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EXPLORING VOCABULARY RETENTION AND STUDENT ENGAGEMENT: A DIVE INTO GAMIFIED VS. TRADITIONAL FLIPPED CLASSROOM

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Abstract: This study compares the Gamified Flipped Classroom (GFC) model to the Traditional Flipped Classroom (TFC) model on vocabulary retention and student engagement in 76 students. This study examined if the two teaching approaches differed in vocabulary and student engagement. Both groups' vocabulary retention increased after the intervention, with the experimental group scoring 78.45 compared to 76.89 for the control group. Independent sample t-tests showed statistically significant improvements in both groups' post-test scores ($p < 0.001$), but no significant difference was found between them, leading to the rejection of Hypothesis 1. GFC had

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better mean Likert-scale values for student involvement (4.32) than TFC (3.76). The Mann-Whitney U test demonstrated substantial engagement differences between groups. Although the GFC model had certain drawbacks, qualitative data from the open-ended survey and focus group talks showed numerous positive student opinions. GFC increases student involvement, but both teaching approaches improve vocabulary retention, according to study.

Keywords: *Flipped classroom, engagement, gamification, gamified flipped classroom, vocabulary retention*

INTRODUCTION

Integrating innovative pedagogical approaches in second language acquisition (SLA) has garnered considerable attention in contemporary educational discourse (Kaur et al., 2023). The Gamified Flipped Classroom (GFC) model presents a compelling framework for enhancing learner engagement, intrinsic motivation, and overall academic performance outcomes (Govindarajan, 2021). The GFC approach changes traditional class structures by optimizing class time (Samadi et al., 2024). It leverages technology to reverse the roles of typical classroom and homework activities. The GFC model synergistically merges the flipped classroom principles with gamification techniques, creating an interactive learning environment that promotes active participation and fosters deeper cognitive processing. The strategically designed GFC model can bridge students' learning preparation more freely by utilizing class meetings to apply skills collaboratively.

In recent years, the integration of games within the flipped classroom model (FCM) has emerged as an innovative and engaging approach to enhance language learning, particularly in acquiring new vocabulary (Yu, 2023). As the demand for English language proficiency grows among non-native speakers, educators are increasingly challenged to implement effective strategies that cater to diverse learning needs and promote vocabulary retention. This study represents one of the pioneering efforts to

explore the impact of game-based learning in a flipped classroom setting, specifically designed to assist individuals who are not fluent in English as they seek to expand their lexical repertoire. The ultimate aim of this research is to advance the field of language instruction significantly and offer valuable insights into improving vocabulary learning methodologies in educational contexts.

Research indicates that certain factors, such as the media used by the instructor, can impact the effectiveness of second language (L2) vocabulary learning. A study was conducted by Bancha and Tongtep (2021) with 72 university students in Thailand to evaluate whether using Learning Management Systems (LMS) and games enhances vocabulary retention, and to determine which method is more effective. The results indicated that both techniques can efficiently improve vocabulary memorization and retention, with no notable difference between them. Zhang and Zou (2022) analyzed 41 research articles to investigate the effectiveness of different tools used in the vocabulary learning process. Their findings highlighted the potential use of technology to enhance learning activities and attention. Furthermore, Pikhart et al. (2023) compared printed and digital media in teaching vocabulary. They mentioned that digital media can enhance students' short-term vocabulary retention. Recent studies (Fahandezh & Mohammadi, 2021; Pratiwi et al., 2024; Sadeghi et al., 2022) focused on implementing games to teach and learn vocabulary. The findings proved that this kind of media significantly improves vocabulary retention.

Game-based learning has emerged as a potent educational strategy that leverages game design principles to enhance engagement, motivation, and learning. In language education, gamified activities offer interactive and immersive experiences that resonate with learners' intrinsic motivation, fostering an environment conducive to vocabulary acquisition (Hamari et al., 2014). These gamified learning environments, featuring rewards, progress monitoring, and competitive elements, stimulate active involvement and facilitate heightened student engagement with vocabulary learning resources.

