

Effectiveness Of Gamified Apps on the Vocabulary Development of Grade 12 Senior High School Students

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Publication history: Received: February 6, 2026; Revised: February 10, 2026; Accepted: February 16, 2026

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Abstract

This study determined the effectiveness of gamified applications on the vocabulary development of Grade 12 Senior High School students at Tomas Claudio Colleges during the School Year 2025–2026. Using an experimental research design, the study employed a randomized pretest–posttest control group design involving forty-eight (48) Humanities and Social Sciences (HUMSS) students. The respondents were described according to age, sex, sibling position, number of children in the family, parents' educational attainment, and monthly family income. A researcher-made vocabulary proficiency test consisting of thirty (30) items was utilized to measure word meaning in context, vocabulary application, and matching type skills. The experimental group was exposed to gamified vocabulary applications, namely Anki and Quizlet, while the control group received traditional vocabulary instruction without gamified elements. Findings revealed that both groups improved in their posttest performance; however, the experimental group obtained significantly higher mean scores compared to the control group. Results of the t-test showed significant differences between the pretest and posttest scores of both groups, confirming the effectiveness of the intervention. Moreover, one-way ANOVA results indicated no significant differences in the posttest performance of the experimental group when grouped according to profile variables, suggesting that gamified learning tools are effective regardless of demographic characteristics. The study concluded that gamified applications significantly enhance students' vocabulary proficiency, engagement, and motivation. Gamification creates an interactive, learner-centered environment that promotes active participation and long-term retention of vocabulary. It was recommended that teachers integrate gamified applications in vocabulary instruction and that school administrators provide professional development opportunities to support their implementation. Future studies may explore the long-term effects of gamification on other language skills.

Keywords: gamified learning, vocabulary development, Senior High School students, experimental research, language instruction, educational technology

1. Introduction

Education remains a fundamental driver of individual empowerment and national development, as it equips learners with the competencies necessary to navigate complex academic and real-world demands. In the Philippine context, Article XIV, Section 1 of the 1987 Constitution underscores the State's responsibility to provide a complete, adequate, and integrated system of education responsive to societal needs. In alignment with this mandate, the Department of Education strengthened technology integration through DepEd Order No. 16, s. 2023, or the DepEd Computerization Program (DCP), which promotes equitable access to ICT resources in public schools. These policy directions recognize digital technology as a strategic tool in enhancing teaching effectiveness and learner engagement. Among emerging digital strategies, gamification has gained increasing attention as an innovative pedagogical approach.

Gamification refers to the integration of game elements such as points, badges, leaderboards, progress tracking, and rewards into non-game learning environments to increase motivation, engagement, and performance. Foreign studies provide strong support for its educational value. Pollard (2025) found that gamified instruction enhanced motivation, collaboration, and critical thinking among university students. Grant (2021) highlighted its potential to foster agency, resilience, and self-directed learning. In the field of language learning, Kodabandeh et al. (2024) demonstrated that digital flashcards significantly improved academic vocabulary acquisition, while Rofiah and Waluyo (2024) reported that gamified platforms such as Quizlet positively influenced vocabulary learning, enjoyment, and reduced anxiety. Similarly, Topal (2024) confirmed that mobile-assisted gamified applications promote vocabulary retention and learner autonomy.

Local studies echo these findings. Samortin (2020) reported significant improvements in vocabulary retention through gamified learning activities. Lozarito and Segumpan (2022) found that digital vocabulary games enhanced both vocabulary proficiency and learner attitude. Duterte (2024) further emphasized that gamification significantly improves student engagement and academic performance in Philippine higher education settings.

