

# The Influence of Using Digital Games on the Games to Learn English Website on Elementary School Students' English Vocabulary Mastery

Siti Hanisa Mulyani <sup>(1\*)</sup> Nadia Tiara Antik Sari <sup>(2)</sup> Wina Mustikaati <sup>(3)</sup>

<sup>(1,2,3)</sup> Department of Elementary School Teacher Education, Universitas Pendidikan Indonesia, Purwakarta, Indonesia

Received: 2026, 05,03 Accepted: 2026, 05,17  
Available online: 2026, 07, 01

\*Corresponding author.  
E-mail addresses: h2n0i0s3a@upi.edu

KEYWORDS	ABSTRACT
<p><b>Keywords:</b> Games to Learn English; English vocabulary mastery; game-based learning; elementary school students; comparative adjectives</p> <p><b>Conflict of Interest Statement:</b> The author(s) declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.</p> <p>Copyright © 2026 EDU. All rights reserved.</p>	<p>Vocabulary mastery is an essential component of learning English, yet elementary school students often face challenges in lexical competency. This study aims to evaluate how digital games on the Games to Learn English website affect and improve fifth-grade students' understanding of Comparative Adjectives vocabulary. A pre-experimental method with a One-Group Pretest-Posttest Design was employed, involving 32 fifth-grade students at SDN 2 Mulyamekar Purwakarta. Data were collected through observation sheets and assessments measuring vocabulary indicators: Pronunciation, Meaning Recognition, Spelling Accuracy, and Contextual Usage. The findings showed that the mean score increased from 67.44 in the pre-test to 72.50 in the post-test. The Wilcoxon Signed Ranks Test confirmed a significant impact (Asymp. Sig. 0.042 &lt; 0.05). Although the N-Gain score averaged 0.0590 (5.9%), placing it in the low category due to high baseline pre-test scores, the website remains an effective learning alternative. This study implies that digital game-based learning can enhance vocabulary mastery, though future research should consider extending treatment duration and adjusting digital media to better meet students' affective needs in the classroom.</p>

## Introduction

English has evolved into a global lingua franca dominating economics, science, and technology, making its mastery a primary prerequisite for developing competitive talent in the digital job market.[1] Based on this urgency, laying the foundation of English should ideally begin in elementary school, where students are in an age phase responsive to linguistic input, making foreign language acquisition more natural and effective than in adulthood.[2] Thus, early learning builds a more mature basis for communication skills to face global competition.[3] Vocabulary is the ultimate foundation in the language acquisition process, which influences students' success in mastering the four language skills: listening, speaking, reading, and writing.[4] Without an adequate vocabulary, messages cannot be conveyed effectively even if grammar is well understood.[5] Therefore, vocabulary mastery is a crucial aspect at the elementary school level to ensure students can express ideas accurately and efficiently.[6]

Preliminary observations at SDN 2 Mulyamekar showed low vocabulary mastery among the fifth-grade class, which consisted of 38 registered students. This was also evident from the pre-test results, which fell below the minimum standard with an average score of only 67.44. This problem arose due to a lack of repetitive stimuli and structural constraints in understanding "Comparative Adjectives" materials. The structural differences between English and Indonesian often trigger mother-tongue interference, causing students difficulty in constructing comparative sentences correctly.[7] If not promptly addressed, these structural barriers and low retention will hinder students' English

competence achievement in subsequent levels. Due to student absenteeism during the testing periods, 32 students actively completed both the pre-test and post-test, serving as the final research subjects.

As a solution, this study proposes the utilization of the "Games to Learn English" website, a game-based learning platform offering organized materials across various topics, including games themed around "Comparative Adjectives." Through native speaker pronunciation and instant feedback features, this website provides a multisensory learning experience capable of enhancing students' vocabulary retention.[8] This medium was also chosen because it is open-access without complicated registration, thereby supporting sustainable independent learning and ensuring equity of access without subscription fee constraints.[9] Furthermore, audiovisual media and interactive applications have been proven to increase motivation and vocabulary retention compared to traditional methods, aligning with the characteristics of Alpha generation students who are highly responsive to technology.[10]

Based on the problems and potential solutions described, this study aims to examine the effectiveness of using digital games on the Games to Learn English website to improve fifth-grade elementary school students' English vocabulary mastery, specifically focusing on Comparative Adjectives materials.

