

RESEARCH TITLE

**The Impact of Digital Gamification on Vocabulary Acquisition
Across English Proficiency Levels Among Ninth-Grade EFL
Learners: A Quasi-Experimental Study**

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Abstract

Vocabulary acquisition remains a persistent challenge for English as a Foreign Language (EFL) learners, particularly in mixed-proficiency classrooms where conventional instructional approaches often fail to sustain learners' different levels. Although digital gamification has demonstrated potential for enhancing language learning, limited research has examined its effectiveness across different English proficiency levels within authentic school settings. This study investigated the impact of a digital gamified vocabulary intervention on vocabulary acquisition among ninth-grade EFL learners with low, intermediate, and high English proficiency levels. The study employed a quasi-experimental pretest-posttest design with proficiency-based subgroup comparisons. Fifty-four ninth-grade EFL learners from two intact classes were classified into three proficiency groups (low, intermediate, and high) based on their pretest scores. Participants engaged in a structured digital gamified vocabulary intervention using the Blooket platform. Data were collected using a researcher-developed Vocabulary Achievement Test administered before and after the intervention. Statistical analyses included within-group and between-group comparisons to examine changes in vocabulary achievement across proficiency levels. The findings revealed a statistically significant improvement in vocabulary achievement following the intervention, with the overall mean score increasing from 47.53% to 63.46% and a large effect size (Cohen's $d = 0.82$). Although all proficiency groups achieved significant vocabulary gains, the magnitude of improvement differed significantly across groups ($p = .032$), with low-proficiency learners demonstrating the greatest mean gain. The study concludes that digital gamification is an effective instructional approach for improving vocabulary acquisition in mixed-proficiency EFL classrooms. This research contributes empirical evidence supporting the integration of theory-informed digital gamification into vocabulary instruction.

Keywords: Digital Gamification, Vocabulary Acquisition, Mixed-Proficiency EFL Classrooms, Ninth-Grade Learners

أثر التلعيب الرقمي في اكتساب المفردات عبر مستويات الكفاءة في اللغة الإنجليزية لدى طلبة الصف التاسع المتعلمين للإنجليزية لغةً أجنبية: دراسة شبه تجريبية

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المستخلص

يظل اكتساب المفردات تحديًا مستمرًا لدى متعلمي اللغة الإنجليزية لغةً أجنبية، ولا سيما في الصفوف التي تضم متعلمين متفاوتي الكفاءة، حيث غالبًا ما تعجز أساليب التدريس التقليدية عن تلبية احتياجات مستوياتهم المختلفة بصورة مستدامة. وعلى الرغم من الإمكانيات التي أظهرها التلعيب الرقمي في تعزيز تعلم اللغة، فإن الدراسات التي تناولت فاعليته عبر مستويات مختلفة من الكفاءة في اللغة الإنجليزية ضمن بيئات مدرسية فعلية ما تزال محدودة. وقد بحثت هذه الدراسة أثر تدخل تعليمي قائم على التلعيب الرقمي في اكتساب المفردات لدى طلبة الصف التاسع المتعلمين للإنجليزية لغةً أجنبية من ذوي مستويات الكفاءة المنخفضة والمتوسطة والمرتفعة. واعتمدت الدراسة تصميمًا شبه تجريبي باستخدام القياسين القبلي والبعدي، مع إجراء مقارنات بين مجموعات فرعية مصنفة بحسب الكفاءة. وشارك فيها 54 طالبًا من طلبة الصف التاسع من شعبتين صفيتين قائمتين، صُنِّفوا إلى ثلاث مجموعات وفق درجاتهم في الاختبار القبلي: منخفضة الكفاءة ومتوسطة الكفاءة ومرتفعة الكفاءة. وخضع المشاركون لتدخل تعليمي منظم قائم على التلعيب الرقمي لتعلم المفردات باستخدام منصة بلوكيت (Blooket). وجمعت البيانات بواسطة اختبار تحصيلي للمفردات أعدّه الباحثان، وطُبِّق قبل التدخل وبعده. وشملت التحليلات الإحصائية مقارنات داخل المجموعات وفيما بينها لفحص التغير في تحصيل المفردات عبر مستويات الكفاءة. وأظهرت النتائج تحسنًا دالًا إحصائيًا في تحصيل المفردات عقب التدخل؛ إذ ارتفع المتوسط العام للدرجات من 47.53% إلى 63.46%، مع حجم أثر كبير (d لكوهين = 0.82). وعلى الرغم من تحقيق جميع مجموعات الكفاءة مكاسب دالة في المفردات، فقد اختلف مقدار التحسن بينها اختلافًا دالًا إحصائيًا ($p = 0.032$)، وسجل المتعلمون منخفضو الكفاءة أكبر متوسط للتحسن. وخلصت الدراسة إلى أن التلعيب الرقمي أسلوب تدريسي فعال لتحسين اكتساب المفردات في صفوف تعلم الإنجليزية لغةً أجنبية التي تضم مستويات كفاءة متفاوتة، وقدمت أدلة تجريبية تدعم دمج التلعيب الرقمي المستند إلى أسس نظرية في تدريس المفردات.

الكلمات المفتاحية: التلعيب الرقمي، اكتساب المفردات، صفوف تعلم الإنجليزية لغةً أجنبية ذات مستويات الكفاءة المتفاوتة، طلبة الصف التاسع.

1. Introduction

Vocabulary knowledge is a foundational component of English as a Foreign Language (EFL) proficiency. It supports comprehension, oral communication, and meaningful language interaction. Vocabulary is a particularly persistent problem in the case of EFL learners in the ninth grade. At this age, learners are expected to move beyond basic vocabulary recognition toward more advanced academic language use, including explaining, discussing, and expressing ideas orally. Nevertheless, several learners who are in ninth grade have an issue retaining newly acquired vocabulary and transferring vocabulary knowledge into active spoken use.

Learners in ninth-grade EFL classroom vary considerably in their English proficiency levels. Lower-proficiency learners may experience frustration when vocabulary tasks exceed their language abilities, whereas higher- proficiency learners may find traditional instruction insufficiently challenging. The comparison of the proficiency levels is consequently critical to the knowledge of whether a gamified vocabulary intervention is beneficial to all learners, or whether it functions differently with low, intermediate, and high proficiency levels. The analysis of these distinctions makes it possible to consider the effectiveness of instruction in a more sophisticated way and provides some answers to the question of how gamified models can be modified to meet the needs of learners of diverse types in the same classroom.

In recent years, gamification has emerged as a promising instructional approach in EFL education. Based on learning theories like cognitivism, gamification may enhance learners' sense of autonomy, and competence. Gamified environments can transform vocabulary learning from a passive activity into an interactive learning experience that encourages participation, repetition, and contextual language use (Zolfaghari et al., 2025). The feeling of autonomy, competence, and engagement among learners. This research explores gamification as a pedagogical approach with the aim of exploring the impact of a digital gamified vocabulary intervention on vocabulary achievement across three English proficiency levels among ninth-grade EFL Learners. Despite the growing interest in gamification, limited research has examined how digital gamified vocabulary instruction influences vocabulary acquisition across different English proficiency levels. Therefore, the current study investigates the impact of digital gamified vocabulary intervention on vocabulary acquisition among ninth-grade EFL learners with varying proficiency levels.

1.1 Problem of the study

Vocabulary learning has continued to be one of the challenges facing ninth-grade EFL learners, particularly in contexts where exposure to English is largely limited to the classroom. Traditional vocabulary instruction in many classrooms is often characterized by memorization, drilling, and textbook-based activities that provide limited opportunities for meaningful language use and sustained learner engagement.