According to the literature, using the GFC can improve students' vocabulary mastery and provide an independent learning experience. However, while some studies have demonstrated positive outcomes, inconsistent findings lead to research gaps. Some studies have reported significant improvements in vocabulary acquisition and retention with GFC (Alnuhayt, 2018; Knežević et al., 2020; Nhac, 2022). Others have found no significant improvement and even lower mastery compared to conventional classes (e.g., Fraga & Harmon, 2014; Mori et al., 2016) and even lower mastery compared to students in conventional classes (Jalili et al., 2020). Although existing research supports the effectiveness of FCM in improving vocabulary proficiency, there is a need to explore how gamification can be integrated into the flipped-classroom environment to enhance vocabulary acquisition for non-English majors. The inconsistent findings regarding the effectiveness of GFC raise questions about the optimal teaching strategies within this framework. Consequently, it is necessary to conduct an in-depth investigation of implementing the GFC model on non-English students and its impact on their vocabulary acquisition. By tackling these research deficiencies, this study adds to the current understanding of technology-infused language learning and aids in improving best practices for integrating GFC in various educational environments. The results may provide actionable suggestions for enhancing vocabulary teaching in English for General Purposes (EGP) classes, ensuring the GFC model is well-constructed to optimize student learning results.

The present study aims to comprehensively analyze the benefits and impact of GFC for vocabulary retention among non-English department students. By integrating insights from recent theories and studies in gamification, flipped classrooms, and vocabulary acquisition, this study provides a detailed understanding of the effectiveness of the gamified learning approach in language education. In addition, the study seeks to uncover diverse insights into student engagement, motivations, and learning outcomes in gamified learning, offering valuable implications for teaching practice and future research in English Language Teaching.

The research focuses on several specific questions regarding the impact of the GFC model. First, it examines how implementing the GFC model affects the vocabulary retention of non-English department students compared to the TFC approach. Additionally, the study investigates how the GFC model influences the engagement and motivation of these students in retaining vocabulary. Finally, it seeks to understand how students perceive the implementation of the GFC model in their learning experience.

METHOD

Research Design

The researchers used a sequential exploratory mixed method to address the research questions. This method involved using both quantitative and qualitative methods. The research started with quantitative data collection and analysis, which provided numerical data that could be statistically analyzed. Then, the researchers moved on to qualitative data collection and analysis, which involved gathering non-numerical data and interpreting it to understand the underlying reasons and motivations. According to Shorten and Smith (2017), using mixed methods in research provides a comprehensive understanding of the research topic by examining phenomena from different perspectives.

The main focus of the study was on the quantitative method, which was used to measure the effect of implementing a gamified flipped classroom (GFC) model on vocabulary retention. A comparison was made with the traditional method class that did not utilize a gamification approach. The research employed an experimental design featuring both a pre-test and a post-test, which also included a control group. Participants in the experimental group engaged in learning using GFC, while the control group used the lecturing method. Both groups took a pre-test at the beginning of the session and a post-test at the end. Additionally, Qualitative approaches were used to understand the learning experiences of students solely in the experimental class.

The research activities can be seen in Figure 1.



Figure 1. Research Design

Subject

The subjects involved in this research comprised 76 first-year undergraduate students from non-English departments at a public university in Bengkulu Province, Indonesia. These students were enrolled in two classes as part of their general education requirements. The initial step in the selection process involved identifying students who had signed up for the compulsory General English course, which is a required class for all non-English department students. From the group of registered students, two intact classes were selected based on the availability of courses and scheduling limitations set by the university. No additional criteria, such as proficiency level or previous English learning background, were considered, ensuring that the participants reflected a typical group of first-year non-English departments.

Group Assignment

Based on their class schedules, the students were divided into two groups of 38. The experimental group (n=38) received instruction using the GFC model, while the control group (n=38) was taught through the traditional flipped classroom (TFC) model. Since the study was quasi-experimental, the group assignments were not randomized. Instead, they were aligned with the students' existing course schedules to avoid disrupting their academic activities.

Instruments

The researchers adopted a thorough method for data gathering by using three different tools: a standardized vocabulary assessment meant to evaluate particular variables, an extensive questionnaire focused on collecting personal information from participants regarding their engagement in the classroom process, and a focused group discussion that facilitated in-depth dialogue and insights among a chosen group of individuals. The researchers carefully selected each instrument to complement the others, ensuring a robust and detailed understanding of the research topic.

Vocabulary Mastery Test

A standardized vocabulary test was developed based on the Vocabulary Levels Test (VLT) by Nation and Beglar (2007) to measure vocabulary mastery. The test was modified to fit non-English department students' proficiency levels and academic needs. It contained 50 multiple-choice questions assessing knowledge of high-frequency words (common in general English usage) and academic words (frequently encountered in academic texts and discussions). Each question provided a target word with four possible meanings or definitions, and students had to choose the correct one. To ensure the validity and reliability of the test, the researchers conducted a try-out test for another class outside the sample.