## Research Design and Methodology

This study employed a quantitative approach with a pre-experimental design, specifically utilizing the one-group pretest-posttest structure. This design was selected to evaluate the direct impact of an intervention within a single classroom setting without requiring a control group, thereby maintaining the natural learning environment of the school. The independent variable in this research was the implementation of digital game-based learning via the *Games to Learn English* platform, featuring three specific games: *Monster Vocab*, *Spelling Bee*, and *Monster Phrases*. The dependent variable was the students' English vocabulary mastery, focusing conceptually on comparative adjectives.

The population for this study comprised all fifth-grade students at SDN 2 Mulyamekar Purwakarta during the 2025/2026 academic year. Total sampling (sampling jenuh) was initially applied to include the entire population of 38 students. However, due to student absences during the testing periods, the final active sample size utilized for complete statistical analysis consisted of 32 students.

Data collection was carried out through testing and structured observation techniques to obtain comprehensive quantitative and qualitative insights. The primary instrument was a vocabulary mastery test deployed in two phases: a pre-test to measure students' baseline proficiency before the intervention, and a post-test administered after the treatment to evaluate the impact of the digital game-based learning platform. The test items were directly aligned with the *Kurikulum Merdeka* Phase C Learning Outcomes (CP) for fifth-grade English, focusing on Unit 8 ("The Giraffe is Taller than the Deer") with the objective of enabling students to use comparative adjectives. The structural blueprint of the pre-test and post-test instruments is detailed in Table 1.

**Table 1.** Structural Blueprint of Vocabulary Mastery Pre-test and Post-test Instruments.

No	Vocabulary Indicators	Cognitive Level	Item Type	Item Numbers
1	Meaning Recognition (Identifying comparative adjectives based on pictures)	C2	Multiple Choice	1 & 3
2	Contextual Usage (Completing blank sentences based on situational contexts)	C3	Multiple Choice	2 & 6
3	Meaning Recognition (Interpreting sentences to match visual stimuli)	C2	Multiple Choice	4 & 5
4	Spelling Accuracy (Arranging scrambled letters)	C3	Fill-in-the-blank	7-10

	into meaningful words)			
5	Contextual Usage (Arranging scrambled words into structured sentences)	C3	Fill-in-the-blank	11-14
6	Pronunciation (Producing spoken comparative adjectives based on pictures)	C5	Oral Test	15-20

Source: Research Data (2026)

The written test items (1-14) were scored using a structured rubric based on spelling accuracy and word order correctness. Meanwhile, the oral test items (15-20) evaluated student pronunciation using a 6-point rating scale ranging from 0 (No Response) to 6 (Very Clear articulation). In addition to tests, structured observations were conducted across three treatment sessions utilizing teacher and student observation checklists. The teacher's checklist monitored adherence to the Game-Based Learning syntax—specifically using *Monster Vocab* in the first session, *Spelling Bee* in the second, and *Monster Phrases* in the third. Concurrently, the student's checklist recorded student engagement, discipline, and behavioral responses during game interaction. The implementation success of both teacher and student activities was categorized into four percentage intervals: 0%-25% (Poor), 26%-50% (Fair), 51%-75% (Good), and 76%-100% (Very Good).

To ensure the technical quality of the 20-item vocabulary mastery test, both qualitative and quantitative calibrations were executed. Content validity was qualitatively established through expert judgment by an English education expert, confirming that the test layout properly evaluated the four target indicators: Meaning Recognition, Spelling Accuracy, Contextual Usage, and Pronunciation. Empirical validation was subsequently conducted via a try-out on sixth-grade students, with data processed using Anates software.

