Using gamification in EFL vocabulary learning and learners' attitudes toward gamification use

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Abstract

Although gamification is one of the latest education trends, it has not been investigated adequately in the Egyptian EFL context. Hence, this mixed-method study aimed to explore the effect of using gamification on Egyptian EFL learners' vocabulary knowledge and their attitudes toward gamification use. The study followed a pre-posttest quasi-experimental research design. A total of 68 English Majors in the Faculty of Education at New Valley University participated in this study. The instruments included a vocabulary test (APTIS), an attitude questionnaire (designed by the researcher), learning logs and follow-up interviews. The experimental group used Quizizz, whereas the control group used paper-based sheets. After a seven-week treatment period, the participants were post-tested. The results showed significantly increased vocabulary knowledge of the experimental group in the APTIS test compared to the control group. The effect size of the treatment was remarkable (Cohen's d = 1.8). The questionnaire and interview data indicated positive attitudes toward the use of gamification in learning vocabulary. The interviewees found gamification more exciting and enjoyable than traditional learning methods. However, they experienced some challenges in internet access. In this study, gamification was deemed effective in enhancing EFL learners' vocabulary knowledge. Gamification efficiency may be due to its challenging and motivating nature in adding inspiring gaming elements to traditional learning. This study recommends the use of gamification as a useful and motivating tool for enhancing lexicon competence.

Keywords: Gamification, EFL vocabulary learning, Vocabulary Knowledge and attitudes toward gamification.

Introduction

The last decades have witnessed a radical digital movement and the emergence of innovative educational strategies. The 21st century educational system integrated e-learning with various applications and platforms to enhance communication, autonomy, cooperation and critical thinking. According to Dani (2019), gamification, as distinguished from other education technology trends, surely boosts participation, engagement, and competition. Today's learners are 'digital natives' (Prensky, 2001); ubiquitous technology is their communication means and gamification has become an indispensable part of their daily life. Consequently, various

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gamification applications have recently been incorporated to facilitate e-learning and cope with 'generation Z characteristics' (Combe, 2015).

In an instructional setting, gamification is defined as "using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems" (Kapp, 2012, p. 10). Examples of gamification elements include, for instance, leaderboards, trophies, and badges. Thus, gamification is based on providing educational content via a motivating and stimulating environment. It is used in the flipped classroom to support students' learning motivation and learning outcomes (Huang & Hew, 2018). Further, gamification enhances students' engagement and performance (Bawa, 2019).

According to Dehghanzadeh et al. (2019, p. 12), gamification for learning English in second language settings "is relatively a new field of research." They also concluded that the literature suggests that gamification for second language learning can support content language learning, engagement, motivation and satisfaction. Yanes and Bououd (2019) argue that gamification seems to have some worthy strength points that foster different language skills. Sun and Hsieh (2018) suggest integrating gamification with classroom teaching to make English classes more exciting and attractive to learners.

Gamification is a promising trend in teaching vocabulary as it promotes motivation (Calvo-Ferrer, 2017) and brings positive outcomes on word retention and vocabulary acquisition (Zou, Huang, & Xie, 2019). As vocabulary is a crucial part of language proficiency, gamification has been applied as a tool for intentional vocabulary learning and motivating language learners. Different gains are associated with using gamification in vocabulary learning and promoting enhanced learners' vocabulary performance in the target language (Zou & Huang, 2016).

A few gamification studies exist in the Egyptian setting, but they focus on subjects rather than English, such as teaching science (Abuzeid, 2019) and teaching mathematics (Abdel Samad, 2018). To contribute, this study seeks to use gamification and examine its effect on vocabulary knowledge among EFL Egyptian English majors students.

Literature Review

Vocabulary Learning

Vocabulary is an integral constituent of language acquisition as it is a cornerstone for all language main and sub-skills. It facilitates understanding of reading or listening inputs. Further, vocabulary is a vital factor in communication. Richards & Rodgers (2001, p. 132) stated that "the building blocks of language learning and communication are not grammar, function, notions,….but lexis, that is, word and word combinations". By the same token, Lewis (1993, p.89) mentioned that "lexis is the core or heart of language." Further, language learners "carry around dictionaries and not grammar books" (Schmitt (2010, p.4). Thus learners appreciate the importance of vocabulary in learning English.

Recent years have witnessed an extensive focus on vocabulary as a central part of L1 and L2 proficiency (Dallar and Xue, 2009; Daller, van Hout and Treffers-Daller, 2003; Read, 2000). Further, different studies explained the relationship between vocabulary knowledge and language competence. For example, Karakoç and Köse (2017) found that vocabulary knowledge significantly contributes to the foreign language performances of reading, writing and proficiency. Other studies showed a strong relationship between vocabulary knowledge and reading comprehension (Nation, 2001; Qian, 2002; Zhang, 2012). Further, vocabulary is also related to success at university (Dallar and Xue, 2009). Such studies show how vocabulary is an indispensable component of language proficiency and academic success.

Nevertheless, language learners are faced with vocabulary challenges as they need to learn a considerable number of English words, which makes it a "formidable task" (Schmitt, 2007, 827) and boring (Nguyen & Khuat, 2003), especially for today's digital students (Yip & Kwan, 2006). Consequently, appropriate motivation tools are needed to alleviate this problem. Recently, the integration of CALL's various applications and platforms in teaching vocabulary has a positive motivational, engaging and academic impact (Zhang & Zou, 2020). Gamification applications have been on the fore in foreign language learning (Dehghanzadeh et al., 2019) and vocabulary learning, in particular (Zou & Huang, 2019). Gamification is a promising trend in learning vocabulary. The next section explains gamification, followed by studies that used gamification to develop vocabulary learning.

