive scaffolding for enhancing scientific vocabulary, content comprehension, and lab report writing. *Interactive Learning Environments, 34*(5), 3596–3610. https://doi.org/10.1080/10494820.2025.2572786

Li, X., Xia, Q., Chu, S. K. W., & Yang, Y. (2022). Using gamification to facilitate students' self-regulation in e-learning: A case study on students' L2 English learning. *Sustainability, 14*(12), 7008. https://doi.org/10.3390/su14127008

Lu, H., & Ha, Z. Y. A. (2025). English academic writing for academic purposes and beyond: The experiences of undergraduate students in Hong Kong. *Critical Inquiry in Language Studies, 22*(3), 258–281. https://doi.org/10.1080/15427587.2024.2381522

Metsala, J. L. (2026). The effects of integrated ELA–science versus storybook instruction on early elementary students' vocabulary learning. *Reading Psychology, 47(*5), 854–868. https://doi.org/10.1080/02702711.2026.2630774

Mohamed, R. A. A. (2026). Enhancing academic English vocabulary learning through augmented reality and multimodal input. *International Journal of Adolescence and Youth, 31*(1), 2659778. https://doi.org/10.1080/02673843.2026.2659778

Murai, Y., Ikejiri, R., Yamauchi, Y., Tanaka, A., & Nakano, S. (2023). Design strategies to integrate creative learning in elementary school curricula through computer programming activities. *Interactive Learning Environments, 31*(7), 4698–4712. https://doi.org/10.1080/10494820.2021.1979048

Nguyen, H. A. (2026). Vocabulary acquisition in young EFL learners: A thematic review of strategies, media, and outcomes. *International Journal of Language Instruction, 5*(1), 45–58. https://doi.org/10.54855/ijli.26513

Palacios, N., & Kibler, A. (2016). Oral English language proficiency and reading mastery: The role of home language and school supports. *The Journal of Educational Research, 109*(2), 122–136. https://doi.org/10.1080/00220671.2014.927341

Rahmanu, I. W. E. D., & Molnár, G. (2024). Using spherical video-based immersive virtual reality technology to investigate vocabulary mastery among university sophomores in EFL settings. *Cogent Education, 11*(1), 2425226. https://doi.org/10.1080/2331186X.2024.2425226

Rasool, U., Qian, J., & Aslam, M. Z. (2023). An investigation of foreign language writing anxiety and its reasons among pre-service EFL teachers in Pakistan. *Frontiers in Psychology, 13*, 947867. https://doi.org/10.3389/fpsyg.2022.947867

Rosemary, C. A., & Abouzeid, M. P. (2002). Developing literacy concepts in young children: An instructional framework to guide early literacy teaching. *Journal of Early Childhood Teacher Education, 23*(2), 181–201. https://doi.org/10.1080/1090102020230210

Sadan, M., Lipka, O., & Katzir, T. (2026). Students' emotional experiences and learning outcomes during digital vocabulary instruction: Comparing struggling and typical third grade readers. *Computer Assisted Language Learning, 39*(1–2), 364–393. https://doi.org/10.1080/09588221.2024.2382452

Safrida, S., Harahap, S. A., & Ramadhan, N. (2024). Pengaruh metode game based learning terhadap minat belajar siswa pada mata pelajaran matematika di kelas V SDN 060799 Medan Labuhan. *Tematik: Jurnal Penelitian Pendidikan Dasar, 3*(1), 90–93. https://doi.org/10.57251/tem.v3i1.1488

Schmitt, N. (2008). *Vocabulary in language teaching* (10th ed.). Cambridge University Press.

Shi, Y. (2025). Leveraging digital literacy and gamification for English language acquisition: A comprehensive study of digital media's role in education. *International Journal of Inclusive Education*, 1–40. https://doi.org/10.1080/13603116.2025.2567431

Soriano-Sánchez, J. G., Quijano López, R., & Airado Rodríguez, D. (2026). The impact of game-based learning on motivation, self-efficacy, and academic achievement in the natural sciences: A meta-analysis. *Education Sciences, 16*(1), 122. https://doi.org/10.3390/educsci16010122

Soyoof, A., Reynolds, B. L., Shadiev, R., & Vazquez-Calvo, B. (2024). A mixed-methods study of the incidental acquisition of foreign language vocabulary and healthcare knowledge through serious game play. *Computer Assisted Language Learning, 37*(1–2), 27–60. https://doi.org/10.1080/09588221.2021.2021242

Tang, J. T. (2023). Comparative study of game-based learning on preschoolers' English vocabulary acquisition in Taiwan. *Interactive Learning Environments, 31*(4), 1958–1973. https://doi.org/10.1080/10494820.2020.1865406

Weng, C., Puspitasari, D., Rathinasabapathi, A., & Kuo, A. (2022). Reflective learning as an important key to the success of an online course. *Behaviour & Information Technology, 41*(15), 3382–3398. https://doi.org/10.1080/0144929X.2021.1988145

Wu, J. G., Zhang, D., Lee, S.-M., & Xian, J. (2025). Game on! Digital gaming and augmented reality/virtual reality in language learning. *International Journal of Computer-Assisted Language Learning and Teaching, 15*(1), 1–15. https://doi.org/10.4018/IJCALLT.367601

Wu, W.-C. V., Lin, R. P., & Darmawansah, D. (2025). Effects of augmented reality-supported experiential learning on low-achieving EFL students in rural elementary school. *Innovation in Language Learning and Teaching*, 1–23. https://doi.org/10.1080/17501229.2025.2510522

Yang, Y.-F., Hsieh, W.-M., Wong, W.-K., Hong, Y.-C., & Lai, S.-C. (2024). Reducing students' foreign language anxiety to improve English vocabulary learning in an online simulation game. *Computer Assisted Language Learning, 37*(3), 410–432. https://doi.org/10.1080/09588221.2022.2039203

Yang, Y.-F., Lee, I.-C., Tseng, C. C., & Lai, S.-C. (2025). Developing students' self-regulated learning strategies to facilitate vocabulary development in a digital game-based learning environment. *Journal of Research on Technology in Education, 57*(5), 972–991. https://doi.org/10.1080/15391523.2024.2338092

This is an open access article under the CC BY license |

Yustiani, B., Susanti, L. R., Safitri, E. R., & Gulo, F. (2024). Studi komparatif sistem pendidikan Indonesia dengan Finlandia. *LEARNING: Jurnal Inovasi Penelitian Pendidikan dan Pembelajaran, 4*(4), 1025–1035. https://doi.org/10.51878/learning.v4i4.3487

 This is an open access article under the CC BY license