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ISSUES

EFFECTS of GAMIFIED GRAMMAR and VOCABULARY LEARNING in an ENGLISH COURSE on EFL STUDENTS in THAILAND

Nur Lailatur Rofiah[1], Budi Waluyo[1]

[1] School of Languages and General Education, Walailak University

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The present study investigated the effects of gamified grammar and vocabulary learning using Kahoot!, Quizizz, and Quizlet on learning performance, motivation, enjoyment, anxiety, and classroom dynamics and engagement in an English course. The investigation also involved the effects of gamified learning on gender, proficiency, and learning outcomes. Gamified learning was implemented for eight weeks, consisting of Cycle 1 (grammar) and Cycle 2 (vocabulary). Data were collected using survey questionnaires, grammar and vocabulary tests, and English proficiency tests. The results indicated high positive effects on the five survey constructs and significant increases were noted for learning motivation and classroom dynamics and engagement while reducing learning anxiety. The effects remained constant for female and male students, yet high-level students would likely enjoy and be engaged more in gamified learning than low-level students. Despite these highly perceived effects, they were not significant predictors of students' grammar learning outcomes. Only the degrees of students' learning enjoyment and anxiety can help estimate students' achievement in vocabulary learning.

1. Introduction

Over the past decade, the field of English Language Teaching (ELT) has been increasingly enriched by the integration of gamified learning, with numerous studies corroborating its beneficial impact on student engagement and academic achievement. Dehghanzadeh et al. (2019) conducted a comprehensive review spanning publications from 2008 to 2019 on gamification in ELT, uncovering a predominant trend of positive outcomes associated with gamified learning, including enhanced enjoyment, engagement, motivation, and fun within educational settings. This sentiment is echoed across various research efforts (Mazhar, 2019; Millis et al., 2017; Noroozi et al., 2016; Pratiwi & Waluyo, 2022), which collectively affirm the efficacy of gamification not only in traditional classroom environments but also within blended learning frameworks. Le (2020) demonstrated the profound impact of gamified learning on student engagement in a Vietnamese ESL blended course over a 12-week study, noting significant behavioral, emotional, and cognitive involvement. Similarly, research by

Waluyo and Bucol (2021) in Thailand highlighted the success of gamified learning in enhancing vocabulary acquisition among students with lower proficiency levels.

The use of gamification applications, especially online quizzes such as Kahoot, Quizizz, and Quizlet, has been extensively explored in various ELT contexts, including EFL reading, grammar, and vocabulary (Chiang, 2020; Ulla et al., 2020; Waluyo & Bucol, 2021; Yunus et al., 2021). Despite the acknowledged positive effects, Dehghanzadeh et al. (2019) pointed out a gap in the literature regarding the sustained impact of gamification across multiple English skills or lessons over time. Addressing this void, the current study conducts an eight-week investigation employing Kahoot, Quizizz, and Quizlet in both grammar and vocabulary instruction to examine shifts in EFL students' learning outcomes, enjoyment, anxiety, and engagement at a Thai university, with a focus on both individual and group learning dynamics to gauge the comprehensive effectiveness of gamified learning strategies. The following research questions are addressed:

1. How do students perceive the effects of gamified grammar and vocabulary learning on their learning performance, motivation, enjoyment, anxiety, and classroom dynamics and engagement?
2. What are the effects of gamified grammar and vocabulary learning on male and female students?
3. How does gamified grammar and vocabulary learning affect students with varying levels of English proficiency?
4. What impact does gamified grammar and vocabulary learning have on learning outcomes?

2. Literature review

2.1. Gamification

Gamification has become popular in educational research and teaching practice in the last decade (Amer, 2021; Panmei & Waluyo, 2022). Nick Pelling created the term "gamification" in 2002 to refer to the techniques, mechanics, and applications used to organize activities to encourage and engage people in a non-game context to solve issues and/or accomplish specific pre-planned goals (Apridayani, 2022; Crompton & Traxler, 2015). Practically, any teaching and learning process that utilizes gamification contains online applications, called gamified learning, which provide game-like elements, encompassing reward systems, e.g., badges and prizes, points, leaderboards, and so forth (Seaborn & Fels, 2015). After reviewing in 2017 the findings of empirical studies published in the databases of ACM Digital Library, ERIC, IEEE Xplore, JSTOR, PubMed, ScienceDirect, and SpringerLink, it was observed that the effects of gamified learning have

been significantly positive on enhancing cognitive, motivation, and behavioral learning outcomes (Apridayani & Waluyo, 2022; Sailer & Homner, 2019). The inclusion of gamification in learning instruction enables teachers to implement game fiction and combine individual and group competitions.

In the ELT context, gamification has been applied to various English lessons and skills with different levels of EFL students. A recent study by Bueno-Alastuey and Nemeth (2020), for instance, integrated Quizlet into an English vocabulary class involving advanced-level students, and Waluyo and Bucol (2021) implemented the app for teaching vocabulary for low-proficiency students. In another study, Hashim et al. (2019) gamified grammar learning among Malaysian EFL students using Socrative, PowerPoint Challenge Game, and Kahoot!. The pedagogical implementation of gamified learning has also been observed in teaching writing using Storium (Mazhar, 2019) and teaching English pronunciation using TipTopTalk! (Tejedor-García et al., 2016).

However, most of the previous studies examining the effects of gamified English learning focus on one specific lesson or skill, as mentioned earlier. Little is known about how gamified learning affects students' learning performance, motivation, enjoyment, anxiety, engagement and outcomes when it is implemented in multiple English learning lessons or skills; in this instance, whether gamified learning is more or less impactful is still unclear. One English course at a university level usually contains learning materials covering more than one lesson or skill, e.g., vocabulary, grammar, listening, writing, and speaking. Research examining the gamified learning effects implemented in the study of more than one skill will shed light on how English lecturers should adjust their course instructions to maximize the benefits of gamified learning for students' English learning. The present study attempts to address such a knowledge gap by implementing gamified grammar and vocabulary learning at a university in Thailand.