The item analysis revealed that all 6 multiple-choice items (featuring options A, B, C, and D) and 14 short-answer/oral items were statistically valid, with correlation coefficients indicating moderate to very high validity. Reliability testing demonstrated high internal consistency, yielding coefficients of 0.82 for the multiple-choice section and 0.97 for the short-answer and oral sections. Furthermore, all test items displayed satisfactory item discrimination indexes—categorized as good or very good—and fell within an ideal medium difficulty index range (0.30 to 0.70), confirming their structural suitability for data collection.

Data analysis was performed using descriptive and inferential statistical methods via IBM SPSS Statistics 24 software. Descriptive statistics were utilized to determine the mean scores and standard deviations of both the pre-test and post-test data, allowing for an initial assessment of data characteristics. Inferential analysis was subsequently employed to test the research hypotheses. The Shapiro-Wilk method was selected as the normality prerequisite test at a significance level of  $\alpha = 0.05$ , where a  $P$ -value  $> 0.05$  indicates normally distributed data. To evaluate the magnitude of student improvement in vocabulary mastery after interacting with the digital games, Normalized Gain (N-Gain) scores were computed. Finally, to determine the statistical significance of the differences between the pre-test and post-test scores, non-parametric analysis via the Wilcoxon Signed Ranks Test was executed. The statistical decision to reject the null hypothesis ( $H_0$ ) and accept the alternative hypothesis ( $H_a$ ) was based on a probability threshold of  $P$ -value  $< 0.05$ .

## Findings and Discussion

### Findings

The empirical findings of this study are structured to present the quantitative and qualitative data gathered during the research timeline, spanning from May 11 to May 25, 2026. This section encompasses the descriptive statistics of the pre-test and post-test scores, the tracking of student

performance across four core vocabulary mastery indicators, the results of structured classroom observations, and the inferential statistical analyses used to test the research hypothesis.

### Descriptive Statistics of Vocabulary Mastery

The baseline data collected during the pre-test phase revealed the initial proficiency of the 32 active fifth-grade students regarding English comparative adjectives. Following the three-session intervention using the digital game-based platform *Games to Learn English*, a post-test was administered to evaluate changes in student performance. A comprehensive summary of the descriptive statistics comparing both testing phases is presented in Table 2.

**Table 2.** Descriptive Statistics of Pre-test and Post-test Scores.

Test Phase	Minimum	Maximum	Mean ( <i>M</i> )	Std. Deviation
Pre-test	31	93	67.44	18.684
Post-test	37	95	72.50	15.658

*Source: Processed Research Data (2026).*

As detailed in Table 2, the mean score shifted positively from  $M = 67.44$  in the pre-test to  $M = 72.50$  in the post-test. Additionally, the minimum score rose from 31 to 37, while the maximum score increased from 93 to 95. The reduction in the standard deviation from  $SD = 18.684$  to  $SD = 15.658$  indicates that the post-test scores were more tightly clustered around the mean, reflecting a more homogenous distribution of vocabulary proficiency across the classroom after the treatment.

### Vocabulary Mastery Enhancement by Indicators

The student performance was further analyzed across four core vocabulary mastery indicators: Meaning Recognition, Spelling Accuracy, Contextual Usage, and Pronunciation. This granular analysis aimed to track how the digital game-based intervention stimulated both receptive and productive foreign language skills. The cumulative score breakdown for each indicator before and after the intervention is illustrated in Table 3.

**Table 3.** Cumulative Score Progress across Vocabulary Indicators

No	Vocabulary Indicators	Target Digital Media Module	Pre-test Score	Post-test Score	Score Margin
1	Meaning Recognition	Monster Vocab	246	258	+12
2	Spelling Accuracy	Spelling Bee	582	612	+30
3	Contextual Usage	Monster Phrases	542	612	+70
4	Pronunciation	Oral Flashcards (Teacher Section)	788	855	+67

*Source: Processed Research Data (2026)*

As shown in Table 3, positive growth was consistently recorded across all language components. The most substantial increase occurred within the Contextual Usage indicator, which surged by 70 points. This was closely followed by the Pronunciation indicator, which improved by 67 points. Spelling Accuracy and Meaning Recognition demonstrated more conservative yet steady growth, with increases of 30 points and 12 points, respectively.