Although digital tools are increasingly used in educational settings, the challenge does not lie in the availability of technology itself, but rather in the pedagogical integration of these tools to support meaningful vocabulary learning. Game-based activities have been proposed to make vocabulary learning more interactive, contextualized, and engaging. However, in many EFL classrooms, games are often used as occasional entertaining activities rather than systematically designed instructional interventions grounded in learning theories. Consequently, its contribution to vocabulary development remains limited.

Existing literature on the use of gamification in EFL settings has shown that it has positive effects on vocabulary acquisition. However, the literature implies that there are various

crucial gaps. To begin with, most studies concentrate on short-term interventions or platforms in general and highlight the overall gains of a group without considering the response of learners with different proficiency levels to gamified instruction. Lastly, empirical studies conducted in authentic school-based EFL settings that systematically integrate gamification principles while accounting for proficiency differences remain limited.

Furthermore, learners are not a homogeneous group; vocabulary proficiency can affect the way learners interact with the learning games, process vocabulary input, and engage with gamified learning environments. Learners with low proficiency might need additional support and scaffolding, whereas more advanced learners might react differently to challenges, competition, and freedom in games. Although gamification is becoming more prevalent in EFL contexts, it is not known if gamified vocabulary interventions work for learners of all proficiencies. Thus, the current study systematically examines the impact of digital gamified vocabulary instruction on vocabulary learning for low-, intermediate-, and high-proficiency EFL learners. Doing so can help provide insight into pedagogical uses of gamification for vocabulary learning among learners of different proficiency levels.

1.2 Importance of the Study

This study is important because it addresses the learning needs of digitally immersed learners by implementing a gamified vocabulary intervention that supports vocabulary acquisition. The study highlights the gap in the pedagogical integration of gamification within EFL vocabulary instruction. It demonstrates how gamified learning environments, grounded in learning theories, may create more effective EFL learning experiences.

1. **Addressing the Generation Gap in Learning:** This study recognizes that learners these days have different learning preferences compared to prior generations because they are digital natives. Many learners have grown up using computers and technology to learn through interaction instead of passively listening to lectures. The research addresses the gap by gamifying vocabulary learning.
2. **Helping Learners Improve Their Vocabulary Skills:** Learners who engage in meaningful activities as described in this study will have more exposure to target vocabulary. They will be more actively engaged during lessons and receive immediate feedback on their performance. These are all benefits that can help learners to learn and use more English vocabulary with confidence.
3. **Adding to the Body of Gamification Research:** Previous research has discovered that using games can help learners learn various subjects. This study adds to the research by providing evidence that gamification can be a fundamental component for different proficiency levels through gamified activities.
4. **Applications for Teachers and Curriculum Developers:** The results can help teachers and curriculum developers interested in finding successful methods for more effective vocabulary teaching. The gamified tasks used in this experiment can be adapted for classroom use. They can add engagement to lessons while helping learners meet learning goals. Therefore, this research can apply to teachers in many contexts.
5. **Encouraging Learner-Centered Instruction:** This research also encourages learner-centered instruction. Learners are active, work with each other, and have autonomy during the learning experience. Learners do not simply sit and listen to information. Instead, they experience vocabulary through game-like tasks and meaningful challenges.

1.2.1 Theoretical Importance

This study added to the theoretical framework of vocabulary acquisition by analyzing the underlying principles of gamified learning, including spaced repetition, contextualized learning, and immediate feedback. The study offered data on whether gamification can facilitate learner vocabulary retention and acquisition throughout the spectrum of English proficiency levels in EFL contexts.

1.2.2 Practical Importance

The results from this study may allow EFL teachers and curriculum planners to better implement gamified activities into their vocabulary lessons. Furthermore, this research may provide support for the implementation of digital learning games as a tool for practice, and retention of vocabulary at various levels of proficiency.

1.3 Objectives of the Study

The purpose of this study was to examine the effects of gamified vocabulary intervention on vocabulary achievement among ninth-grade EFL learners and to compare these effects across different English proficiency levels.

1.3.1 General Objective

To investigate the effect of a digital gamified vocabulary intervention on vocabulary achievement among ninth-grade EFL learners across different proficiency levels.

1.3.2 Specific Objectives

1. To implement and evaluate the digital gamified vocabulary intervention in a practical EFL learning environment.
2. To measure the difference in EFL learners' vocabulary achievement before and after participation in the digital gamified vocabulary intervention.
3. To compare vocabulary gains across the different proficiency levels of ninth-grade EFL learners.

1.4 Research Questions

1. What is the effect of a digital gamified vocabulary intervention on ninth-grade EFL learners' vocabulary achievement?
2. Does the impact of the gamified intervention on vocabulary achievement differ across proficiency levels (low, intermediate, high)?

1.5 Research Hypotheses

1. There is a statistically significant difference between learners' pre-test and post-test vocabulary achievement scores following the gamified intervention.
2. Vocabulary achievement gains differ significantly across low-, intermediate-, and high-proficiency learners.

1.6 Theoretical Framework

1.6.1 Learning Theories in Game Design (Learning Process/Vocabulary learning theory)

Designing instructional games that support meaningful learning requires more than just adding fun elements; it involves understanding how those elements help learning happen. For this reason, game designers need a solid grasp of how different game features work from an educational standpoint. Learning theories offers that foundation. Cognitivism, constructivism,

and experiential learning can guide the use of gamification elements in ways that genuinely support learning (Ahmad et al., 2019).

1.6.1.1 Cognitivism

Ertmer and Newby (2013) note that cognitivism focuses on helping learners make sense of new information by connecting it to what they already know. Because of this Ahmad et al. (2019) pointed out that an effective instructional design should consider three main points: prior knowledge, structured scaffolding, and structured practice with feedback to support cognitive integration. The implication of cognitivism on gamification elements can be seen in cognitive difficulty through levels (Rutkauskiene et al., 2016), and through explanatory feedback as it provides explanations for correct or incorrect responses, helping learners integrate existing and new knowledge, enabling deeper understanding and learning through trial-and-error (Zhou & Brown, 2017).

1.6.1.2 Constructivism and Experiential Learning

The constructivist theory also focuses on the idea that learners interpret new knowledge by relating it to their previous experiences, which leads to personalized meanings (Schunk, 2012; Ertmer and Newby, 2013). When teachers choose materials that allow these types of connections, effective learning will be possible. Experiential Learning Theory (Kolb, 1984) expounds on constructivism by offering four stages, namely, concrete experience, reflective observation, abstract conceptualization, and active experimentation. The use of gamification in instructional games, including explanatory feedback, comes to aid learners in the connection between errors and previous knowledge to enhance their understanding and performance (Ahmad et al., 2019; Tärning, 2018).

1.6.2 Gamification

Building on these theories, educational gamification design principles can be designed to support vocabulary acquisition in ways that support the cognitive and emotional needs of the current school generations- Generation Z and Generation Alpha.

Following this definition, Christopoulos and Mystakidis (2023) defined Gamification as gameful design, involves bringing ideas and elements from games into settings that are not games. This approach, often supported by digital tools, is used to help people stay focused on their goals. By creating a more playful and interactive environment, it can strengthen users' sense of autonomy, competence, and connection with others. Originally emerging from areas such as education, business, marketing, and customer service, gamification has become a flexible method for improving experiences and adding value in many different contexts. Its growing influence has reshaped traditional ways of engaging learners and participants, especially within education (Zhang and Hasim, 2023).