English teachers have favorable attitudes towards the use of technology in class (Nueva, 2019; Waluyo & Apridayani, 2021). Ulla et al. (2020) investigated teacher practices in using internet-based applications in their English teaching classes at a university in Thailand. The investigation identified eight applications that were frequently utilized in their classroom teaching: Kahoot, Socrative, Google Forms, QR code, Facebook, YouTube, Quizizz and Quizlet. Each application was used to achieve different learning purposes, yet all the participants reported that internet-based applications could make their English courses more convenient, exciting, and fluid. Among these mentioned applications are gamification tools that can facilitate online quizzes, including Kahoot, Quizizz, and Quizlet. The use of these three apps in English learning has opened the path to the integration of mobile learning into an EFL setting, which is also supported by the fact that all university students own smartphones and use them daily. An empirical

study employing pre- and post-ICT usage questionnaires and semi-structured interviews at a university in Japan discovered that students had positive attitudes towards ICT and m-learning due to the flexibility they could provide, which could lead to the creation of a student-centered learning environment and potentially improved learning outcomes (Caldwell, 2018; Rofiah et al., 2022). Positive attitudes were also testified by EFL students in Spain (Rodrigo, 2017), China (Wu, 2019), and Ecuador (Cabrera-Solano et al., 2020). Therefore, the integration of gamification into an English course should be an inspiration for teachers about what they can do more with internet-based applications (Apridayani et al., 2023).

2.2. Effects of gamified learning using Kahoot!, Quizizz, and Quizlet

2.2.1. DESCRIPTIVE FEATURES OF KAHOOT!, QUIZIZZ, AND QUIZLET

Kahoot!, Quizizz, and Quizlet represent transformative innovations in the digital educational landscape, each offering unique platforms that blend gamification with learning to enhance student engagement and pedagogical outcomes. Kahoot!, originating from a 2006 research project at the Norwegian University of Science and Technology, has evolved into a game-based student response system that encourages active participation through quiz-based competitions, aiming to make learning interactive and fun, yet its effectiveness in serious learning environments remains a topic of academic debate (Wang et al., 2007; Wang & Tahir, 2020). Quizizz, praised for its adaptability in quiz design and its capacity to engage students in both individual and collaborative learning settings, has been shown to surpass traditional platforms like Google Forms in fostering learning engagement through its innovative use of gamification elements (Basuki & Hidayati, 2019; Zainuddin et al., 2020). Quizlet, founded by Andrew Sutherland in 2005, leverages flashcard software to support paired-associate learning, boasting a significant user base and a vast repository of study materials, though its scheduling and retrieval features may not fully meet the needs of progressive learning schedules. Despite these limitations, Quizlet's versatility and global reach underline its effectiveness in facilitating vocabulary and grammar acquisition and promoting independent learning (Waluyo & Bakoko, 2021; Waluyo & Bucol, 2021). Collectively, these platforms illustrate the dynamic interplay between gamification and education, offering varied tools for educators and learners to enhance the educational experience in the digital age.

2.2.2. GRAMMAR

Zarzycka-Piskorz (2016) discovered that grammar learning conducted through Kahoot! is more successful than traditional grammar exercise. It incorporates a playful component that has an effect on students' experiences

and attitudes while playing the game. It boosts their drive and decreases their anxiety as they play and learn. In the Indonesian context, Maesaroh et al. (2020) investigated the efficiency of teaching grammar to students with varying interests using Kahoot! and discovered that the app was effective at teaching grammar. As they stated, "Kahoot multimedia is an effective way to teach grammar to kids who are disinterested in the subject because it results in considerable improvements in students' grammatical achievement" (p. 371). Similarly, Kim (2019) and Susilowati (2017) discovered that Kahoot! is a successful tool for teaching and learning grammar to university students by increasing their motivation and encouraging them to utilize their language creatively and communicatively. Kahoot! can be used by teachers to teach a variety of grammar concepts, including irregular verb forms, question types, question constructions, passive voice, reported speech, conditionals, and subjunctives.

Quizizz is another pedagogical application that can be used to improve learners' language skills and areas. According to Rahayu and Punawarman (2019), gamified quizzes promote interactivity between users and the quiz, which leads to an increase in student motivation. Quizizz's leaderboards increased learner engagement in authentic learning environments by instilling a sense of competition. Quizizz's immediate feedback encourages students to self-correct. The students locate the grammar questions that they did not correctly answer and then go over them again. This improves students' understanding and performance. For example, Fadhilawati (2021) used Quizizz in her grammar class to teach and evaluate relative pronouns, and she discovered that it helped students improve 19.5% of their scores. Quizizz was perceived by students as a fun and motivating app, particularly because of its unique features. Similarly, Dewi et al. (2020) discovered in their quasi-experimental study that Quizizz is one of the best TEFL applications because it provides a multiplayer classroom activity that allows all students to practice together using a computer, an iPad, a tablet, and a smartphone.

Quizlet is also one of the most widely used tools in EFL learning and teaching (Anjaniputra & Salsabila, 2018; Dizon, 2016; Sanosi, 2018). Yuliyanto and Fitriyati (2019) believed that Quizlet aids students in understanding grammar in three ways: first, it dynamically stimulates students' interest through interactive learning; second, it eases the learning process through its features; and third, it simplifies students' learning through its flexibility, as students can learn wherever they are using the Quizlet app on their mobile. Peter et al. (2019) used Quizlet to improve students' grammar in Malaysian primary and secondary classes through a project-based activity that integrated with two modules. They analysed how students learned grammar terms and definitions from Quizlet's features such as flashcards, audio features, games, and teachers' feedback. Students were observed to have changed their learning grammar

behavior to be more relaxed, and, as a result, they progressed in their grammar learning. Students performed better on their post-test after being treated with Quizlet.

2.2.3. VOCABULARY

Kahoot!, Quizizz, and Quizlet are useful apps for L2/foreign language learning, particularly for expanding the vocabulary of EFL students (Medina & Hurtado, 2017; Yip & Kwan, 2006). Few studies have specifically addressed the use of Kahoot! in L2 vocabulary acquisition. Abrams and Walsh (2014) discovered that using technology-based apps like Kahoot! for vocabulary teaching increased student vocabulary scores assessed at the end of the class. Similarly, Medina and Hurtado (2017) state that "Kahoot! is an excellent choice for teaching university students in any subject, especially when teaching and practicing vocabulary in a language class" (p. 447). They develop a strong desire to use their phones or tablets to learn new vocabulary or grammar rules. It creates a positive environment in the classroom, boosts motivation, and adds fun.