The assessment was structured in two distinct phases to comprehensively evaluate the students' vocabulary knowledge. The first phase involved a pre-test that was administered one week before the start of the intervention. This pre-test was designed to gauge each student's vocabulary understanding, establishing a clear baseline for their initial knowledge levels. A post-test was given after completing the six-week intervention, which focused on enhancing vocabulary through targeted activities and instruction. The purpose of the post-test was to measure the students' growth and improvements in vocabulary mastery due to the intervention. By comparing the pre-test

and post-test results, the researchers aimed to identify the effectiveness of the instructional strategies employed during the intervention.

Student Engagement Survey

Student engagement was assessed using the Student Engagement Scale (SES), which was carefully developed by Gunuc and Kuzu (2015) to capture various dimensions of learner engagement. The questionnaire consisted of several items designed to evaluate three core aspects of student engagement: behavioral, emotional, and cognitive engagement. Participants were instructed to rate each statement on a five-point Likert scale, where “1” represented "strongly disagree" and “5” indicated "strongly agree." This structured approach allowed for a comprehensive analysis of student engagement across multiple dimensions, providing valuable insights into their overall involvement in the educational process.

The instrument was validated using two key statistical analyses: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Its reliability was assessed using Cronbach's alpha, which showed high internal consistency. Specifically, the EFA yielded a Cronbach's alpha of 0.957, while the CFA produced a slightly lower yet impressive alpha of 0.929. These high values indicate that the items within the SES work well together to measure student engagement reliably. As a result, the researcher decided to use the entire instrument for the study, confident in its robustness and validity in capturing the nuances of student engagement.

Focused-Group Discussion

A focused group discussion was organized with students who had experienced this teaching method firsthand to gather insights into students' perspectives regarding implementing the GFC instructional model. Participants were encouraged to share their thoughts and feelings about the GFC approach during the discussion. Several key questions were addressed to facilitate the discussion: 1) "How do you feel after following the learning design based on the GFC model?"; 2) "What elements of the learning process do you find satisfying or

unsatisfying?"; 3) What are the specific reasons why you like or dislike the GFC model?". All questions were asked to gain in-depth insight from students so that a clear picture could be obtained regarding their perceptions of the following learning using GFC.

Procedure

Before starting the experimental procedure, all control and experimental group participants received a thorough overview of the purpose of the study and step-by-step instructions for the learning activity they were about to undertake. Each group was provided with the same educational materials that strictly followed the English MKU syllabus from the University.

The experimental class group was taught using Quizizz, a free game-based learning application. This platform allows students to access materials and work on interactive exercises on designed vocabulary games. Meanwhile, the control class group accessed learning materials through Google Classroom, a learning platform provided for free by Google. This platform allows students to download teaching materials and collect vocabulary exercises online. Different teaching media are intended to control and evaluate flipped classroom learning activities based on gamification and conventional.

Analysis of Data

Quantitative data analysis in this study was measured using descriptive and inferential statistics calculated by SPSS software version 23. Descriptive analysis was performed initially to produce a comprehensive understanding of the data in general, then continued with a more complex inferential analysis to evaluate the proposed hypothesis.

For the inferential analysis, an independent samples t-test was chosen as the statistical method to assess the differences in outcomes between pre-tests and post-tests for each group. Additionally, a paired-sample t-test was utilized to compare the two educational environments: the Gamified Flipped Classroom (GFC) group and the

traditional Flipped Classroom (TFC) group. This t-test was essential for comparing students' post-test scores, enabling an assessment of whether any observed differences in performance were statistically significant. By employing these rigorous statistical methods, the study intends to yield insights into the effectiveness of gamified and traditional flipped classroom models in enhancing both vocabulary mastery and student engagement. Two hypotheses under investigation were framed as follows: Hypothesis 1: "There is a statistically significant difference in vocabulary mastery between students in the GFC and TFC groups." Hypothesis 2: "There is a statistically significant difference in class engagement between students in the GFC and TFC groups."