### Classroom Observation Results

To supplement the quantitative testing metrics, qualitative insights were captured via structured observation checklists during the three intervention sessions. The execution of the Digital Game-Based

Learning (DGBL) framework was monitored by an observer to evaluate teacher instructional fidelity and student behavioral engagement. The chronological progression of classroom implementation is compiled in Table 4.

**Table 4.** Chronological Progression of Classroom Observation Scores

Session	Date (2026)	Active Digital Game Module	Teacher Fidelity (%)	Student Engagement (%)
Treatment 1	Wednesday, May 13	Monster Vocab & Oral Flashcards	88%	87%
Treatment 2	Wednesday, May 20	Spelling Bee & Oral Flashcards	92%	94%
Treatment 3	Thursday, May 21	Monster Phrases & Oral Flashcards	100%	100%

Source: Processed Research Data (2026)

The observation metrics in Table 4 illustrate a linear upward trend in both teaching quality and student engagement across the intervention timeline. In the first session, the teacher achieved an 88% fidelity rate, primarily hindered by initial technical setup delays and prolonged game demonstrations. Consequently, student engagement stood at 87% due to mild confusion regarding the game rules. By the third session, both variables reached a perfect score of 100%, indicating flawless adherence to the planned pedagogical scenario.

#### Inferential Statistical Analysis

To determine whether the observed increase in scores was statistically significant, a series of inferential tests were conducted. First, the Shapiro-Wilk normality test was executed due to the small sample size ( $N = 32$ ). The pre-test data was normally distributed ( $P = 0.053 > 0.05$ ), but the post-test data violated the normality assumption ( $P = 0.029 < 0.05$ ). Consequently, hypothesis testing was redirected from parametric alternatives to the non-parametric Wilcoxon Signed Ranks Test. The consolidated results of the hypothesis and effectiveness tests are summarized in Table 5.

**Table 5.** Wilcoxon Signed Ranks and N-Gain Test Results

Statistical Test	Parameter / Metrics	Value	Statistical Decision / Interpretation
Hypothesis Test (Wilcoxon)	Negative Ranks (N)	12	$H_0$ Rejected ( $P < 0.05$ ); Significant Effect Observed
	Positive Ranks (N)	19	
	Thursday, May 21	1	
	Ties (N)	-2.029	
	Z-value	0.042	
	Asymp. Sig. (2-tailed)		
Effectiveness (N-Gain)	Mean N-Gain Score	0.0590	Low Effectiveness Level
	Low Category Range (N)	26 (81.3%)	
	Medium Category Range (N)	6 (18.8%)	

Source: Processed Research Data (2026)

The Wilcoxon Signed Ranks Test outputs displayed in Table 5 yielded an asymptotic significance level of  $P = 0.042$ . Because the  $P$  - value is less than the alpha threshold ( $P < 0.05$ ), the null hypothesis ( $H_0$ ) is rejected, confirming that the integration of digital games on the *Games to Learn English* platform exerts a statistically significant effect on students' comparative adjectives vocabulary mastery.

However, the Normalized Gain (N-Gain) analysis demonstrates that the average N-Gain score for the classroom was 0.0590, which falls within the "Low" efficiency classification. Individually, the distribution frequency showed that 26 students (81.3%) fell into the low growth category, 6 students (18.8%) achieved medium growth, and no students reached high growth.

### **Discussion**

The statistical and observational insights gathered from this study establish that utilizing customized digital games significantly enhances fifth-grade students' foreign language lexical acquisition, though specific mathematical and behavioral constraints bound the overall rate of growth.