Vocabulary is regarded as the most important aspect of language acquisition because it enables learners to read, speak, listen, and comprehend the language when it is used (Saville-Troike & Barto, 2016). Quizizz is one of the most widely used applications for assessing students' knowledge and learning progress (Huei et al., 2021). It provides various vocabulary quizzes that teachers can use in their daily classes. Quizizz's flexibility is one of its best features, as it can be used anywhere and at any time if students have access to the internet. It is simple to use, free, and easily accessible. The teacher can use pre-made quizzes or create their own that correspond to the target vocabulary list (Lim & Yunus, 2021). Quizizz, according to Ahmad et al. (2020), is superior to other applications because it has the potential to improve students' vocabulary learning. It encourages students to interact and engage to learn new vocabulary, and it assists them in learning on their own through memory retention. Coumbe-Lilley and Shipherd (2020) use Quizizz to improve students' vocabulary achievement by incorporating learning vocabularies.

EFL learners in various contexts face a variety of challenges in their learning process, including a lack of motivation, anxiety, and a lack of vocabulary, all of which have a negative impact on students' receptive and productive skills (Schmitt, 2008). Despite this, game-based learning tools (such as Quizlet) can assist in overcoming some of these obstacles. According to Okkan and Aydin (2020), Quizlet boosts EFL learners' motivation through its various modules, which include games, flashcards, tests, and collaborative activities. Multiple-choice questions, matching, writing, listening, and voice recording are among the activities included in these modules (Grigoropoulos et al., 2021). These various activities direct learners to the sound vocabulary learning process while immersing them in a fun learning environment with immediate

feedback. Similarly, Anjaniputra and Salsabila (2018) discovered that Quizlet increased learners' engagement and interests in vocabulary learning due to its efficacy and convenience for the learners.

3. Methodology

3.1. Research design

This study implemented gamified grammar and vocabulary learning respectively in an English course at a university in Thailand. It aimed to investigate the effects of gamified English learning using Kahoot!, Quizizz, and Quizlet on learning performance, motivation, enjoyment, anxiety, and classroom dynamics and engagement. It also examined the effects of gamified learning on gender, proficiency, and learning outcomes. To achieve such goals, a quantitative research design was chosen. The research design allowed the researchers to compare students' perspectives and learning outcomes from two different stages of learning using descriptive and inferential statistics, which has been suggested for applied linguistic research such as this study (Fryer & Ginns, 2018). Various statistical techniques were performed to explore numerical data collected from survey questionnaires, grammar and vocabulary test scores, and English proficiency test results. The research design is depicted in Figure 1 below.

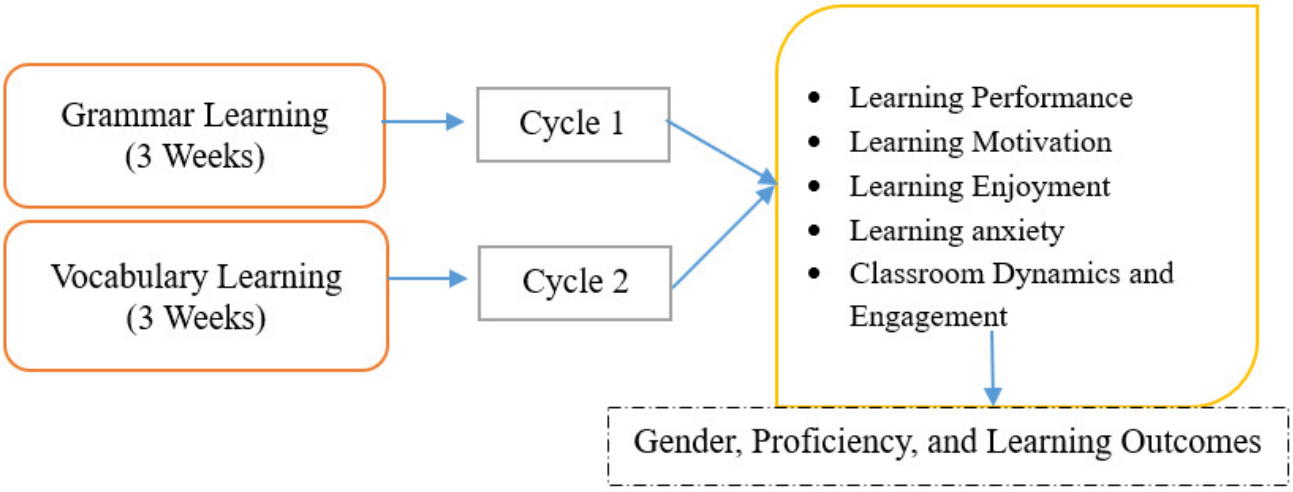


Figure 1. Illustration of the research design

3.2. Participants and the context

This study was conducted at an autonomous university in the south of Thailand. The participants consisted of 107 first-year students (88.8% females and 11.2% males) from School of Liberal Arts, School of Engineering and Technology, School of Allied Health Sciences, School of Nursing, and International College. According to the university's proficiency test results, 32.7% of the students were at the A1 level, 59.8% at the A2 level, and 7.5% at the B1 level, as defined by the Common European Framework of Reference for Languages (CEFR). All these students passed the university

English placement test and could take General English (GE) courses since the first academic term, and were not required to attend a foundation English course. Their ages ranged from 18 to 20 years old. The details are presented in Table 1.

Table 1. Demographic characteristics

		Frequency	%
Gender	Male	95	88.8
	Female	12	11.2
Faculty	School of Liberal Arts	21	19.6
	Walailak University International College	4	3.7
	School of Engineering and Technology	6	5.6
	School of Allied Health and Sciences	26	24.3
	School of Nursing	50	46.7
Age	18	50	46.7
	19	53	49.5
	20	4	3.7
CEFR Level	A1	35	32.7
	A2	64	59.8
	B1	8	7.5

3.3. Course design

This study explored the integration of gamification applications – namely Kahoot!, Quizizz, and Quizlet – within a one-term general English (GE) course targeted at first-year university students, framed by the Thai Qualifications Framework (TQF) for Higher Education. The course aimed to enhance both receptive (listening and reading) and productive (speaking and writing) language skills through integrated methods, while also focusing on the development of English sub-skills such as grammar and vocabulary, and fostering independent learning (Waluyo, 2019). The pedagogical strategy employed gamification through individual and group interactions with these applications, structured into two stages: initial instruction on learning materials followed by live, app-based quizzes to reinforce content understanding. This methodology alternated weekly between individual and group quiz participation, with immediate feedback provided via a projected live result board. The course was organized into two three-week cycles of content delivery and practice, with a testing phase in the fourth week of each cycle. The first cycle concentrated on grammatical aspects like the simple present tense, present continuous, and English articles, whereas the second cycle focused on academic vocabulary related to themes such as "At the Restaurant," "Future," and "History." Each cycle utilized Kahoot!, Quizizz, and Quizlet in successive weeks to gamify the learning content, with students' understanding assessed through multiple-choice tests administered via Socrative.com in the concluding week of each cycle, as presented in Table 2.