1.6.2.1 Gamification in EFL settings

Gamification in the EFL/ESL environment has always yielded positive results in terms of vocabulary learning. Empirical research concluded that gamified applications such as Duolingo, Minecraft, Runescape, Blooket, Kahoot, and so forth, are useful in improving the acquisition of vocabulary (Ajisoko, 2020; Garzon et al., 2023; Tuomainen, 2023; Kim, 2015; Sinaga et al., 2025; Ebadi et al., 2023). Dindar et al. (2021) compared gamified collaboration and competition and discovered that the two approaches promoted equally in the task effort and learning success of learners who studied new English words. Almusharraf (2021) has observed that there is a favorable attitude towards the use of Kahoot in the revision of vocabulary in online English literature courses.

1.6.6 Student-centered approach

The needs and interests of learners are at the center of the educational process when using the student-centered approach to teaching and learning. To establish a learning environment that supports, challenges, and fits with learners' needs and aspirations, it places a strong emphasis on student autonomy, involvement, and teamwork (Kerimbayev et al., 2023).

2. Literature review

Tayeh et al. (2024) investigated the impact of gamified instruction on the English language performance of Jordanian EFL learners, offering evidence relevant to ongoing discussions regarding the pedagogical value of gamification in foreign language contexts. Working with a sample of 120 fourth-grade learners equally assigned to gamified and traditional instructional conditions, the researchers assessed vocabulary, grammar, and reading comprehension through standardized pretests and posttests. Their results demonstrated that learners who received gamified instruction achieved significantly higher gains across all skill areas, with vocabulary showing the greatest improvement. They echo regional studies highlighting the potential of game-based approaches to address persistent challenges in Jordanian English classrooms. Collectively, this study contributes to the growing body of literature affirming that appropriately designed gamified environments can support more effective language learning by fostering sustained participation, reinforcing key language skills, and creating more engaging instructional experiences.

Kim (2015) study explored using the MMORPG 'RuneScape' to engage Korean EFL (English as a Foreign Language) young learners in learning vocabulary and reading skills. The study's participants were five elementary learners (one girl and four boys, aged 10–11) from a private English institute in South Korea. Each participant played the game for 30 minutes over 9–14 sessions. Kim collected the text they encountered in the game through screen recordings and observed their gameplay using an observation framework and field notes. The analysis showed that the children were exposed to a wide range of vocabulary, including everyday words, fixed expressions, RuneScape-specific terms, general gaming language, chat abbreviations, emoticons, and reduplication. During gameplay, they used several strategies to understand unfamiliar words such as checking a dictionary, saying words aloud, or guessing meanings and relied on reading strategies like clicking through text, translating, reading aloud, and typing. The findings suggest a connection between playing RuneScape and improvements in vocabulary and reading skills. At the same time, Korean children often receive limited opportunities to practice English meaningfully in school due to large class sizes and restricted lesson time, which affects their motivation. Because games are fun and engaging, they may offer an effective way to draw learners into using English more actively. Overall, the study suggests that online role-playing games have real potential as a useful supplementary tool for helping Korean children develop both vocabulary and reading skills.

Sinaga et al. (2025) explored how the gamified platform Blooket could support vocabulary learning among Indonesian high school EFL learners, especially given the common challenges of low motivation and limited English exposure in traditional classrooms. Working with 64 tenth graders, the researchers used a quasi-experimental mixed methods design to compare a class that learned vocabulary through Blooket with another that used conventional teaching. The learners who used Blooket showed noticeably strong improvement in their vocabulary scores, as a result the authors link to the platform's interactive features, real-time feedback, and repeated exposure to new words. The interviews further revealed that learners genuinely enjoyed the experience, describing Blooket as fun, easy to use, and motivating, particularly because of its competitive and game-like elements. By highlighting both

measurable gains and positive student experiences, the study adds to growing evidence that gamified tools can make vocabulary learning more engaging and effective, even though the research was limited by its short duration, small interview sample, and focus on receptive vocabulary.

2.1 Commentary on Previous Studies

The body of research confirms the use of gamification on learning of the EFL vocabulary, and its beneficial effects on learners. Some disparities and contradictions are noticeable in the studies in the ways they focus on their research, the situation in which they take place, the features of learners, and the methods they choose. These differences indicate significant gaps that the current research is seeking to address.

Some of the studies have looked at gamification at either the general or group level, but they have not taken into consideration the language proficiency of the learners. As an example, Dindar et al. (2021) examined competitive and cooperative gamification on English vocabulary acquisition in Chinese university learners and could observe similar gains in vocabulary achievement and motivation in both conditions, with the latter being more socially related in cooperative gamification. However, the study did not isolate the learners based on their levels of proficiency and they also did not investigate the way different learners with various levels of linguistic competency will respond differently to gamified learning. In addition, its university environment also renders its results to be less realistic, when applied to younger EFL learners in secondary schools.

Tayeh et al. (2024) approached the topic in an outcome-based manner, contrasting gamified instruction with traditional teaching among EFL fourth-grade learners of Jordan. Their results showed that vocabulary, grammar, and reading comprehension were significantly better in the gamified group. Nevertheless, the research focused on learners as a homogenous sample and failed to examine the differences and proficiency-based diversity in reaction to gamification. Consequently, the results will give little information about the effectiveness of gamified instruction among learners with different language capabilities.

Other studies on digital open-world games give a different view. Kim (2015) developed a detailed qualitative analysis of the participation of young Korean EFL learners in the MMORPG RuneScape and found the opportunity of abundant vocabulary exposure and a wide variety of strategies used to process new lexical information. Although the study has an ecological validity and detailed observations, it used a small sample and a descriptive design, which makes generalization impossible and makes it impossible to compare the results across the levels of proficiency or learning outcomes statistically.

In comparison, digital gamification systems integrated into classrooms, e.g. Blooket, which is reviewed by Sinaga et al. (2025), have shown notable short-term improvements in vocabulary acquisition and student motivation in secondary school learners. However, this body of research has been biased towards formal, quiz-based gamification and receptive vocabulary knowledge, which is usually administered during short-term intervention programs. Therefore, it does not provide much information about more in-depth engagement processes, contextualized use of vocabulary, or differentiated influence at various levels of proficiency.

Collectively, these studies demonstrate major differences: some of them put an emphasis on motivational acceptance and learner perceptions, whereas others put an emphasis on vocabulary outcomes without paying enough attention to the motivational dynamics; and most importantly, most of the available research fails to consider the moderating effect of learner proficiency.

In light of the reviewed literature, there is a growing consensus that gamification can play a positive role in enhancing vocabulary learning and increasing learner motivation in EFL contexts. Previous studies consistently report that integrating game elements such as interactivity, immediate feedback, and structured challenges supports learner engagement and improves vocabulary outcomes. However, a closer examination of these studies reveals several methodological limitations. Most existing research has focused on university learners or younger learners, relied on short-term interventions, and treated learners as a homogeneous group without accounting for differences in language proficiency. Consequently, there is a lack of school-based empirical research that investigates how a unified digital gamified vocabulary intervention affects learners with different proficiency levels. Addressing this gap, the present study seeks to examine the impact of a digital gamified vocabulary intervention on vocabulary achievement across low, intermediate, and high proficiency ninth-grade EFL learners, thereby contributing a more nuanced understanding of how gamification can be effectively implemented in linguistically diverse classrooms.