Qualitative insights derived from the focus group discussion sessions were analyzed thematically based on the steps proposed by Naeem et al. (2023). This analysis consists of six steps: transcription, keyword selection, coding, developing a theme, interpretation, and developing a concept. This thematic analysis enriched the understanding of the student-participants' experiences and perceptions regarding the teaching methodologies applied in the study. To enhance the validity and reliability of the qualitative data, methodological triangulation was utilized by juxtaposing the outcomes of the focus group discussions with classroom observations. Furthermore, intercoder reliability was created by engaging several researchers in the coding process and addressing any differences through discussion. Member checking was also performed, enabling participants to assess and verify the accuracy of the interpreted data, further strengthening the credibility and trustworthiness of the results.

FINDINGS

The results are presented in alignment with the specific research questions explored throughout the investigation.

RQ1: Is There Any Significant Difference in Students' Vocabulary Retention between the Experimental (GFC) and Control (TFC) Groups?

The study involved 76 students: 38 in the experimental group (Gamified Flipped Classroom) and 38 in the control group (Traditional Flipped Classroom). Table 1 presents each group's pre-test and post-test mean scores and the standard deviations, minimum, and maximum scores.

Table 1.
Descriptive Statistics

Group	Test	N	Mean	Standard Deviation	Minimum	Maximum
Experimental (GFC)	Pre-	38	66.50	4.89	60	78
	Post-	38	78.45	6.12	65	90
Control (TFC)	Pre-	38	65.42	4.82	60	76
	Post-	38	76.89	5.98	63	88

The pre-test scores show that both groups started with similar levels of vocabulary knowledge, as evidenced by the comparable mean scores (66.50 for the experimental group and 65.42 for the control group). After the intervention, both groups demonstrated improved vocabulary retention, with the experimental group achieving a higher mean post-test score (78.45) than the control group (76.89). The ranges of scores also indicate consistent performance across students within each group.

Independent sample t-tests were conducted for pre-test and post-test scores to analyze improvements within each class. The results are displayed in Table 2.

Table 2.
Independent sample t-test result

Group	Test	Mean	Std Dev	t-value	df	p-value	Effect Size (Cohen's d)
Experimental (GFC)	Pre-	66.50	4.89				
	Post-	78.45	6.12	9.210	74	<0.001	1.32
Control (TFC)	Pre-	65.42	4.82				
	Post-	76.89	5.98	8.162	74	<0.001	1.18

Furthermore, Paired sample t-tests were conducted to compare the mean differences between the experimental and control groups. The results are displayed in Table 3.

Table 3.
Paired-sample t-test

Comparison	Mean Difference	t-value	df	p-value	95% CI for Mean Difference
Experimental (GFC)	11.95	9.210	37	<0.001	[9.25, 14.65]
Control (TFC)	11.47	8.162	37	<0.001	[8.72, 14.22]

The results indicate statistically significant improvements in vocabulary retention scores for both groups, with the experimental group showing slightly higher mean differences. These findings rejected Hypothesis 1, which means there is no statistically significant difference in vocabulary mastery between GFC and TFC group students.

RQ2: Is there any significant difference in student engagement between the experimental (GFC) and control (TFC) groups?

Data on student engagement were collected through a Likert-scale questionnaire. The results indicated that the experimental group rated their engagement higher than the control group. Table 4 provides the mean and standard deviation for these measures.

Table 4.
Measurement of student engagement in both groups

Dimension	Group	Mean	Standard Deviation
Engagement	Experimental (GFC)	4.32	0.52
	Control (TFC)	3.76	0.61

A Mann-Whitney U test was conducted for these non-parametric data, revealing statistically significant differences in both engagement ($p < 0.05$) and motivation ($p < 0.05$) favoring the experimental group. This result accepts Hypothesis 2, where student engagement in the GFC class increased significantly when compared to the TFC class.

RQ3: How Do Students Perceive the Implementation of GFC?

This research question was answered using open-ended questions and focus group discussions. They were employed to explore students' insights into implementing the GFC model in learning. The results show residual involvement in learning while accepting challenges. The thematic analysis resulted in several essential themes from students' perceptions: interactive learning, increased accountability, and challenges while operating technology.

Interactive Learning Experience

Students appreciate gamification elements in learning that make them feel directly involved in the learning process and can see their progress directly. This makes students feel more comfortable and enjoy the learning process. The following excerpt confirms this condition.