Table 2. The detailed implementation

Gamified English Learning					
Grammar			Vocabulary		
Week	Topic	Apps	Week	Topic	Apps
1	Present tense	Kahoot	5	At the Restaurant	Kahoot
2	Present continuous	Quizizz	6	Future	Quizizz
3	English articles	Quizlet	7	History	Quizlet
4	Test	Socrative	8	Test	Socrative

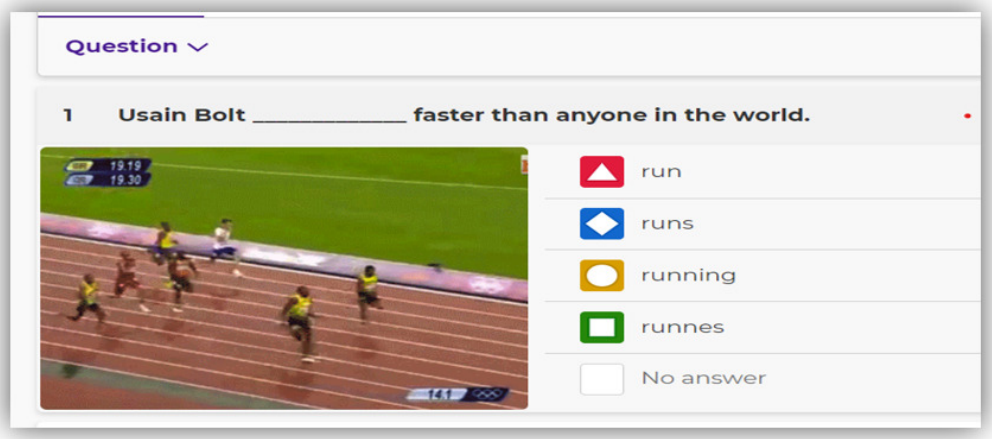


Figure 2. Sample of the Kahoot live quiz



Figure 3. Sample of the Quizizz live quiz

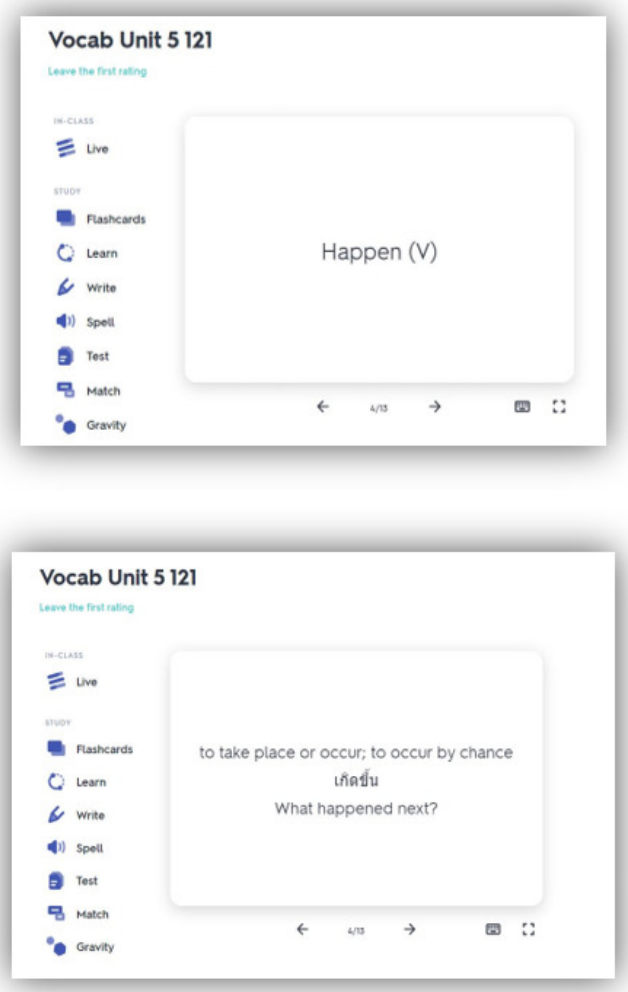


Figure 4. Gamified vocabulary learning using Quizlet

3.4. Instruments and measures

3.4.1. SURVEY QUESTIONNAIRE: ITEM, RELIABILITY, AND VALIDITY

This study used a survey questionnaire to elicit students' perceptions of gamification methods for English learning, based on Wang and Tahir's (2020) literature review. It assessed students' perceptions of the gamified grammar and vocabulary learning that had been implemented, focusing on learning performance, learning motivation, learning enjoyment, learning anxiety, and classroom dynamics and engagement. Each of these constructs was assessed using a five-item questionnaire. The responses ranged from Strongly Disagree (1) to Strongly Agree (5).

The questionnaire was distributed twice: once following gamified grammar learning (Cycle 1) and once following vocabulary learning (Cycle 2). Following data collection, the internal reliability of each Cycle 1 and Cycle 2

was determined. Cronbach's alpha was set to 0.70 as the minimum level of acceptability for items. The reliability results indicated that the questionnaire items had a high level of internal consistency, as depicted in Table 3.

Table 3. Constructs and internal reliability results

Constructs and Sample Statements	Cycle 1	Cycle 2
1. Learning performance	α = .893	α = .850
E.g., gamified learning through Kahoot, Quizziz, and Quizlet helps improve my understanding of the lesson in class.		
2. Learning motivation	α = .778	α = .804
E.g., gamified learning through Kahoot, Quizziz, and Quizlet increase my English learning motivation in class.		
3. Learning enjoyment	α = .729	α = .789
E.g., gamified learning through Kahoot, Quizziz, and Quizlet makes me enjoy learning English in class.		
4. Learning anxiety	α = .736	α = .817
E.g., gamified learning through Kahoot, Quizziz, and Quizlet reduces my anxiety in English learning in class.		
5. Classroom dynamics and engagement	α = .849	α = .869
E.g., my English class has become more dynamic with gamified learning through Kahoot, Quizziz, and Quizlet.		