Despite the growing body of literature supporting gamification, notable gaps remain. Many foreign studies focus on university or EFL contexts outside the Philippines, limiting their direct applicability to Filipino Senior High School learners. While local research confirms the benefits of gamified activities, limited studies specifically examine commercially available gamified vocabulary applications such as Anki and Quizlet in the Senior High School context. Moreover, few experimental studies using randomized pretest–posttest control group designs have been conducted to establish stronger causal evidence regarding vocabulary development. Addressing these gaps, the present study investigates the effectiveness of gamified applications on the vocabulary development of Senior High School students, contributing empirical evidence to support technology-enhanced language instruction in the Philippine educational setting.

2. Materials and methods

2.1 Research Design

The study applied the experimental method of research utilizing a randomized pretest and posttest control group design.

2.2 Research Setting

This study was conducted at Tomas Claudio Colleges (TCC), a non-sectarian institution located in Taghangin, Morong, Rizal.

2.3 Respondents

The respondents of the study were 48 HUMSS students who were described in terms of their age, sex, sibling position, number of children in the family, monthly family income, and parents' educational attainment. One HUMSS section was considered for the reliability testing of the researcher-made vocabulary proficiency test. Meanwhile, two other HUMSS sections were considered for the actual experimentation. The experimental group, composed of twenty-three (23) students, was exposed to the gamified vocabulary apps Anki and Quizlet, whereas the control group, also consisting of twenty-five (25) students, was not exposed to these apps.

2.4 Research Instruments

Parallel forms of a 30-item vocabulary pretest and posttest were administered to Grade 12 Senior High School students before and after their exposure to the gamified applications Anki and Quizlet. The tests, composed of multiple-choice and matching-type items, measured students' understanding of academic and professional vocabulary in terms of meaning, usage, and context. The same structure and level of difficulty were maintained in both tests to ensure consistency. Students' scores were interpreted using a proficiency scale ranging from Poor (1–6) to Outstanding (25–30). The researcher-developed instrument, aligned with the English for Academic and Professional Purposes (EAPP) curriculum, underwent content validation by a panel of experts, including the thesis adviser, lecturers, statistician, school administrators, and English specialists. Revisions were made based on their recommendations to ensure content relevance, clarity, and appropriate difficulty. Reliability testing produced a coefficient of 0.89, indicating high internal consistency and confirming that the instrument was both valid and reliable for measuring vocabulary proficiency.

2.5 Data Collection

The study followed a Gantt Chart of Activities to ensure systematic implementation. After securing approval from the school principal and obtaining participants' consent, the researcher conducted reliability testing of the instrument using a separate Grade 12 HUMSS section not included in the main study. Necessary revisions were made based on the results to finalize the instrument. Following validation and reliability testing, a pretest was administered to two purposively selected HUMSS sections assigned as the experimental (23 students) and control (25 students) groups. The experimental group received gamified vocabulary instruction through Anki and Quizlet, while the control group underwent conventional teaching without gamified applications. The intervention was implemented over a specified period during their English for Academic and Professional Purposes (EAPP) lessons. After the intervention, both groups took a posttest to measure changes in vocabulary proficiency. Collected data were encoded and analyzed using the Statistical Package for the Social Sciences (SPSS). Findings were interpreted based on the research objectives, leading to the formulation of conclusions and recommendations. The study strictly adhered to the Data Privacy Act of 2012, ensuring confidentiality and voluntary participation. The manuscript underwent anti-plagiarism screening and was revised according to the oral examination committee's recommendations before final submission.

2.6 Data Analysis

The data were analyzed using appropriate statistical tools. Frequency and percentage distribution were employed to describe the respondents' profile variables. Mean and standard deviation were used to determine the level of vocabulary performance of both the experimental and control groups based on their pretest and posttest results. An independent samples t-test was applied to determine significant differences in vocabulary performance between the two groups before and after the intervention, as well as to compare their posttest scores. Additionally, one-way Analysis of Variance (ANOVA) was utilized to examine whether significant differences existed in the posttest vocabulary performance of the experimental group when grouped according to their profile variables.