#### **Analysis of Baseline Lexical Barriers**

The initial pre-test results revealed a major pedagogical gap in the classroom, marked by a high standard deviation ( $SD = 18.684$ ) and 14 individual scores falling below the passing competency threshold ( $< 66$ ). Field observations identified that the primary catalyst for this initial deficiency was a severe cognitive barrier regarding the assessment format. Students experienced profound confusion because the test instructions and items were presented entirely in English. This unfamiliarity overwhelmed the young learners, preventing them from decoding the intent of the questions before they could even attempt to retrieve semantic answers. This outcome aligns with the assertions of Syamsidar et al. (2023), who posited that introductory foreign language material often appears excessively abstract to elementary students, inevitably inducing wide performance disparities if the classroom lacks adaptive instructional media.

A granular breakdown of the pre-test indicators highlighted that students performed best in Meaning Recognition (246 points) because concrete multiple-choice options (A, B, C, and D) provided essential structural scaffolding, enabling them to use passive memory recall without independently producing language units. Conversely, performance dropped in Spelling Accuracy (582 points) and Contextual Usage (542 points) where students had to independently construct words and phrases. Lacking interactive visual anchors, students frequently altered alphabetical sequences and produced disorganized sentences characterized by literal word-for-word translations from Indonesian to English that completely disregarded proper grammatical structures. This chaotic output corroborates Katemba's (2025) theory that without personalized and engaging contextual practice, a student's lexical memory fails to internalize functionally for real-world production. Pronunciation also suffered (788 points) due to high phonetic anxiety and a systemic lack of spoken English exposure in their habitual learning environment, exemplifying Katemba's (2025) finding that minimal spoken output loops directly degrade oral articulation accuracy.

#### **Technological Customization and Indicator Evolution**

To address these baseline disparities and lower foreign language anxiety, an interactive intervention was introduced utilizing targeted games from the *Games to Learn English* platform. Following the three sessions of gamified treatment, the post-test scores showed a positive shift, with the classroom mean rising to  $M = 72.50$  and the standard deviation narrowing to  $SD = 15.658$ . This statistical contraction indicates that the performance gap among students successfully shrunk, yielding a more uniform distribution of knowledge across the classroom. This outcome supports contemporary pedagogical consensus advocating for recreational, gamified frameworks to maximize lexical retention in young learners.

A pivotal element behind these quantitative gains was the structural customization engineered through the platform's "Teachers' Section". Recognizing that the website's default content only covered generic vocabulary sets, a custom content set designated as "Comparative\_Adj" was built to align directly with the target curriculum. This customization allowed the distribution of private

homework links that isolated student performance into dedicated group leaderboards (Groups 1-5). The real-time visibility of group standings ignited a healthy competitive environment, driving student engagement and focus during the classroom activities. Additionally, a non-competitive audio flashcard feature within the platform's *Vocab Viewer* served as a daily warming-up drill to scaffold verbal accuracy. By combining clear visual representations—such as contrasting the relative heights of a goat and a giraffe to illustrate the word "shorter"—with native audio playbacks, students could practice correct pronunciation and hide textual cues to test their auditory memory before transitioning into the main team games.

This customized digital game-based framework drove steady improvements across all four target indicators. In Meaning Recognition (258 points), regular interaction with the *Monster Vocab* module trained students to match adjectives with their visual meanings systematically, replacing speculative guessing with deliberate identification. In Spelling Accuracy (612 points), the repetitive kinetic and visual loops in the *Spelling Bee* module effectively reinforced the students' orthographic motor memory, sharply reducing letter omissions in complex comparative adjectives, as validated by Syamsidar et al. (2023).