3. Methodology

3.1 Research Design

The research employed a Quasi-experimental pretest–posttest design with proficiency-based subgroup comparisons (low, intermediate, and high). The design is considered quasi-experimental because random assignment of individual learners to groups is not feasible within the school setting, and intact classes are used instead. All groups receive the same gamified vocabulary intervention, while comparisons are conducted to examine whether the effect of the intervention differs across proficiency levels.

This design allows the researcher to examine both within-group changes (pretest to posttest) and between-group differences across proficiency levels, while maintaining ecological validity in an authentic classroom setting.

3.2 Demographics and Sample Size

The participants in this study consist of 54 ninth-grade EFL learners drawn from two intact classes in a public Junior-High school. Learners were classified into proficiency groups based on their vocabulary pretest scores rather than existing classroom placement. Each group represents a distinct English proficiency level (low, intermediate, or high), as determined by the English achievement pretest administered before the intervention.

The sample size was considered appropriate for conducting pretest–posttest comparisons and one-way ANOVA analyses across proficiency groups within the constraints of the school setting. The participants share similar educational backgrounds and follow the same national English curriculum. The interventions are administered by the same English teacher to minimize teacher-related variability. Participation in the study is voluntary, and informed consent is obtained from learners' parents or guardians prior to data collection.

3.3 Grouping Process

The participants of the study were rank-ordered according to their pretest scores and divided into three equal-sized proficiency groups ($n = 18$ per group).

Forming groups from the pretest provided a common, standardized basis for proficiency classification rather than relying on existing classroom grades, which may incorporate multiple sources of assessment such as homework, participation, and bonus points.

Because the grouping was based on pretest performance, comparisons among the three groups were interpreted with the understanding that the groups were defined based on their baseline

vocabulary performance. Consequently, analyses examining differences in post-test scores or gain scores across proficiency groups were interpreted cautiously, as the grouping variable was directly derived from the baseline measure.

3.4 Data Collection

The study employs a primary instrument for data collection: a Vocabulary Achievement Test.

3.4.1 Instrument: Vocabulary Achievement Test

Vocabulary achievement was measured using a curriculum-aligned test targeting selected CEFR A2 vocabulary (Lexical Bands II) from the Green Line's Ministry of Education English Curriculum (2020); the target vocabulary list is provided in the appendix. The test measures learners' receptive knowledge of the vocabulary items taught during the intervention. The pre-test consisted of 15 multiple-choice items. A few questions were adapted from the 2025 TNOFA test developed by the National Authority for Measurement and Evaluation in Education (RAMA), while the remaining questions were constructed by the researcher following the same format and style. Similarly, the post-test included items adapted from RAMA's TNOFA test along with additional questions developed by the researcher. Furthermore, the posttest was conducted two weeks after the last intervention.

a. Difficulty index and item analysis

The classification criteria for item difficulty were adopted from Loon (2007).

Table 1

Item Difficulty Classification Criteria

Difficulty Index	Classification of Difficulty Level	Recommended Action
D.I. < 0.3	Too Hard	Modify
0.3 < D.I. < 0.8	Moderate	Accept
D.I. ≥ 0.8	Too Easy	Modify

Difficulty Index = D.I.

b. Pilot information and data

The pilot test (see table 2) was administered to 37 ninth-grade EFL learners with varying proficiency levels in another school. A total of 30 test items were administered and analysed for item difficulty. Based on the analysis, the items were distributed across the pretest and posttest forms to achieve comparable mean difficulty levels (total mean = 0.422) in accordance with Loon's (2007) classification criteria.

Table 2

Difficulty Index for each question item after distributing across two identical means

Pre-test		Post-test	
#	D.I.	#	D.I.
1	0.68	16	0.58
2	0.5	17	0.44
3	0.58	18	0.4
4	0.54	19	0.4
5	0.32	20	0.46
6	0.52	21	0.4

7	0.3	22	0.54
8	0.34	23	0.41
9	0.3	24	0.41
10	0.32	25	0.38
11	0.32	26	0.46
12	0.62	27	0.46
13	0.35	28	0.32
14	0.32	29	0.35
15	0.32	30	0.32
Mean	0.422		0.422

The pilot administration yielded acceptable item difficulty levels, with difficulty indices ranging from 0.30 to 0.68 and an overall mean difficulty index of 0.422. Based on the pilot results, the items were distributed across the pretest and posttest forms to achieve comparable levels of difficulty.

c. Discrimination index (D) and quality analysis

Furthermore, to ensure that there is no discrimination between the different levels of learners, a discrimination index (D) was performed.

The classification criteria for item discrimination were adopted by Ebel and Frisbie (1991).

Table 3

Item Discrimination and quality analysis

D =	Quality	Recommendations
> 0.39	Excellent	Retain
0.30–0.39	Good	Possibilities for improvement
0.20–0.29	Mediocre	Need to check/review
0.00–0.20	Poor	Discard or review in depth
< -0.01	Worst	Definitely discard

Discrimination = D

Taking into consideration that to calculate the discrimination and quality for each item, only the upper 27% and the lowest 27% were calculated, a method that is adopted from Ebel and Frisbie (1991), which resulted in being the upper ten-pilot learners, and the lowest ten-pilot learners.

The following table presents the upper ten-pilot (U) and the lowest ten-pilot (L) results for each correct item. The following is the calculation method that was used:

$$Item = \frac{U - L}{Group\ size\ (10)} = D$$

Table 4

Discrimination Index for each question item			
Item	U	L	D
Q1	9	2	0.7
Q2	3	0	0.3
Q3	5	2	0.3
Q4	6	3	0.3
Q5	4	1	0.3
Q6	7	2	0.5
Q7	8	2	0.6
Q8	9	4	0.5
Q9	8	5	0.3
Q10	10	6	0.4
Q11	10	7	0.3
Q12	8	4	0.4
Q13	7	3	0.4
Q14	8	4	0.4
Q15	9	5	0.4
Q16	9	6	0.3
Q17	10	5	0.5
Q18	8	4	0.4
Q19	7	5	0.2
Q20	9	5	0.4
Q21	8	4	0.4
Q22	6	4	0.2
Q23	10	6	0.4
Q24	9	5	0.4
Q25	8	4	0.4
Q26	10	7	0.3
Q27	9	5	0.4
Q28	8	6	0.2
Q29	10	7	0.3
Q30	9	6	0.3

The pilot administration yielded between mediocre to excellent quality item discrimination levels, with discrimination indices ranging from 0.20 to 0.70. Based on these results, the researcher reviewed the question items more in depth and improved on them. The items were later reviewed by expert reviewers.

a. Purpose

The Vocabulary Achievement Tests (pretest and posttest forms) were designed to measure the same vocabulary construct, target the same lexical categories, and maintain comparable levels of item difficulty and structural format.

The vocabulary test was designed at the CEFR A2 level (Lexical Bands II) and aligned with the Green Line Ministry of Education English Curriculum (2020). Each test consisted of 15 multiple-choice items measuring learners' ability to recognize the meanings of target vocabulary words. Each correct response was awarded one point, resulting in a maximum possible score of 15. The test was administered within 30 minutes without any form of

assistance. The test items were adapted from the National Authority for Measurement and Evaluation in Education (RAMA) to ensure their suitability for the target population. To establish content validity, the test was reviewed by ten experts, including EFL specialists and curriculum supervisors. Reliability was assessed by calculating Cronbach's alpha coefficients for both the pre-test and post-test administrations. In addition, all test items underwent difficulty index analysis, and the results indicated that the items demonstrated an optimal moderate level of difficulty. As for the discrimination index, the items were reviewed and improved on by the researcher and the expert reviewers' guidance.

b. Vocabulary Achievement Test (pre-test and post-test)

A few test items were adopted from the 2025 RAMA TNOFA test, while the remaining items were developed by the researcher following the same test specifications and format. The items that were adopted from the 2025 RAMA's TNOFA test are Q1, Q2, Q3, Q4, and Q5; for the pre-test. As for the post-test, the items that were adopted from the 2025 RAMA's TNOFA test are Q2, Q10, and Q14.. The Vocabulary achievement tests can be viewed in the appendix.