2.7 Ethical Considerations

The study ensured the protection of the rights and welfare of all respondents. Participation was voluntary, and respondents were informed about the purpose of the study. Confidentiality and anonymity of all information provided were strictly maintained, and data were used solely for research purposes. The researcher ensured that the respondents were treated with respect and that no harm, whether physical, emotional, or psychological, would result from their participation in the study..

3. Results and Discussion

3.1. Profile of the Students in the Control and Experimental Groups

As shown in the table, the majority of students in both the control and experimental groups are aged 17–18 years old, representing 84.0% and 91.3% respectively, indicating that most respondents belong to the typical age range of senior high school students. In terms of sex, females comprise a slightly larger proportion of the control group with 56.0% while males dominate the experimental group with 65.2%. With respect to sibling position, more than half of the students in both groups are first-born children, with 52.0% for the control group and 56.5% for the experimental group. For the number of children in the family, the highest proportion in both groups came from families with two to three children, with 40.0% in the control group and 69.6% in the experimental group, reflecting an average family size common among Filipino households. Regarding parents' educational attainment, majority of respondents' parents in both groups had graduated from college, with 48.0% of fathers and 52.0% of mothers in the control group, and 47.8% of fathers and 56.5% of mothers in the experimental group. This indicates that a significant portion of respondents come from families with relatively educated parents, which may have a positive influence on their learning motivation. Lastly, in terms of monthly family income, the largest share in both groups falls within the ₱10,000–₱29,999 bracket with 28.0% in the control and 52.2% in the experimental, suggesting that most respondents belong to lower-middle-income households. Overall, the data reveal that the control and experimental groups are comparable in demographic characteristics, establishing that both groups were relatively homogeneous prior to the intervention, thereby ensuring the validity of subsequent comparisons on vocabulary performance.

Table 1: *Profile of the Students in the Control and Experimental Groups*

Age	Control			Experimental		
	F	%	R	f	%	R
16 and below	3	12.0	2	1	4.3	2
17–18	21	84.0	1	21	91.3	1
19–20	1	4.0	3	1	4.3	3
Total	25	100.0		23	100.0	
Total	25	100.0		23	100.0	
Male	11	44.0	2	15	65.2	1
Female	14	56.0	1	8	34.8	2
Total	25	100.0		23	100.0	
Sibling Position						
First Child	13	52.0	1	13	56.5	1
Second Child	5	20.0	2	5	21.7	2
Third Child	4	16.0	3	2	8.7	4
Fourth and above	3	12.0	4	3	13.0	3
Total	25	100.0		23	100.0	
Number of Children in the Family						
1	6	24.0	3	3	13.0	3
2-3	10	40.0	1	16	69.6	1
4-5	7	28.0	2	4	17.4	2
6 and above	2	8.0	4	-	-	-

Total	25	100.0		23	100.0	
Father's Educational Attainment						
College Graduate	12	48.0	1	11	47.8	1
College Undergraduate	6	24.0	3	6	26.1	2.5
High School Graduate	7	28.0	2	6	26.1	2.5
Total	25	100.0		23	100.0	
Mother's Educational Attainment						
College Graduate	13	52.0	1	13	56.5	1
College Undergraduate	7	28.0	2	3	13.0	3
High School Graduate	5	20.0	3	7	30.4	2
Total	25	100.0		23	100.0	
Monthly Family Income						
Below ₱10,000	2	8.0	4	3	13.0	3.5
₱10,000–₱29,999	7	28.0	2	12	52.2	1
₱30,000–₱49,999	12	48.0	1	3	13.0	3.5
₱50,000 and above	4	16.0	3	5	21.7	2
Total	25	100.0		23	100.0	

3.2. Level of Vocabulary Performance of the Two Groups of Students Before and After Exposure to Gamified Apps as Revealed in the Pretest and Posttest Results