The most substantial progress occurred in Contextual Usage (612 points), where guided sentence assembly inside the *Monster Phrases* module successfully disrupted literal native-language interference. Students transitioned from fragmented syntax to coherent, rule-compliant comparative constructions, producing correct sentence transformations such as "A cheetah runs faster than a snail" and "A snake is longer than a pencil". This progress demonstrates Katemba's (2025) principle that technology-mediated language application turns passive vocabulary into functional contextual communication. Finally, Pronunciation advanced to 855 points as the consistent acoustic modeling provided by the native speaker audio features built students' confidence, substantially reducing their hesitation and verbal anxiety while stabilizing their phonetic articulation of comparative forms, confirming Katemba's (2025) assertion that digital audio exposure directly improves speech accuracy.

### The N-Gain Paradox: Significance vs. Growth Limits

The rejection of the null hypothesis during the Wilcoxon Signed Ranks Test ( $P = 0.042 < 0.05$ ) confirms that the digital game-based intervention had a statistically significant effect on students' comparative adjectives mastery. Despite this clear statistical significance, an apparent paradox emerged during the Normalized Gain (N-Gain) analysis, which yielded an average classroom index of only 0.0590, placing the intervention's overall efficiency within the "Low" category according to Hake's criteria.

This low N-Gain index is primarily explained by a clear mathematical constraint. The pre-test baseline data showed that the class already possessed a relatively high initial mean score ( $M = 67.44$ ), with individual scores reaching up to 93. Because Hake's N-Gain formula utilizes the remaining potential headroom ( $100 - \text{pre-test score}$ ) as its denominator, a high initial pre-test score automatically shrinks the mathematical divisor. This restriction makes it exceptionally difficult to score a high N-Gain index, as the room for potential quantitative growth is heavily compressed from the start.

From a pedagogical perspective, these findings indicate that while short-term pre-experimental digital interventions provide an effective, low-anxiety environment for language learning, they do not automatically produce massive quantitative score jumps. The gamified elements in *Monster Vocab*, *Spelling Bee*, and *Monster Phrases* successfully established a highly collaborative classroom dynamic and rectified frustrating grammatical errors. However, to turn these short-term interactive gains into major academic growth, digital game-based learning should be sustained over longer periods and paired with explicit, teacher-led semantic scaffolding.

### Conclusion

The implementation of Game-Based Learning (GBL) through the *Games to Learn English* platform exerts a statistically significant effect on the English comparative adjectives vocabulary mastery of fifth-grade students at SDN 2 Mulyamekar Purwakarta. Prior to the intervention, students demonstrated a "Good" initial baseline with a mean score of 67.44, although their individual proficiency remained highly unequal. Following the treatment, a significant improvement was

observed as the majority of students (19 individuals) successfully raised their post-test scores, resulting in a positive mean shift to 72.50. While non-parametric inferential analysis confirmed a statistically reliable impact ( $P = 0.042 < 0.05$ ), the quantitative advancement rate was categorized as low with a collective Normalized Gain index of 0.0590 (5.9%), which was mathematically restricted by the students' high initial pre-test scores.

This study offers valuable contributions to the development of primary school English pedagogy by providing an empirical model for integrating interactive educational technology into classroom practices. The originality of this research lies in leveraging the platform's "Teachers' Section" customization feature to align generic digital game modules with targeted grammar competencies. Practically, these findings demonstrate that gamified learning can transform abstract comparative adjectives into accessible content, successfully establishing an interactive classroom environment, reducing foreign language anxiety, and serving as an effective instructional alternative for educators to cultivate young learners' lexical retention through enjoyable methods.

Despite its benefits, this study is bounded by specific limitations, primarily a short implementation timeline that directly constrained the potential for extreme quantitative score jumps and left student memory retention unexamined. Therefore, future researchers are highly encouraged to extend the intervention duration to allow for a deeper evaluation of long-term lexical durability. Additionally, future studies should investigate other critical variables that were not covered in this research, such as student learning motivation, or explore further modifications of the platform's adaptive features across diverse school contexts to ensure a broader development of game-based instructional strategies.