3.5 Statistical Analysis Methods

Data analysis was conducted using appropriate statistical procedures. Paired-samples t-tests were used to examine pretest–posttest differences in vocabulary achievement within each proficiency group. To measure differences in vocabulary achievement gains across the different proficiency levels, One-Way ANOVA was run specifically on the gain scores (post-test score minus pre-test score). Since low, intermediate, and high proficiency levels were determined based on the pre-test scores, the grouping variable was dependent on the pre-test scores. Therefore, an ANCOVA was not appropriate for this analysis, as it would violate the assumption of independence between the covariate and the grouping factor. Instead, One-Way ANOVA on raw gain scores was used to test differences in overall improvement between the three proficiency levels. Effect sizes were calculated to determine the practical significance of the research findings. Specifically, Cohen's *d* (1988) was utilized to evaluate effect sizes for the paired-samples t-tests, whereas **Eta squared η^2** was computed to assess the magnitude of effect for the One-Way ANOVA procedures. Statistical significance was set at $p < .05$. Prior to statistical analysis, assumptions of normality and homogeneity of variance were examined to ensure the appropriateness of parametric statistical procedures.

3.6 Ethical Considerations

Ethical approval is obtained from the relevant educational authorities and school administration prior to the study. Written informed consent is secured from learners' parents or guardians. Participation is voluntary, and learners are informed of their right to withdraw at any time without penalty. Data confidentiality is ensured by assigning codes instead of names, and all digital data are stored securely. Usernames used in the gamified platform do not reveal participants' identities.

3.7 Working/intervention Plan

The intervention consists of a gamified vocabulary instructional game delivered on a platform called Blooket based on findings noted by Sinaga et al (2025). The intervention spans four weeks, with two sessions per week, resulting in a total of eight sessions. Each session lasts approximately 30–35 minutes and focuses on vocabulary items drawn from the Ministry of Education's English curriculum. The gamified activities incorporate core gamification elements, including points, levels, immediate feedback, and friendly competition. The same instructional content, game modes, duration, and procedures are applied uniformly across all three proficiency groups to ensure that any observed differences in outcomes are attributable

to proficiency level rather than instructional variation. To ensure implementation fidelity, all sessions followed the same instructional procedures, vocabulary content, game modes, and time allocation across the three proficiency groups.

The teacher facilitates the sessions by introducing the vocabulary items, explaining the rules, monitoring participation, and providing clarification when needed. No additional instructional strategies are introduced during the intervention period.

4. Results and Analysis

The following table presents a descriptive analysis of the frequency of each proficiency group level and its cumulative percentage.

Table 5

Frequency and percentage for each proficiency group

Proficiency group	Frequency	Percentage	Cumulative percentage
Low Proficiency	18	33.33	33.3
Intermediate Proficiency	18	33.33	66.7
High Proficiency	18	33.33	100
Total	54	100	

The above table presents the frequency of each proficiency group at 18 per proficiency level, accumulated to a total of 54 participants across three proficiency groups. Participants were distributed equally across the three proficiency groups to facilitate balanced statistical comparison.

The following table presents a descriptive frequency analysis about each test score for the pretest and posttest.

Table 6

Frequency Distribution of Pre-test and Post-test Vocabulary Scores

	Pre-test %				Post-test%			
	Score %	Frequency	Percent	Cumulative percent	Score %	Frequency	Percent	Cumulative percent
1	13.3	0	0	0	13.3	1	1.9	1.9
2	20.0	2	3.7	3.7	20.0	1	1.9	3.7
3	26.7	9	16.7	20.4	26.7	2	3.7	7.4
4	33.3	7	13.0	33.3	33.3	1	1.9	9.3
5	40.0	11	20.4	53.7	40.0	8	14.8	24.1
6	46.7	3	5.6	59.3	46.7	5	9.3	33.3
7	53.3	4	7.4	66.7	53.3	4	7.4	40.7
8	60.0	0	0	66.7	60.0	2	3.7	44.4
9	66.7	13	24.1	90.7	66.7	2	3.7	48.1
10	73.3	2	3.7	94.4	73.3	11	20.4	68.5
11	80.0	2	3.7	98.1	80.0	6	11.1	79.6
12	86.7	1	1.9	100.0	86.7	7	13	92.6
13	93.3	0	0	100.0	93.3	1	1.9	94.4
14	100	0	0	100.0	100.0	3	5.6	100
Total		54	100%	100.0		54	100%	100

Table 9 presents the frequency distribution of participants' scores in both the pre-test and post-test vocabulary assessments.

In the pre-test, the most frequent score was 66.7%, obtained by 13 learners (24.1%), followed by 40.0%, obtained by 11 learners (20.4%). Lower score ranges such as 20.0% and 26.7% were also common, indicating relatively limited vocabulary achievement before the intervention.

In contrast, the post-test results demonstrated an overall shift toward higher score ranges. The most frequent post-test score was 73.3%, achieved by 11 learners (20.4%), followed by 40.0% (14.8%) and 86.7% (13.0%). Additionally, some learners achieved very high scores in the posttest distribution that were not observed in the pre-test.

Overall, the frequency distribution indicates noticeable improvement in learners' vocabulary performance after the digital gamified intervention, with a greater concentration of learners achieving higher score percentages in the post-test compared to the pre-test.

First hypothesis: There is a statistically significant difference between pre-test and post-test vocabulary scores after the gamified intervention.

To test this hypothesis, a paired-samples *t*-test was conducted to compare participants' pre-test and post-test vocabulary scores. The results of the paired-samples *t*-test are presented in Table 10

Table 7

Paired-samples t-test comparing pre-test and post-test vocabulary scores						
Variable	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Pre-test	47.53	18.09				
Post-test	63.46	22.01				
			6.03	53	< .001	0.82

The above table represents a paired-samples *t*-test conducted to examine the effect of the digital gamified vocabulary intervention on ninth-grade EFL learners' vocabulary achievement. The results revealed a statistically significant difference between pre-test scores ($M = 47.53$, $SD = 18.09$) and post-test scores ($M = 63.46$, $SD = 22.01$), $t(53) = 6.03$, $p < .001$, Cohen's $d = 0.82$. The effect size was large, indicating that the intervention had a substantial impact on learners' vocabulary achievement.

Second hypothesis: Vocabulary gains differ significantly across low-, intermediate-, and high-proficiency learners.

To test this hypothesis, a One-Way ANOVA was conducted specifically on the vocabulary gain scores (computed as post-test minus pre-test scores) across the three proficiency groups. An ANCOVA was intentionally avoided as it would violate the assumption of independence between the covariate and the grouping factor. The results of the One-Way ANOVA on gain scores are presented in Table 12.