The table shows that the control group obtained a pretest mean score of 15, interpreted as Satisfactory, which increased to 23 in the posttest, indicating a Very Satisfactory level of vocabulary performance. Similarly, the experimental group recorded a pretest mean score of 14, also interpreted as Satisfactory. However, after the intervention, their posttest mean score significantly increased to 28, which falls under the Outstanding category. These results indicate that although both groups improved after the instructional period, the experimental group—exposed to gamified vocabulary applications—demonstrated a more substantial gain in vocabulary proficiency. In terms of score distribution, the highest score in the control group increased slightly from 28 to 29, while the experimental group's highest score improved from 28 to a perfect score of 30. Moreover, the lowest score in the control group rose from 5 to 20, whereas the experimental group's lowest score markedly increased from 6 to 18. This suggests that, beyond improving average performance, the gamified intervention contributed to greater consistency among students in the experimental group, as reflected in the improved lower-end scores and reduced performance gap. These findings support the study of Lozarito and Segumpan (2022), which concluded that digital vocabulary games significantly enhance vocabulary mastery and learner engagement compared to traditional approaches. Their research emphasized that gamification promotes active participation and repeated exposure to vocabulary, thereby strengthening retention and recall.

Table 2: Level of Vocabulary Performance of the Two Groups of Students Before and After Exposure to Gamified Apps as Revealed in the Pretest and Posttest Results

Score	Verbal Interpretation	Control				Experimental			
		Pretest		Posttest		Pretest		Posttest	
		F	%	f	%	f	%	F	%
25 – 30	Outstanding	2	8	6	24	2	9	19	83
19 – 24	Very Satisfactory	5	20	19	76	4	17	3	13
13 – 18	Satisfactory	8	32	-	-	6	26	1	4
7 – 12	Fair	9	36	-	-	10	43	-	-
1 – 6	Poor	1	4	-	-	1	4		--
Total		25	100.0	25	100.0	23	100.0	23	100.0
Mean		15		23		14		28	
Std. Deviation		6.461		2.557		6.787		3.537	
Highest Score		28		30		28		30	
Lowest Score		5		20		6		18	

3.3. Significant Difference on the Level of Vocabulary Performance of the Two Groups of Students Before and After Exposure to Gamified Apps as Revealed in the Pretest and Posttest Results

It can be seen in the table that the t-test for both the control and experimental group arrived at t-values which are less than 0.05, thus the null hypothesis was rejected. Statistically, there is a significant difference in the level vocabulary performance of the students in the control and experimental groups in the pretest and the posttest. This means that the learning gap in the vocabulary performance of the students was addressed in the learning process both for the present strategy and exposure to gamified apps. Results indicate that the use of gamified apps contributed positively to the learners' vocabulary development. The experimental group's improved performance implies that gamified learning provided a more stimulating and effective means of acquiring and retaining new words compared to traditional methods. These findings affirm that incorporating game-based strategies in English instruction can bridge learning gaps and foster sustained vocabulary growth among students. This is in relation with the findings of the study of Samortin (2020), which revealed that the group exposed to gamified learning activities obtained significantly higher posttest scores. Similar to the results presented in Table 4, the findings confirmed that the integration of gamified tools can effectively enhance vocabulary retention, promote active engagement, and increase learners' motivation. This alignment supports the conclusion that gamification is a beneficial approach in developing students' vocabulary proficiency through interactive and enjoyable learning experiences.

Table 3: Significant Difference on the Level of Vocabulary Performance of the Two Groups of Students Before and After Exposure to Gamified Apps as Revealed in the Pretest and Posttest Results

Group	Test	Mean	SD	t-value	p-value	Null Hypothesis	Verbal Interpretation
Control	Pretest	15	6.641	7.472	0.000	Reject Ho	Significant
	Posttest	23	2.557				
Experimental	Pretest	14	6.787	6.986	0.000	Reject Ho	Significant
	Posttest	28	3.537				

3.4. Significant Difference on the Level of Vocabulary Performance of the Experimental and Control Groups as Revealed in the Posttest Results