The questionnaire was then validated using exploratory factor analysis (EFA), as recommended by Stapleton (1997). The KMO and Bartlett's tests determined that the following results were significant: ($\chi 2$ (300) = 1940.179, $p < .001$) with a sampling adequacy of 0.934 for Cycle 1, and ($\chi 2$ (300) = 1775.407, $p < .001$) with a sampling adequacy of 0.877 for Cycle 2. Both sampling adequacy results were significantly greater than the threshold of 0.50. These findings indicated that the survey constructs captured the information they were designed to capture, namely students' perceptions of the impact of gamified grammar and vocabulary learning on their learning performance, motivation, enjoyment, anxiety, and classroom dynamics and engagement. Additionally, all data were normally distributed, with no evidence of skewness or kurtosis values greater than +2 or -2 (George & Mallery, 2010). All these findings justified the continued use of survey data in the data analysis stage via parametric tests.

3.4.2. GRAMMAR AND VOCABULARY TESTS

At the conclusion of Cycle 1, students were administered a grammar test to assess their acquired grammatical knowledge. The multiple-choice questions covered the present tense, the present continuous, and English articles. The grammar quiz was administered by the teacher via Socrative.com, which required students to simply enter the room code and take the test for 15 minutes. The sample test questions are depicted in Figure 5 below.

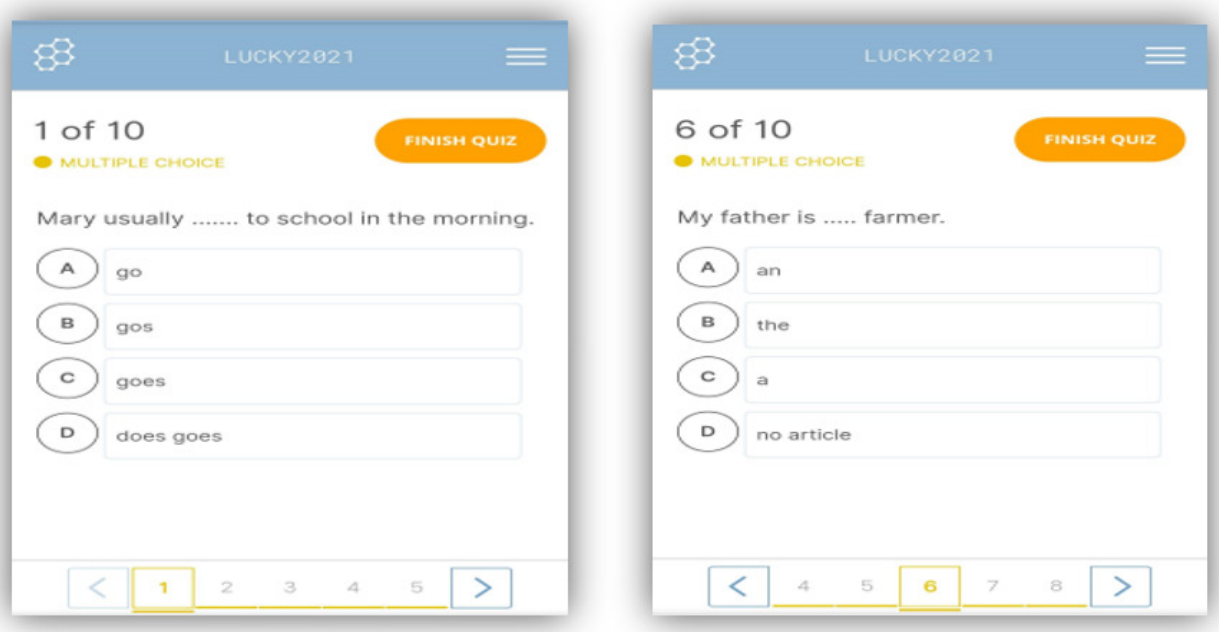


Figure 5. Sample grammar test questions

The average score on the grammar test was 8.78 (*SD* = 1.47), with skewness and kurtosis values less than 2, indicating normally distributed data. *SD* was greater than 1, demonstrating that there were some significant differences between students who achieved high and low scores.

At the conclusion of Cycle 2, students took a vocabulary test, which was also administered via Socrative.com. Multiple-choice questions were used to assess students' knowledge of the vocabulary words. The examination contained questions on definitions, synonyms, antonyms, parts of speech, and sentence completion. It lasted for 15 minutes. The sample test questions are depicted in Figure 6.

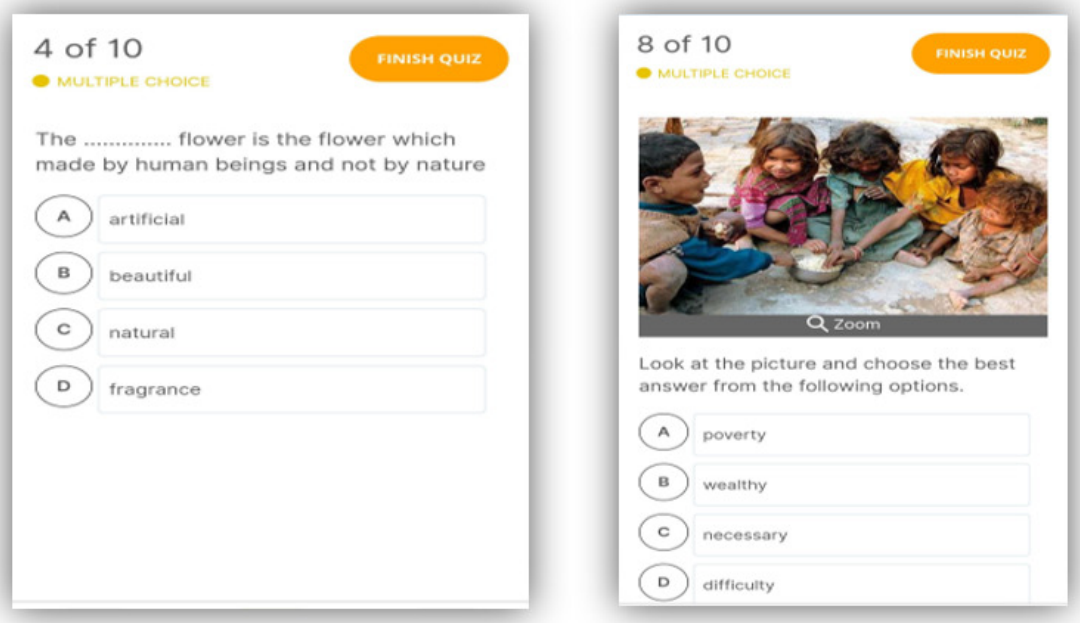


Figure 6. Sample vocabulary test questions

The students scored an average of 6.55 (SD = 1.64) on the vocabulary test, with skewness and kurtosis less than 2, emphasizing normal data. The high SD value reflected some significant differences between students who earned high and low scores.