> "This class [GFC], in my opinion, is not like the classes that usually happen during my studies as a student. My lecturer spends more time designing the learning to make it easier for us, and we enjoy learning English. I appreciate it" *(st3)*

An additional excerpt from St1 emphasizes the significant effectiveness of gamified learning environments (GFC) in fostering an engaging and interactive learning experience. This observation accentuates how such immersive educational settings can profoundly boost students' confidence, encouraging them to participate more actively in classroom discussions and collaborative activities.

> "I often feel insecure when I have to answer questions given by lecturers in class, but using this platform [quizziz] makes me more courageous to engage in discussions. And it feels fun" *(st1)*

Increased Accountability

Participants highlighted that the game-like challenges inherent in the GFC model instilled a sense of accountability among them. The

structured nature of the tasks encouraged them to prepare consistently and engage in regular participation, as they became aware that their contributions were not only necessary for their success but also for the success of the study overall. The following excerpt supports this.

> "By getting the materials and practice assignments earlier than the lecture schedule, we have the opportunity to prepare and prioritize learning in order to get maximum results" (st3)

The additional excerpt further strengthens the argument for the GFC by highlighting its role in enhancing accountability within the learning process. This accessibility not only empowers students to take control of their education but also encourages them to engage more actively with the available resources, leading to a deeper understanding of the subject matter and a greater sense of responsibility for their learning journey. To illustrate this point, St4 notes the following:

> "The use of technology-based media allows us to access learning materials anytime and anywhere freely"(st4)

Technological challenges

Although students generally view implementing the GFC model in learning as positive, they admit that several challenges are faced during the learning process. These are related to the technical aspects and familiarity with the platform used to distribute the materials.

The primary challenge students encounter when using GFC is related to the reliability of their internet connections. Many students have reported difficulties such as slow speeds and intermittent service, which can hinder their ability to engage with the platform effectively. The following quotes from St2 illustrate these concerns and highlight how connectivity issues can disrupt their learning experience and overall interaction with GFC.

> "Because I live in a rural area, poor internet connections often make it difficult to access teaching materials and do assignments that the lecturer has uploaded. This makes me sometimes unable to complete assignments according to the specified deadline" (st2)

The other thing that hindered students from using GFC was their level of familiarity with the application itself. Many students may struggle to navigate its features, which could lead to frustration and decreased engagement. St4 pointed out this issue during discussions, highlighting how a lack of experience can hinder the effective utilization of the tool.

> "At the beginning of this learning, I found it difficult because I was unfamiliar with the quizziz application and had never used it before. This was quite frustrating. But finally, my lecturer taught me again, and it made me more comfortable" (st4)

Another barrier identified was related to the availability of devices among the students. Not every student possesses a laptop or desktop computer, which limits their ability to access the applications required for their coursework effectively. When students are forced to rely on their mobile phones instead, the experience becomes inefficient and cumbersome. This issue was highlighted by St5, who expressed frustration with navigating the application on a smaller screen, which often leads to difficulty in completing tasks efficiently.

> "I do not have a laptop. Meanwhile, if I use a cellphone when I have to upload my work to the platform, it is difficult. So, I often lend my friend's device to do that" (st5)

In summary, incorporating gamification elements into flipped classrooms can significantly enhance student engagement and motivation in the learning process. Integrating game-like features can create a more dynamic and enjoyable learning environment. This approach fosters a sense of competition and achievement among

students and encourages active participation and collaboration. However, it is important to consider that technical constraints often accompany the implementation of these technological tools. Issues such as internet connection, access to devices, and varying levels of digital literacy among students may hinder the effectiveness of gamification in these settings. Addressing these challenges is crucial to ensure that the benefits of gamified learning can be fully realized without causing frustration or disengagement among learners.

DISCUSSION

The primary findings of this study reveal significant improvements in vocabulary retention scores for both the experimental (Gamified Flipped Classroom, GFC) and control (Traditional Flipped Classroom, TFC) groups. Statistical data calculation resulted in only a slight difference in the average between the control and experimental classes. The control class obtained an average of 11.47 with an effect size of 1.32, while the experimental class obtained an average of 11.45 with an effect size of 1.18. These figures prove that both learning models can influence students' vocabulary retention.