The table shows that the computed t-value of 5.791 with a p-value of 0.000 indicates a statistically significant difference between the two groups. The null hypothesis was therefore rejected not only at the 5 percent but also at the 1 percent level of significance, signifying that the difference did not occur by chance. Results indicate that the students in the experimental group who were exposed to gamified apps obtained higher mean scores with a mean of 28 and a standard deviation of 3.537 than those in the control group with a mean of 23 and a standard deviation of 2.557. This implies that the use of gamified apps effectively enhanced the students' vocabulary performance. Conclusively, the exposure to gamified learning strategies resulted in better vocabulary acquisition and comprehension outcomes compared to the traditional approach. The findings of this study correlate with the study of Cabanilla (2024), who emphasized that gamified learning promotes active involvement and higher academic accomplishment than traditional education. Incorporating gamified apps gives learners with an engaging platform that can improve their learning outcomes.

Table 4: Significant Difference on the Level of Vocabulary Performance of the Experimental and Control Groups as Revealed in the Posttest Results

Test	Group	N	Mean	SD	t-value	p-value	Null Hypothesis	Verbal Interpretation
Posttest	Control	25	23	2.557	5.791	0.000	Rejected	Significant
	Experimental	23	28	3.537				

3.5. Significant Difference on the Level of Vocabulary Performance of the Experimental Group Exposed to Gamified Apps as Revealed in the Posttest Differ in Terms of Their Profile

Findings revealed that there are no significant differences in the level of vocabulary performance of the experimental group exposed to gamified apps when grouped according to their profile variables. This means that age, sex, sibling position, number of children, father's educational attainment, mother's educational attainment, and monthly family income did not significantly affect the students' vocabulary performance after being exposed to gamified learning apps. The findings of the study imply that the effectiveness of gamified apps in enhancing students' vocabulary performance is consistent across different learner profiles. This means that factors such as age, sex, or family background did not influence how students benefited from the use of gamified learning tools. Thus, gamification appears to be an inclusive instructional approach that provides equal learning opportunities and positive outcomes for diverse groups of students regardless of their demographic or socioeconomic differences. This result is supported by Duterte (2024), who emphasized that well-designed gamified activities foster participation and enjoyment in learning, showing that gamification can transcend individual differences. Similarly, the present findings confirm that gamified vocabulary apps effectively enhance learning outcomes irrespective of learners' demographic profiles, making them a valuable and equitable educational strategy in language instruction.

Table 5: Significant Difference on the Level of Vocabulary Performance of the Experimental Group Exposed to Gamified Apps as Revealed in the Posttest Differ in Terms of Their Profile

Profile	F-value	p-value	Null Hypothesis	Verbal Interpretation
Age	0.184	0.833	Accepted	Not Significant
Sex	0.406	0.531	Accepted	Not Significant
Sibling Position	0.659	0.587	Accepted	Not Significant
Number of Children	0.810	0.459	Accepted	Not Significant
Father's Educational Attainment	0.489	0.621	Accepted	Not Significant
Mother's Educational Attainment	0.332	0.802	Accepted	Not Significant
Monthly Family Income	0.560	0.648	Accepted	Not Significant

4. Conclusion & Recommendations

The study concludes that gamified applications such as Anki and Quizlet are effective in enhancing students' vocabulary development, retention, and engagement. Compared to traditional instruction, gamified learning promotes more active participation and efficient vocabulary acquisition. Furthermore, the effectiveness of these tools was found to be consistent regardless of students' demographic profiles.

Based on these findings, it is recommended that school administrators support technology-enhanced learning through training and resource provision. Teachers are encouraged to integrate gamified apps into vocabulary instruction, while students may use them as supplementary learning tools. The inclusion of gamified activities in the English curriculum is also suggested. Future research may explore the long-term effects of gamification and its impact on other language skills such as reading, writing, and speaking.

Compliance with ethical standards

The authors declare no conflict of interest. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. This study was self-funded. The authors thank the participating university and the nursing students for their contributions.

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