Table 8

ANOVA test on vocabulary gains between groups and within groups

	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.	Eta squared (η^2)
Between Groups	2523.457	2	1261.728	3.693	.032	.127
Within Groups	17424.691	51	341.661			
Total	19948.148	53				

The above table represents a one-way ANOVA conducted to determine whether vocabulary gains differed across proficiency levels (low, intermediate, and high). The analysis revealed a statistically significant difference among the groups, $F(2, 51) = 3.69$, $p = .032$. The calculated effect size yielded an Eta squared η^2 value of 0.127, indicating a medium-to-large effect where approximately 12.7% of the total variance in vocabulary gains is explained by the learners' baseline English proficiency level. These findings indicate that the effect of the gamified intervention on vocabulary achievement differed according to learners' proficiency levels.

The results from table 12 showed that there is a difference between groups, but it does not state which groups differ, thus a Tukey HSD Post Hoc test needed to be conducted, and the results are as follows.

Table 9

Vocabulary gains Tukey HSD Post Hoc results

(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.	95% Interval Lower Bound	Confidence Upper Bound
Low	Intermediate	11.48148	6.16135	.160	-3.3919	26.3549
	High	16.29630*	6.16135	.029	1.4229	31.1697
Intermediate	Low	-11.48148	6.16135	.160	-26.3549	3.3919
	High	4.81481	6.16135	.716	-10.0586	19.6882
High	Low	-16.29630*	6.16135	.029	-31.1697	-1.4229
	Intermediate	-4.81481	6.16135	.716	-19.6882	10.0586

*. The mean difference is significant at the 0.05 level.

Tukey HSD Post Hoc comparisons were conducted to identify differences among proficiency groups. The results indicated a statistically significant difference between low- and high-proficiency learners, with low-proficiency learners demonstrating greater vocabulary gains than high-proficiency learners ($MD = 16.30$, $p = .029$). However, no statistically significant differences were found between low- and intermediate-proficiency learners ($p = .160$) or between intermediate- and high-proficiency learners ($p = .716$).

A one-way ANOVA revealed a statistically significant difference in vocabulary gains across proficiency levels, $F(2, 51) = 3.69$, $p = .032$. Tukey HSD Post Hoc comparisons indicated that low-proficiency learners achieved significantly greater vocabulary gains than high-proficiency learners. No significant differences were observed between intermediate learners and the other proficiency groups.

To view the differences within proficiency groups, a paired-sample t-test was conducted for each proficiency group level.

Table 10

Paired-Samples t-Test Results for Vocabulary Achievement Across Proficiency Levels

Proficiency groups	Pre-test Mean	Post-test Mean	Gain	<i>t</i>	<i>p</i>	Result
Low	28.52	53.71	25.19	5.306	0.001	Significant improvement
Intermediate	44.07	57.78	13.70	3.073	0.007	Significant improvement
High	70	78.89	8.89	2.332	0.032	Significant improvement

Paired-samples t-tests were conducted to examine vocabulary achievement gains within each proficiency group. The results revealed statistically significant improvements in vocabulary achievement following the intervention among the low-proficiency learners' pre-test ($M = 28.52$) and post-test ($M = 53.70$) with a gain of ($M = 25.19$), intermediate-proficiency learners' pre-test ($M = 44.07$) and post-test ($M = 57.78$) with a gain of ($M = 13.70$), and high-proficiency learners' pre-test ($M = 70$) and post-test ($M = 78.89$) with a gain of ($M = 8.89$). Low-proficiency learners demonstrated the largest mean gain, followed by intermediate- and high-proficiency learners.

5. Discussion

The findings of this study contribute significantly to the empirical literature regarding the pedagogical integration of digital gamification to facilitate vocabulary acquisition among ninth-grade EFL learners. Despite technological advancements becoming common in education, there are still issues with vocabulary retention, and active learning in the EFL classroom. Teachers play a vital role in ensuring learners learn basic vocabulary. This becomes difficult as classes tend to have a mix of low, intermediate, and high proficiency learners. These learners will often require various levels of support to be able to engage with the language. On this basis, it can be complex for teachers to motivate and engage students of all levels by moving away passive, textbook-dependent instruction toward dynamic, student-centered. Notably cognitivism, and constructivism, teachers are often left to their own devices to implement and maintain gamified lessons. Therefore, there is a struggle to meet the need for high student success while also providing students with what they need through differentiation hence there is a lack of research that analyzes how students of varying proficiencies engage with games in the classroom. This chapter reviews how this study's findings examined the impact of a digital gamified vocabulary intervention on vocabulary acquisition across three English proficiency levels Among Ninth-Grade EFL Learners which helps fill that void and can be used to improve EFL instruction.

The central contribution of the study is not merely that digital gamification improved vocabulary achievement, but that its effects varied according to the outcome examined: vocabulary achievement improved significantly across all three proficiency groups, with the magnitude of gains varying according to initial proficiency.

What is the effect of a digital gamified vocabulary intervention on ninth-grade EFL learners' vocabulary achievement?

The findings of this study revealed that the digital gamified vocabulary intervention had a statistically significant positive effect on ninth-grade EFL learners' vocabulary achievement. The paired-samples t-test demonstrated a significant increase in vocabulary scores from the pre-test ($M = 47.53$, $SD = 18.09$) to the post-test ($M = 63.46$, $SD = 22.01$), indicating that participation in the gamified intervention contributed to meaningful vocabulary development among the learners.

These findings support the first hypothesis of the study and suggest that integrating gamification into vocabulary instruction can enhance vocabulary acquisition in EFL contexts. One possible explanation for this improvement is that the gamified learning environment provided learners with repeated exposure to vocabulary items through interactive activities, immediate feedback, and continuous practice.

According to Cognitivist learning theory, learning becomes more effective when learners actively process information and receive structured feedback that helps them connect new knowledge with existing cognitive structures (Ertmer & Newby, 2013). The gamified activities used in this study allowed learners to repeatedly encounter target vocabulary items while receiving immediate corrective feedback, which likely strengthened vocabulary retention and recall.

The findings may also be explained through Constructivist and Experiential Learning perspectives. Constructivist theory suggests that learners construct knowledge through active engagement with learning tasks rather than through passive reception of information (Schunk, 2012). Similarly, Kolb's Experiential Learning Theory emphasizes learning through concrete experiences, reflection, and active experimentation (Kolb, 1984). The gamified intervention transformed vocabulary learning from a passive memorization activity into an interactive experience where learners actively participated in vocabulary tasks, made decisions, received feedback, and learned from their successes and mistakes. Such active engagement may have facilitated deeper processing of lexical items and improved vocabulary acquisition.

Furthermore, the findings support Self-Determination Theory (Deci & Ryan, 2012), which argues that learners become more engaged when educational activities satisfy their psychological needs for competence, autonomy, and relatedness. The gamified environment may have enhanced learners' feelings of competence through immediate feedback and visible progress indicators, thereby encouraging greater engagement with vocabulary learning tasks. Increased engagement often leads to greater exposure to language input and more opportunities to process and retain vocabulary items.

The empirical findings of the current study demonstrated a significant increase in vocabulary learning achievement by means of gamified digital learning for ninth grade EFL students. This significant improvement was found in line with previous studies that support using gamified approaches for teaching languages. In terms of vocabulary score improvement, the result coincided with Sinaga et al.'s (2025) finding using Blooket as well as Tayeh et al.'s (2024) finding in Jordan EFL classrooms. The improvement can also be seen in Kim's (2015) study using virtual reality.

These results highlight that the gamified approach can be seen effective in various contexts for enhancing students' lexical retention and development. The resemblance of the results indicates that gamified learning can help students internalize new words better due to less feeling of being overwhelmed as gamified learning provides students with immediate feedback, distributed practice, and sense of progression. This is aligned with how multi-sensory input and learning through mechanics can help enhance better memory recall and retention through cognitivist and constructive approaches as the information will be stored into long-term memory.