3.4.3. ENGLISH PROFICIENCY TEST

Before students joined their second-year program, their English competence was assessed by the Walailak University University Test of English Proficiency (WUTEP). WUTEP is a test that is framed by the CEFR and Classical Test Theory (CTT). It tests learners' English proficiency levels both overall and in specific abilities such as listening, reading, writing, and speaking. Additionally, the findings are generated as scores in the A1, A2, B1, B2, and C1 languages (Waluyo, 2019). The test is based on other internationally recognized examinations such as the TOEFL, IELTS, and TOIEC. The reliability and validity of this test as a measure of English proficiency has been confirmed by empirical studies published in internationally reputable journals (Apridayani & Teo, 2021; Rofiah & Waluyo, 2020). The test results can be seen in Table 1.

3.5. Data collection and analysis

The data were collected in week 4 (Cycle 1) and week 8 (Cycle 2). The grammar test and first survey results were collected in Cycle 1, while the vocabulary test and second survey results were collected in Cycle 2. The students' English proficiency levels were measured before the gamified learning took place. Then, after the collected data had been cleaned up, the data analysis process started. The data analysis involved such statistical

techniques as t-tests, one-way ANOVA, multiple-linear regression. Descriptive statistics were also utilized to illustrate the students' perceptions of the gamified learning effects. The means were interpreted in three categories: 0–2.49 (low), 2.5–3.49 (moderate) and ≥ 3.5 (high). Additionally, the learners' overall proficiency levels were grouped into three categories: A1 – Low level of proficiency; A2 – Moderate level of proficiency; and B1 and B2 – High level of proficiency. The significance level was set at < 0.05 with 95% confidence interval.

4. Results

4.1. The gamified learning effects on the five survey constructs

To determine the effects of gamified grammar and vocabulary learning, this study examined the Cycle 1 and Cycle 2 survey results. Analyzing these findings may provide a more complete picture of how students perceived the effects on the five survey constructs. Generally, across the two cycles, the students reported that the implemented gamified grammar and vocabulary highly improved their learning performance, motivation, enjoyment, anxiety, and classroom dynamics and engagement as indicated by the means greater than 3.5 (high level). In Cycle 1, the greatest beneficial effect was on improving learning performance (M = 4.31, SD =.67), followed by increasing learning enjoyment (M = 4.16, SD =.63), classroom dynamics and engagement (M = 4.07, SD =.66), learning motivation (M = 4.06, SD =.65), and learning anxiety (M = 3.89, SD =.65). The SD values, all below one, suggest that the students' opinions exhibited a high degree of consensus, with most surveyed individuals sharing similar views, thereby mitigating the presence of outliers or extreme opinions that could potentially distort the overall interpretation. Furthermore, the Cycle 2 survey results indicated that gamified learning had a slightly increased effect on each survey construct: learning performance remained the most positively impacted (M = 4.36, SD =.51), followed by classroom dynamics and engagement (M = 4.22, SD =.57), learning motivation (M = 4.21, SD =.58), learning engagement (M = 4.14, SD =.66), and learning anxiety (M = 4.06, SD =.70). As substantiated by the minimal SD values, there was little variation in these perceptions among the students. These descriptive findings indicated that both gamified grammar and vocabulary learning enhanced students' performance on all survey dimensions, but they had a negligible effect on reducing students' learning anxiety.

Additionally, the descriptive statistics disclosed that when the three gamification apps were integrated into an English course in the grammar and vocabulary lessons, it would most likely result in positive effects; as shown in Figure 7, below, despite fluctuations, the means remained at a high level (> 3.5).