The potential of the GFC model to evoke a sense of inspiration and motivation in the audience is highlighted in the present study. The comparative effectiveness of the GFC model is consistent with contemporary research highlighting the advantages of gamification and active learning methodologies in language acquisition. Several studies (Agustini et al., 2023; Fadhli et al., 2020; Mekler et al., 2017) have illustrated that gamified learning environments significantly enhance student motivation and retention by incorporating elements of engagement and interactivity and facilitating collaborative knowledge activities. In addition, Jun and Lucas (2024) reviewed many research articles published in journals from 2021 to 2024 to see the impact of gamification in education. The study concluded that gamification can increase student engagement in completing tasks and encourage sustainable learning outcomes, particularly in language education. These findings are consistent with the

current study, which reveals that the gamified approach produces slightly better results than the traditional flipped classroom model.

The lack of a statistically significant difference between the GFC and TFC groups starkly contrasts with recent literature suggesting that gamification can significantly affect learning outcomes. For example, Zainal (2023) reported a more significant increase in vocabulary retention after implementing a learning intervention with gamification in experimental classes than in classes without a gamification intervention. Similarly, Arsyad et al. (2024) underlined that using the flipped classroom model can encourage student engagement in class. At the same time, the integration of gamification elements can increase student work metrics. This incongruence may be attributed to contextual variables, such as the limited duration of the intervention and variability in students' prior exposure to gamified learning elements.

The comparable effectiveness observed between the gamified flipped classroom (GFC) and traditional flipped classroom (TFC) groups in this study may indicate the robust foundational strengths of the flipped classroom model itself, regardless of the gamification element. A study conducted by Vitta and Al-Hoorie (2023) supports this notion, in which they found that flipped classrooms can significantly enhance learning outcomes. This enhancement occurs because the model facilitates the reallocation of passive learning activities. Consequently, this shift allows for a more engaging classroom environment where students can participate in interactive and collaborative learning experiences during class (Chen et al., 2023)Therefore, the significant improvements found in both groups, GFC and TFC, are likely related to the intrinsic benefits of the flipped classroom model framework, which prioritizes student engagement and fosters a deeper understanding of active learning.

The findings of this current study prove that there is a significant difference in the level of student engagement. The statistical results of the comparison of the two classes show an average of 3.76 for the control class and 4.32 for the experimental class, with standard deviations of 0.61 and 0.52, respectively. These significant results echo the results of previous research by Li et al. (2025), which highlighted the positive impact of gamification on students' learning engagement

experiences. Similarly, Putri et al. (2025) found that more than 85% of student participants felt engaged and motivated in the classroom environment, which integrated gamification in a flipped classroom. It means gamification attracts students to be more motivated and involved in the learning process with interactive and fun learning activities, so it will directly or indirectly affect their learning outcomes.

Implementing the GFC model has notably transformed the classroom experience by significantly enhancing student engagement by incorporating gamification techniques. These techniques have created a more interactive and enjoyable learning environment, effectively capturing students' attention and interest. As a result, many students have reported a marked increase in their willingness to participate in class activities. The gamified elements of the coursework have not only reduced feelings of anxiety that often accompany traditional learning but have also cultivated a more positive and encouraging attitude toward active involvement in the classroom setting. This finding is remarkably consistent with the recent systematic review of Majid et al. (2024) which highlighted that gamification in flipped classroom models can significantly boost students' active engagement and intrinsic motivation. This is especially pertinent in contexts focused on language learning, where maintaining student enthusiasm can be challenging.

Recent studies have made significant strides in understanding the nuances of gamification, particularly its impact on fostering self-confidence among students. This dimension has not been thoroughly examined in earlier research. This exploration reveals that students engaging in gamified learning experiences tend to display heightened levels of engagement and an increased sense of personal efficacy. Such engagement is crucial, as it fosters a deeper connection to the learning material and can result in enhanced educational outcomes, including better information retention and improved assessment performance. These insights corroborate the study conducted by Wei and Luo (2025), which illustrated that students who participated in an online learning environment enriched with gamified components exhibited higher self-confidence levels than their peers engaged in traditional, offline

educational settings. This correlation presents compelling evidence for educators and researchers alike to investigate the dynamics of gamification in education, suggesting promising avenues for future research that could further illuminate its benefits and applications in various learning contexts.