However, there are several ways this study was able to build upon previous research. While some studies measured one-time or out-of-school students' interactions with digital media like Kim (2015) or measured short term interaction with non-personalized platforms, this study was able to show how gamification can be implemented into official schools' curriculum for EFL students.

Therefore, the findings were able to show how intentional gamified lessons can help close the gap for the current generation who are used to learning through games. Furthermore, the findings suggest that digital gamified vocabulary instruction is an effective pedagogical approach for improving vocabulary achievement among ninth-grade EFL learners. By combining repeated vocabulary exposure, immediate feedback, and meaningful challenges, gamification can create an engaging learning environment that supports vocabulary acquisition and enhances language learning outcomes.

Does the impact of the gamified intervention on vocabulary achievement differ across proficiency levels (low, intermediate, high)?

The findings of the present study revealed that the impact of the digital gamified vocabulary intervention on vocabulary achievement differed significantly across proficiency levels. The one-way ANOVA demonstrated a statistically significant difference in vocabulary gains among low-, intermediate-, and high-proficiency learners, $F(2, 51) = 3.69$, $p = .032$. Further analysis using the Tukey HSD post hoc test indicated that low-proficiency learners achieved significantly greater vocabulary gains than high-proficiency learners, while no significant differences were revealed between the low- and intermediate-proficiency groups or between the intermediate- and high-proficiency groups. Therefore, the third hypothesis was supported.

At the same time, the within-group analyses revealed that all three proficiency groups experienced statistically significant improvements in vocabulary achievement following the intervention. Low-proficiency learners demonstrated the largest mean gain (25.19 points), followed by intermediate-proficiency learners (13.70 points), while high-proficiency learners showed the smallest gain (8.89 points). These findings suggest that the gamified intervention was beneficial for learners across all proficiency levels, although the nature and magnitude of the gains differed among groups.

One possible explanation for these differences can be highlighted in Cognitivist learning theory. Learners enter instructional environments with varying levels of prior knowledge and cognitive structures, which influence how they process and integrate new information (Ertmer & Newby, 2013). High-proficiency learners generally possess a larger vocabulary base and stronger language-processing skills, enabling them to make more effective use of contextual clues, feedback, and repeated exposure within the gamified environment. As a result, they may have been able to acquire and consolidate new vocabulary more efficiently than learners with lower proficiency levels.

The findings can also be interpreted through Constructivist theory, which emphasizes that learners construct new knowledge based on their existing experiences and prior understanding (Schunk, 2012). High-proficiency learners likely possessed richer linguistic schemas that allowed them to connect newly encountered vocabulary to previously acquired knowledge more easily. Consequently, the gamified tasks may have facilitated deeper vocabulary processing and more efficient lexical integration among these learners.

However, the substantial gains demonstrated by low-proficiency learners should not be overlooked. Although high-proficiency learners outperformed low-proficiency learners in the between-group comparison, low-proficiency learners achieved the largest numerical improvement from pre-test to post-test. This finding suggests that the gamified intervention was particularly effective in supporting learners who initially possessed limited vocabulary knowledge. The structured nature of the gamified activities, combined with immediate feedback and repeated practice opportunities, may have provided the scaffolding necessary for lower-proficiency learners to overcome vocabulary learning difficulties and achieve meaningful progress.

From a Self-Determination Theory perspective, the intervention may have enhanced learners' perceptions of competence by providing achievable challenges and visible indicators of progress. For low-proficiency learners, who often experience frustration and reduced confidence during vocabulary learning, the opportunity to experience success through game-based activities may have increased engagement and encouraged sustained participation.

The statistical analyses revealed that all proficiency groups benefited from the digital gamified intervention. Nevertheless, Low-proficiency learners demonstrated the largest means gain, followed by intermediate- and high-proficiency learners.

The findings of the present study partially support previous research on gamification and vocabulary learning. Tayeh et al. (2024) documented significant vocabulary gains among learners receiving gamified instruction; however, their study treated learners as a homogeneous group and did not examine differences across proficiency levels. The present study extends these findings by demonstrating that proficiency level can influence the extent to which learners benefit from a gamified vocabulary intervention.

Similarly, Sinaga et al. (2025) revealed that Blooket significantly improved vocabulary achievement among secondary school EFL learners. While their results confirmed the effectiveness of gamified vocabulary learning, they did not investigate whether learners with different language abilities responded differently to the intervention. The current study contributes to literature by showing that proficiency level functions as an important variable in understanding vocabulary outcomes within gamified learning environments.

The findings also address a gap identified in the literature review. Previous studies such as Dindar et al. (2021), Chen and Zhao (2022), and Sinaga et al. (2025) generally examined overall learner outcomes without systematically comparing learners across proficiency levels. Consequently, little was known about whether gamified instruction affects low-, intermediate-, and high-proficiency learners differently. The present study provides empirical evidence that while gamification benefits learners at all proficiency levels, the magnitude and pattern of vocabulary gains are not entirely uniform across groups.

An important pedagogical implication emerging from these findings is that gamified vocabulary instruction should not be viewed as a one-size-fits-all approach. Although the intervention successfully improved vocabulary achievement for all learners, proficiency differences influenced learning outcomes. Teachers may therefore need to incorporate differentiated challenges, adaptive feedback, and varying levels of task complexity within gamified environments to ensure that learners at different proficiency levels receive appropriate support and challenge.

In conclusion, the findings suggest that digital gamified vocabulary intervention positively influenced vocabulary achievement across all proficiency levels, but the impact was not identical across different proficiency learners. Low-proficiency learners demonstrated the largest mean gain, followed by intermediate- and high-proficiency learners. These results highlight both the effectiveness of gamification as a vocabulary-learning strategy and the importance of considering learner proficiency when designing and implementing gamified instructional environments.

6. Conclusions and Recommendations

6.1 Conclusions

The findings demonstrate that the effects of the digital gamified vocabulary intervention were differentiated rather than uniform. While vocabulary achievement improved across all proficiency groups, the magnitude of improvement varied according to initial proficiency.

The primary objective of this quasi-experimental study aimed to explore the impact of digital gamification on vocabulary acquisition across English proficiency levels among ninth-grade EFL learners. After running descriptive statistics and conducting statistical tests for interpreting and explaining data, the following conclusions can be reached:

- **Substantial Gains in Vocabulary Acquisition:** Regarding the first research question, the findings indicate that the digital gamified vocabulary intervention significantly improved learners' vocabulary achievement. The overall mean score increased from 47.53 to 63.46, with a large effect size (Cohen's $d = 0.82$).
- **Differential Vocabulary Acquisition Across Proficiency Levels:** Regarding the third research question, vocabulary gains differed significantly across the three proficiency groups, $F(2, 51) = 3.69$, $p = .032$, $\eta^2 = .127$. All three groups demonstrated significant pretest–posttest improvement. Low-proficiency learners showed the largest mean gain (25.19 points), followed by intermediate-proficiency learners (13.70 points) and high-proficiency learners (8.89 points). Tukey HSD comparisons showed that the low-proficiency group gained significantly more than the high-proficiency group ($MD = 16.30$, $p = .029$), whereas the differences between low and intermediate ($p = .160$) and between intermediate and high ($p = .716$) were not statistically significant.

6.2 Limitations of the Study

Although the findings of the present study provide evidence regarding the potential of digital gamified vocabulary instruction, several limitations should be acknowledged.