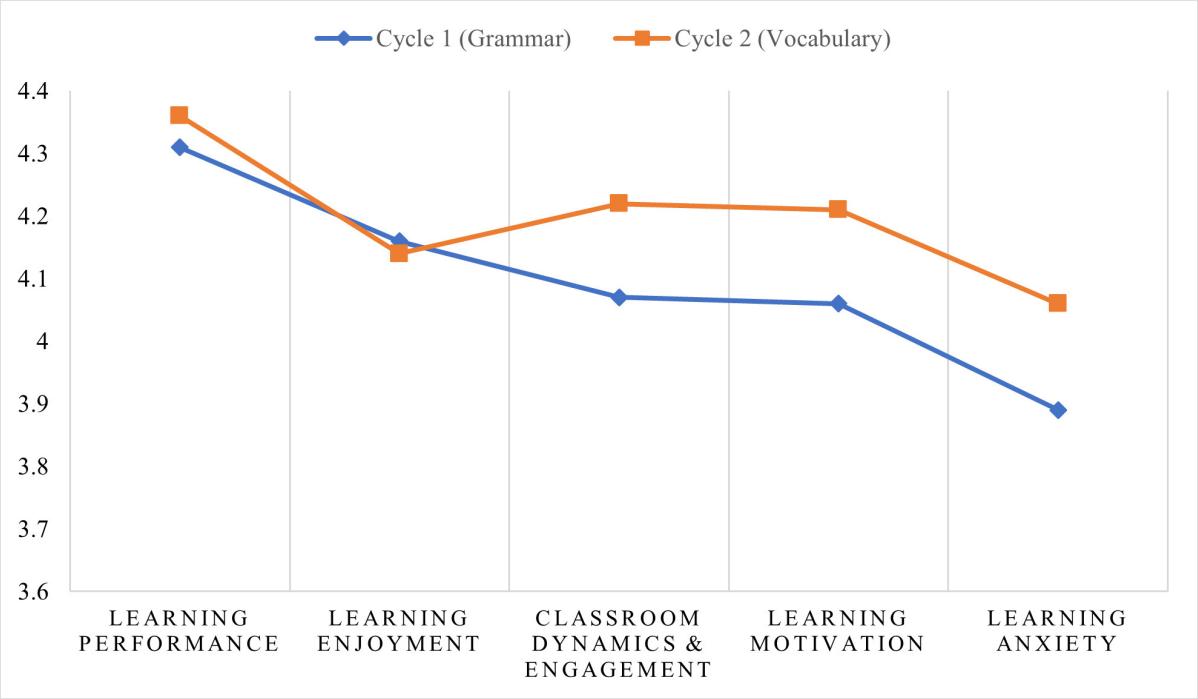


Figure 7. Gamified learning effects in Cycles 1 and 2

The analysis was continued with paired-sample t-tests to check for significant differences in the students' perceptions of the effects of gamified learning from Cycle 1 to Cycle 2. The confidence interval percentage was set up at 95%. The results disclosed there were significant differences for learning motivation t (106) = -2.71, p = .01, with Cohen's d = (4.20 - 4.04) / .62 = .27; learning anxiety t (106) = -2.83, p = .01, with Cohen's d = (4.05 - 3.88) / .68 = .24; and classroom dynamics and engagement t (106) = -2.31, p = .02 with Cohen's d = (4.21 - 4.06) /.615 =.23). According to Cohen's (1992) recommendation, all the results above signified small effect sizes. In contrast, non-significant differences were observed for learning performance t (106) = -.74, p =.46 with Cohen's d = (4.34 - 4.30)/ .60 =.07), and learning enjoyment t (106) =.10, p =.92 with Cohen's d = (4.14 - 4.15)/ .64 =.01). Both, however, had extremely small effect sizes, as demonstrated by Cohen's d coefficients. These t-test results revealed that after experiencing both gamified grammar and vocabulary learning, the students' perceptions of the effects of gamified learning improved, particularly in terms of increasing learning motivation, reducing learning anxiety, and increasing classroom dynamics and engagement. Their perceptions of the effects of gamified learning on learning performance and enjoyment, on the other hand, remained consistent.

4.2. The gamified learning effects on gender

Independent t-tests were used to determine whether the effects of gamified learning on learning performance, motivation, enjoyment, anxiety, as well as classroom dynamics and engagement levels, differed by gender. The findings revealed no statistically significant differences between Cycles 1 and 2. Table 4 contains the detailed results.

Table 4. Overview of the effects of gender and English proficiency background level on gamified learning

Constructs	Gender		English proficiency background	
	Independent t-test $t(1, 105)$		One-way ANOVA $F(df = 2)$	
	Cycle 1	Cycle 2	Cycle 1	Cycle 2
Learning performance	-.915	-.649	1.780	2.192
Learning motivation	-1.007	-.396	1.593	3.192
Learning enjoyment	-.778	-1.655	1.657	3.824*
Learning anxiety	-1.503	-1.612	.394	1.014
Engagement and classroom dynamics	-1.328	-1.256	3.179	3.603*

* $p < .05$

4.3. The gamified learning effects on students with different proficiency levels

One-way ANOVA was run to explore the gamified learning effects on students with varying English proficiency levels, encompassing A1, A2, and B1, in both cycles. In Cycle 1, the ANOVA results did not depict significant differences in learning performance, motivation, enjoyment, anxiety, and classroom dynamics and engagement; yet, the Tukey post-hoc test pointed out that the gamified grammar learning had a higher effect on B1 students' classroom dynamics and engagement (M = 4.55, SD =.66) than those at A1 level (M = 3.92, SD =.82) with the p-value = .04 and the overall effect size f = .25 (medium). In Cycle 2, different results were observed: students' enjoyment (F (2, 104) = 3.82, p = .03) and classroom dynamics and engagement (F (2, 104) = 3.60, p = .03) significantly varied as a function of English proficiency, whereas the scores were significantly different for students' learning performance, motivation, and anxiety. The Tukey post-hoc tests unveiled that B1 students enjoyed the gamified vocabulary learning more (M = 4.70, SD =.36) than A2 students did (M = 4.05, SD =.69), and they were also more dynamic and engaged during the learning process (M = 4.65, SD =.45) than A2 students (M = 4.11, SD =.58). The effect sizes were at medium levels: f = .27 and f = .26, respectively.

These findings showed that the implementation of gamified grammar and vocabulary learning had a continuous and positive effect on classroom dynamics and engagement in both cycles, with a greater impact on higher-level students than on lower-level students. Moreover, gamification made vocabulary learning more enjoyable for advanced students. On the other

hand, these ANOVA results showed that students' learning performance, motivation, and anxiety remained constant across the two cycles, underlining that English proficiency had no effect on the effects of gamified learning on students learning English grammar and vocabulary.

4.4. The gamified learning impacts on learning outcomes

To evaluate the impact of gamified learning on learning outcomes, multiple bivariate and linear regression analyses were conducted. Students' perceptions of the gamified learning effects on learning performance, motivation, enjoyment, anxiety, and classroom dynamics and engagement (independent variables) were regressed on their grammar and vocabulary test results (dependent variables). The results demonstrated that despite the students' highly rated effects of grammar gamified learning on the five survey constructs, there was no significant correlation observed between each of the constructs and students' grammar test results; as a result, students' ratings on these five constructs could not explain the outcomes variances in grammar learning.

In contrast, two constructs, i.e., learning enjoyment *($r = .20$, $p = .037$)* and anxiety *($r = .30$, $p = .002$)*, were closely associated with students' vocabulary test results, but the strengths of the correlations were weak as echoed by the small Pearson's coefficients: $r < .50$. Both constructs were significant predictors of students' learning outcomes in vocabulary. First, learning enjoyment could predict 20% ($R^2 = .202$) of the variability in the vocabulary test results (t (1, 106) = 2.116, $p = .037$). Every one unit increase in the students' enjoyment as the effect of the gamified learning would result in an increase of .494 in students' vocabulary results with a medium effect size ($f^2 = .25$). Second, learning anxiety could explain a higher amount of variability, namely 30% ($R^2 = .299$), in the vocabulary results (t (1, 106) = 3.208, $p = .002$). It was estimated that when students' learning anxiety was reduced by one unit, students' vocabulary results would improve by .684 with a large effect size ($f^2 = .43$).