## Acknowledgment

The author expresses sincere gratitude to the principal, English teachers, and the fifth-grade students of **SDN 2 Mulyamekar Purwakarta** for providing the necessary research facilities, permission, and wonderful cooperation during the data collection process. Additionally, highest appreciation is extended to the thesis advisors for their invaluable guidance, constructive critiques, and meaningful suggestions in improving the quality of this article.

## References

- Alhazmi, K. 2024. "The Effect of Multimedia on Vocabulary Learning and Retention." *World Journal of English Language* 14 (6): 390-401. <https://doi.org/10.5430/wjel.v14n6p390>.
- Arikunto, Suharsimi. 2021. *Dasar-Dasar Evaluasi Pendidikan*. Edisi ke-3. Jakarta: Bumi Aksara.
- Bulu, M. M., N. P. A. Dewi, dan A. R. Fatmawan. 2025. "Integrating Learning Media to English Vocabulary Acquisition in Elementary School." *Riwayat: Educational Journal of History and Humanities* 8 (3): 1-12. <https://doi.org/10.24815/jr.v8i3.48389>.
- Celik, F., dan M. H. Baturay. 2024. "The Effect of Metaverse on L2 Vocabulary Learning, Retention, Student Engagement, Presence, and Community Feeling." *BMC Psychology* 12 (1): 1-15. <https://doi.org/10.1186/s40359-024-01549-4>.
- Haleem, A., M. Javaid, M. A. Qadri, dan R. Suman. 2022. "Understanding the Role of Digital Technologies in Education: A Review." *Sustainable Operations and Computers* 3: 275-285. <https://doi.org/10.1016/j.susoc.2022.05.004>.
- Hidayat, N., dan S. Suryadi. 2022. "Improving Student Learning Outcomes Through the Use of Digital Learning Media." *Jurnal Vokasi Informatika (JVIP)* 15 (1): 13-19. <https://doi.org/10.26418/jvip.v15i1.54889>.
- Katembera, Christianus V. 2025. "Role of Mobile-Assisted Language Learning in Improving Vocabulary Mastery Among EFL Students." *PEBSAS: Jurnal Pendidikan Bahasa dan Sastra* 3 (2): 60-66. <https://jurnal.insanciptamedan.or.id/index.php/pebsas>.
- Kodrlle, S., dan A. Savchenko. 2021. "Digital Educational Media in Foreign Language Teaching and Learning." *E3S Web of Conferences* 273: 12018. <https://doi.org/10.1051/e3sconf/202127312018>.
- Nadeem, M., M. Oroszlanyova, dan W. Farag. 2023. "Effect of Digital Game-Based Learning on Student Engagement and Motivation." *Computers* 12 (9): 177. <https://doi.org/10.3390/computers12090177>.
- Permana, N. S. 2022. "Game Based Learning Sebagai Salah Satu Solusi dan Inovasi Pembelajaran Bagi Generasi Digital Native." *JPAK: Jurnal Pendidikan Agama Katolik* 22 (2): 173-183. <https://doi.org/10.34150/jpak.v22i2.433>.
- Sonnenschein, S., M. L. Stites, H. Gursoy, dan J. Khorsandian. 2023. "Elementary-School Students' Use of Digital Devices at Home to Support Learning Pre- and Post-COVID-19." *Education Sciences* 13 (2): 117. <https://doi.org/10.3390/educsci13020117>.
- Syamsidar, R. M. P. Silalahi, A. Rusmardiana, F. Febriningsih, M. Taha, dan Erniwati. 2023. "Wordwall on Mastery of Vocabulary in English Learning." *Al-Ishlah: Jurnal Pendidikan* 15 (2): 1801-1806. <https://doi.org/10.35445/alishlah.v15i2.3466>.
- Wang, X., dan L. Feng. 2025. "Examining the Influential Mechanism of English as a Foreign Language (EFL) Learners' Flow Experiences in Digital Game-Based Vocabulary Learning: Shedding New Light on a Priori Proposed Model." *Education Sciences* 15 (2): 125. <https://doi.org/10.3390/educsci15020125>.