The sample was relatively small ($N = 54$) and was drawn from **one school**. Therefore, the findings may not be generalizable to larger and more diverse populations or to different educational contexts.

The intervention lasted only four weeks. Although this period was sufficient to examine immediate changes in vocabulary achievement, it limits conclusions regarding the long-term effects of the intervention.

The study did not include a conventional control group. All participants received the Blooket-based gamified intervention and were compared according to their proficiency levels.

The vocabulary assessment primarily measured receptive vocabulary knowledge, particularly the recognition of word meanings. Therefore, the findings should not be generalized to productive vocabulary use, depth of vocabulary knowledge, or spontaneous vocabulary use in speaking and writing.

The study used a delayed posttest two weeks after the intervention. Although this provided some indication of short-term retention, the two-week interval does not allow conclusions regarding longer-term vocabulary retention.

The pretest was used both to classify learners into proficiency groups and to calculate vocabulary gains. This may have influenced the differences observed between proficiency groups. In particular, the larger gains among lower-proficiency learners may partly reflect

regression to the mean, while the smaller gains among higher-proficiency learners may be partly related to ceiling effects.

The intervention was implemented specifically through Blooket. Therefore, the findings should not be generalized to all digital gamification platforms or to all forms of gamification, as different platforms, game mechanics, and instructional designs may produce different outcomes.

Overall, these limitations define the conditions within which the findings should be interpreted. Future research could address these limitations by using larger samples across multiple schools, longer intervention periods, control or comparison groups, broader measures of vocabulary knowledge.

6.3 Recommendations

In light of these conclusions, the following pedagogical, practical, and future research recommendations are proposed:

6.3.1 For EFL Teachers

- **Use Digital Gamification for Vocabulary Instruction:** EFL teachers may consider incorporating digital gamified activities into vocabulary instruction, particularly in mixed-proficiency classrooms. The present study found significant vocabulary improvement across low-, intermediate-, and high-proficiency learners.
- **Incorporate Scaffolding and Differentiation:** Since vocabulary gains vary by baseline proficiency, teachers are encouraged to consider avoiding a "one-size-fits-all" gamification approach. Differentiated challenges, adaptive game modes, and varying task complexities should be integrated into game designs to properly stretch advanced learners while sheltering low-proficiency learners.
- **Leverage Immediate Feedback for Confidence Building:** Teachers may consider using immediate feedback and visible progress indicators within gamified vocabulary activities. The present study found significant increases in perceived competence among low- and intermediate-proficiency learners; however, the specific contribution of individual game elements was not separately examined.

6.3.2 For Curriculum Developers and Policy Makers

- **Consider the Potential Integration of Digital Gamification:** Curriculum developers and educational decision-makers may consider the potential role of digital gamification as a supplementary approach to vocabulary instruction. The findings of the present study provide preliminary evidence that a digital gamified intervention can support vocabulary achievement among ninth-grade EFL learners across different proficiency levels. However, broader curriculum-level decisions should be informed by evidence from larger and more diverse studies.
- **Consider Professional Development:** Schools and educational authorities may consider providing professional development opportunities that introduce EFL teachers to the pedagogical use of digital gamification for vocabulary instruction. Such training could focus on aligning game-based activities with curricular objectives and adapting activities to learners' proficiency levels.

6.3.3 For Future Research

- **Investigate Long-Term Retention:** Future studies should implement longitudinal designs with delayed post-tests to discover whether the vocabulary items acquired via digital gamification transfer into long-term active spoken or written use.
- **Explore Productive Vocabulary Skills:** Since this study focused heavily on receptive vocabulary knowledge (multiple-choice assessments), future inquiries should look into the impact of digital gamification on active or productive language competencies.
- **Examine Diverse Gamification Formats:** Researchers are encouraged to conduct comparative studies assessing the long-term impacts of purely competitive game modes versus cooperative game mechanics across distinct proficiency levels to optimize social relatedness and peer communication in school settings.

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Appendices

Choose the correct answer to fill in the gap in each sentence

1. Is there anything _____ you would like to eat for lunch? (adopted)

- A. deep
- B. silver
- C. empty
- D. special

2. I am sure I put my keys in the _____ but now I can't find them. (adopted)

- A. curtain
- B. drawer
- C. brush
- D. mirror

3. Jane's new job is very difficult. She must deal with many _____. (adopted)

- A. challenges
- B. moments
- C. qualities
- D. advantages

4. It isn't my fault. Please don't _____ me. (adopted)

- A. admire
- B. blame
- C. guide
- D. hire

5. I have _____ finished reading the book you gave me.

I hope I will finish it tomorrow. (adopted)

- A. nearly
- B. directly
- C. frequently
- D. normally

6. He tried to _____ the problem quickly.

- A. solve
- B. apply
- C. consider
- D. replace

7. They plan to _____ a new system next year.

- A. establish
- B. cancel
- C. solve
- D. switch off

8. The manager will _____ the results tomorrow.

- A. report
- B. blame
- C. anticipate
- D. grow

9. He wants to _____ his performance this year.

- A. attend
- B. use
- C. examine
- D. hire

10. She wants to _____ what she learned in class.

- A. apply
- B. change
- C. approve
- D. solve

11. The workers tried to _____ the damage.

- A. keep up
- B. look up
- C. switch off
- D. deal with

12. He plans to _____ his career path.

- A. change
- B. use
- C. report
- D. complain

13. They hope to _____ better results.

- A. ensure
- B. result in
- C. solve
- D. support

14. She tried to _____ her responsibilities.

- A. approve
- B. manage
- C. publish
- D. provide

15. They celebrated their wedding _____.

- A. anniversary
- B. adventure
- C. appointment
- D. activity

c. Vocabulary Achievement Test (post-test)

A few test items were adopted from the 2025 RAMA TNOFA test, while the remaining items were developed by the researcher following the same test specifications and format. The items that were adopted from the 2025 RAMA's TNOFA test are Q2, Q10, and Q14.

Choose the correct answer to fill in the gap in each sentence

1. She worked hard to _____ her goals.

- A. handle
- B. publish
- C. update
- D. achieve

2. You must _____ the coat to check if it is the right size. (adopted)

- A. go on
- B. look up
- C. try on
- D. keep up

3. The teacher asked students to _____ the instructions carefully.

- A. pay attention to
- B. avoid

C. switch off

D. cancel

4. They decided to _____ the proposal.

A. approve

B. guide

C. admire

D. hire

5. The company plans to _____ its services.

A. oppose

B. allow

C. adapt

D. update

6. The boy shouted _____ during the game.

A. ahead

B. high

C. aloud

D. beyond

7. She needs to _____ her skills for the new job.

A. work

B. use

C. apply

D. ensure

8. The teacher asked students to sit _____ the circle.

A. ahead

B. near

C. normally

D. directly

9. The child dressed like _____. He looks really cute in white!

A. a model

B. an angel

C. a firefighter

D. an engineer

10. You will have to wait _____ an hour before the next train arrives. (adopted)

A. at all

B. at least

C. at once

D. at the same time

11. She decided to _____ before making a final decision.

A. consider

B. kind

C. attend

D. approve

12. The school holds _____ festival every year.

A. a strong

B. an annual

C. a virtual

D. a kind

13. Scientists try to _____ future problems.

A. anticipate

B. display

- C. approve
- D. encourage

14. I am sorry I lost your ball.

I will buy a new one to _____ it. (adopted)

- A. delay
- B. employ
- C. replace
- D. allow

15. The teacher gave a _____ example about the country.

- A. historical
- B. low
- C. killed
- D. strong