5. Discussion

Some earlier research in this field has proven the positive impact of Kahoot! in grammar learning on students' English learning motivation (Kim, 2019; Susilowati, 2017), learning performance (Maesaroh et al., 2020), and students' learning experiences and attitudes (Zarzycka-Piskorz, 2016). Fadhilawati (2021) discovered that Quizizz helped students boost their scores by 19.5 percent and was popular among them (Dewi et al., 2020). The usage of Quizlet in grammar courses was also found to have a positive effect on student participation (Peter et al., 2019; Yuliyanto & Fitriyati, 2019). Meanwhile, when integrated into vocabulary instruction, these three applications improved students' learning performance and classroom atmosphere by increasing motivation and adding fun (Abrams & Walsh,

2014; Medina & Hurtado, 2017; Okkan & Aydin (2020), learning achievement (Coumbe-Lilley & Shipherd, 2020), and learning engagement and interests (Anjaniputra & Salsabila, 2018). The findings of the present study contribute to the comprehension that integrating the three gamification apps into an English course, particularly in the context of grammar and vocabulary lessons, is likely to yield positive outcomes, as seen in Figure 7.

Second, the findings of this study indicated that the effects of gamified learning remained favorable at the same level for both female and male students in terms of learning performance, motivation, enjoyment, anxiety, and classroom dynamics and engagement levels. Even if different gamification apps were integrated into different learning instructions, the results would most likely be the same for both genders. Third, the results demonstrated that gamified grammar and vocabulary learning had a consistent and beneficial influence on classroom dynamics and engagement in both cycles, with a bigger impact on higher-level students than on lower-level students. Furthermore, gamification made advanced students' vocabulary study more pleasurable. Regardless of students' proficiency levels, the impacts on learning performance, motivation, and anxiety remained consistent. Studies examining differences in gamification effects on gender and English proficiency are still scarce. A recent study by Rofiah and Waluyo (2020) investigating Thai EFL students' acceptability of the usage of a gamification tool in vocabulary courses discovered a non-significant difference in gender and a substantial influence of proficiency levels, which would decide the learning outcomes. Significant improvement was demonstrated when gamified learning was explicitly applied to low-proficiency pupils in Thailand (Waluyo & Bucol, 2021).

Lastly, the results demonstrated that students' perceptions of the positive effects of gamified learning in grammar lessons were not significant predictors of their grammar learning outcomes. In contrast, in gamified vocabulary, students' perceptions of the positive effects on learning enjoyment and anxiety could significantly predict their vocabulary learning outcomes. It is important to note that students' learning anxiety was reduced by gamified learning and this reduction could help improve students' achievement by .684 (R^2 = .30) with a large practical effect.

Gamification has emerged as one alternative solution for improving learner vocabulary learning over the last decade. It can add a layer of fun by involving learners in game elements such as quests, challenges, levels, and rewards, which may increase motivation and participation in the learning process (Kingsley & Grabner-Hagen, 2018). Recently, Zou et al. (2019) reviewed 21 research papers published in SSCI journals that investigated digital game-based vocabulary learning and concluded: "(1) digital games promote effective vocabulary learning; (2) interactions in game environments are conducive

to vocabulary learning; (3) game-embedded multimedia facilitates vocabulary learning; and (4) over-specified vocabulary information is better than isolated or minimally specified information." (pp. 22-23). Abrams and Walsh (2014) developed gamified vocabulary learning instructions and used them in their classes with eleventh graders and young adult learners in New York City. They found that gamified vocabulary encouraged learners to be agents of their own learning and stimulated interest-driven learning.

5.1. Implication of the findings

The findings from this research elucidate significant pedagogical considerations for embedding gamified learning within English language education, particularly in teaching diverse linguistic skills such as grammar and vocabulary. The study reveals that students generally hold positive dispositions towards gamified learning, with these attitudes enhancing over time, especially in the Thai educational context where tools like Kahoot!, Quizizz, and Quizlet are prevalently utilized by university educators (Ulla et al., 2020). This positive inclination emphasizes the necessity for careful planning and the formulation of supportive educational policies, as delineated by Ulla et al. (2021), to ensure a balanced integration of technological advancements in gamification with the multifaceted roles of educators. Such policies are pivotal in guiding educators through the complexities of adopting gamified learning methodologies.

Moreover, the differentiation in student engagement based on gender and English proficiency levels indicates the importance of tailored gamified learning experiences. Specifically, the varied engagement levels between students of different proficiency levels suggest that gamified learning could differentially impact learning outcomes, reinforcing the findings of Waluyo and Bucol (2021) on its potential to significantly benefit learners at lower proficiency levels. Additionally, the study identifies a link between student enjoyment and anxiety in gamified learning environments and their performance, particularly in vocabulary acquisition. While previous studies (e.g., Dehghanzadeh et al., 2019; Mazhar, 2019) have highlighted the broadly positive effects of gamification on learning, the direct influence of these effects on learning outcomes remains variable, suggesting the need for ongoing evaluation of learning achievements when implementing gamified approaches. The propensity of gamified learning to enhance teacher evaluations further attests to its beneficial impact on teaching efficacy, provided that it is strategically planned and executed within a framework that accommodates the diverse needs and proficiency levels of learners, thereby ensuring a comprehensive and effective educational experience.

6. Conclusion

Based on the findings, this study concludes that the effects of gamified grammar and vocabulary learning were perceptibly high. Continuous implementation of gamified learning in an English course involving multiple lessons or skills will improve learning motivation, reduce learning anxiety, and create a more dynamic and engaging learning environment. Therefore, it is recommended that English teachers at the university level, particularly in Thailand, consider incorporating gamification apps into their English course instruction. However, this study showed that while the perceived positive effects of gamified learning could not predict students' learning outcomes in grammar, the degrees of students' learning enjoyment and anxiety significantly predicted their achievement in vocabulary lessons.

Still, this study acknowledges several limitations. This study did not include a control group that could have served as a comparison. It only investigated one group, with an emphasis on quantitative analyses. Thus, future research should include experimental research designs and the collection of qualitative data; in this case, it will be possible to see how consistent the findings of this study are.

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