The GFC has significantly fostered a sense of accountability among students, who have expressed a strong appreciation for the structured and goal-oriented framework of the activities provided. Many participants observed that the clear and specific objectives at the beginning of each session and the activities' collaborative elements created an environment where everyone felt encouraged to prepare thoroughly and engage actively in discussions and projects. This finding aligns well with the research conducted by Samadi et al. (2024), emphasizing how flipped classrooms can effectively promote self-regulation, critical thinking, and foster accountability among learners (Nachatar Singh et al., 2019). The GFC approach, however, differentiates itself by integrating gamified challenges, which add a unique and engaging dimension to the learning experience. This integration maintains the structured framework that students find beneficial and infuses an element of intrinsic motivation. The gamified challenges encourage students to invest more in the learning process as they seek to achieve personal and group objectives while enjoying the competitive and playful elements of the tasks.

The GFC has significantly enhanced students' sense of accountability, leading to a strong appreciation for the structured and goal-oriented framework of the activities offered. Many participants noted that the clear and specific objectives outlined at the beginning of each session and the activities' collaborative elements fostered an environment where everyone felt encouraged to prepare thoroughly and engage actively in discussions and projects. This observation aligns with research conducted by Samadi et al. (2024) and Nachatar Singh et al. (2019), which emphasizes how flipped classrooms can effectively promote self-regulation, critical thinking, and accountability among learners. However, the GFC approach stands out by incorporating gamified challenges, adding a unique and engaging

dimension to the learning experience. This integration preserves the structured framework that students find beneficial while infusing an element of intrinsic motivation. The gamified challenges encourage students to invest more in the learning process as they strive to achieve personal and group objectives while enjoying the competitive and playful aspects of the tasks.

Among the benefits of implementing GFC, students perceived some challenges. It is important to consider the insights provided by M. Li et al. (2023), who argue that the effectiveness of gamification in enhancing student engagement is not a one-size-fits-all solution but depends on several contextual factors. Specifically, they highlight that the impact of gamification is influenced by students' initial levels of digital literacy and their familiarity with various gamified learning tools and platforms. The qualitative data from the current study corroborate this argument by shedding light on several technological challenges and accessibility issues that students frequently encounter.

This study found some barriers to technological use. A few students are not ready to participate in learning activities through digital media, as confirmed by a study conducted by Mexhuani (2025)He reported that even though online platforms can benefit personalized student learning, they come with challenges, such as the digital divide among the learners. These obstacles may serve as moderating factors that dilute the potential benefits of gamification. As a result, this dynamic may help to explain the moderate effect size observed concerning gamification within this particular educational context. By understanding these nuances, educators can better tailor gamified approaches to meet the diverse needs of their students, ultimately enhancing the overall learning experience.

CONCLUSION

This research shows that both the Gamified Flipped Classroom (GFC) and the Traditional Flipped Classroom (TFC) improved vocabulary retention. However, the GFC model boosted student engagement more effectively through higher engagement scores and positive feedback. The study emphasizes that gamification can make

learning English more enjoyable and interactive, especially for remembering vocabulary.

The authors are aware of the limitations of this study. First, the number of samples used was only 76 students, which means that the generalization of the results of this study is limited. Therefore, further research is hoped to be conducted with a more significant and diverse number of students to validate the results. Second, this study only focused on vocabulary retention and engagement without considering the long-term academic achievements. Therefore, it is hoped that further research can specifically consider measuring the long-term effects on academic ability or English language skills. In addition, this study used self-reporting to determine student engagement in the learning process. This has the potential to cause bias and subjectivity in data collection. Therefore, further research can use objective instruments to avoid them.

The finding of a positive influence of the use of the GFC model on vocabulary retention during the learning process underlines the consistency of the theory related to the effectiveness of using the model in learning English as a second language or a foreign language. Therefore, it is recommended that lecturers or teachers adapt gamification elements in English learning, especially for non-English major students, so that students are more motivated and produce more optimal learning outcomes. However, it should be understood that applying the GFC model cannot completely replace traditional teaching techniques, where lecturers explain the material and provide examples in class. The GFC model can be adapted as an alternative to complement the conventional learning process. In the future, significant benefits can be obtained if lecturers can balance and align traditional and technology-based learning pedagogical approaches.

DECLARATION OF AI AND AI-ASSISTED TECHNOLOGIES

This manuscript has undergone a thorough review for clarity and readability by applying AI-assisted technology, specifically ChatGPT. The

role of the AI was confined to refining the language, enhancing coherence, and improving overall readability. It is important to emphasize that the foundational ideas, research design, analysis, and conclusions articulated in this work are solely the product of the author's original efforts. The use of AI was limited strictly to language enhancement and did not impact the conceptual or methodological integrity of the study.

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