Gamification in Education

The use of games in education is not new. It is essential to differentiate between related terms as games and gamification. According to Sailer, Hense, Mandl and Klevers (2013, p. 29), games usually refer to situational components, namely "a goal, which has to be achieved; limiting rules which determine how to reach the goal; a feedback system which provides information about progress toward the goal; and the fact that participation is voluntary". Gamification in education can be defined as "the explicit application of game design elements to systems and contents not recognized as games like courses, lessons, and activities" (Reinhardt, 2019, p. 191) in non-gaming contexts such as a classroom.

Typical game elements include points, badges, leaderboards, progress bars, performance graphs, quests, meaningful stories, avatars and profile development. For example, Sailer et al., (2013, pp. 30-31) explain some elements. Points are collected inside the gamification environment. Badges are visible representations of achievements. Leaderboards are lists of all gamers, typically ranked through their success (See Figures 1 and 2). Progress bars offer records of a participant in the direction of a goal. Avatars are visible representations (for instance, a monster) a participant can pick inside gamification. Consequently, an L2 learning activity can be gamified by "integrating various elements, which include points, rewards, badges, … and boards" (Reinhardt, 2019, p. 192), which helps promote motivation and stimulate learning.

A body of research reported various academic gains associated with using gamification, such as better interaction between different levels of students and reducing the

achievement gap for disadvantaged students (Hung, Young & Lin, 2015). Additionally, gamification has emotional effects, such as reducing anxiety. Besides, it also affects internal and external motivation.   Hanson-Smith (2016, p. 231) argued that gamification "encompasses as it does both rewards external to the self (earning points, attaining levels) and internal rewards that enhance enjoyment and self-worth (beating one's own best record, mastering aspects of the game)." Gamification, thus, seems to foster engagement and needs satisfaction in a non-traditional learning environment. In this concern, Xi and Hamari (2019) recognized that gamification social-related features were positively associated with all kinds of need satisfaction.   Finally, the embedded immediate feedback of gamification can be beneficial for enhancing emotional engagement and provide students with more satisfying and exciting learning experiences (Sun & Hsieh, 2018).

Some studies reported both benefits and challenges or weaknesses in using gamification. For example, in Yanes and Bououd (2019), their students reported some negative feelings as frustration, distraction or boredom if they misunderstand the game. Other reported threats included 'amotivation' that might be due to excessive losing or waste of time. Nevertheless, previous researchers suggested that teachers adjust their activities to learners' needs and levels (Matsumoto, 2016). Besides, to decrease weakness and drawbacks, gamification design needs alignment with specific principles. Kapp (2017, p. 361) defined three main universal principles for gamification: Creating and maintaining student engagement, encouraging students to make meaningful and consequential choices within clearly defined rules and a safe environment and providing visible evidence of progress toward mastery to the student. Taking these principles when integrating gamification within language courses may reduce and minimize challenges that might face students.

Gamification Applications

Various gamification applications help set up and manage gamified lessons or quizzes, such as *Quizlet*, *Quizizz*, and *Kahoot!*. Teachers can integrate gamification activities into online learning platforms, namely, Moodle, Edmodo, or Microsoft teams. *Kahoot!* is among the most popular game-based platforms. Wang and Tahir (2020) stated that it could be a formative assessment and knowledge review tool. They concluded that *Kahoot!* could positively affect learning performance, classroom dynamics, students' and teachers' attitudes, and students' anxiety.

Quizizz is another application used with different language aspects, such as grammar (Rahayu & Purnawarman, 2018) and vocabulary (Permana and Permatawati, 2020). *Quizizz* is used as a formative assessment tool that allows students to review knowledge and learning progress. It enables teachers to assess students' language learning skills and curricular skills (Bury, 2017). It also fosters student participation, motivation and satisfaction (Chaiyo & Nokham, 2017). According to Rahayu & Purnawarman (2018), *Quizizz* has two features of feedback, including the game summary (score and rank) and the performance status (the number of correct and incorrect answers, the number of unattempted questions, average time

per question, and the longest streak). Such features provide useful feedback for students that enable improvement in learning.

Gamification in EFL & Previous Studies on Vocabulary Learning

In language teaching, gamification might be situated within technology-enhanced language learning (TELL), which is defined as "any language learning activity that uses technological means and/or tools for efficiency, motivation, and learning style flexibility" (Zhou & Wei, 2018, p. 472). Gamification is a promising trend and more engaging than non-game context (Nahmod, 2017). Empirical studies showed positive gamification effects on EFL oral proficiency (Girardelli, Barroero & Gu, 2016); grammar (Rahayu & Purnawarman, 2019; Zarzycka-Piskorz, 2016).; learners' intrinsic and extrinsic motivation and interest to learn English (Wu & Huang, 2017; Sun & Hsieh 2018; Medina & Hurtado, 2017). Zhou & Wei (2018, p. 479) suggest that "gamification of learning so frequent in TELL makes it natural to learn vocabulary via computer games".

A plethora of studies examined the use of gamification in vocabulary learning. Permana and Permatawati (2020) recently examined the effect of using *Quizizz* as an assessment tool in German classrooms on vocabulary and structure mastery and students' attitudes toward using *Quizizz* in the classroom. The participants were 61 who used the application. The results showed that using *Quizizz* was useful as a testing tool in learning German. Moreover, students showed a positive response to the use of *Quizizz* in the classroom. Retherford (2020) examined the effects of gamified vocabulary lessons on Spanish speaking ELL students' outcomes. The experimental group played Osmo Words games, whereas the control group used paper-based lessons. The participants were 16 students in the primary school who were equally divided into experimental and control groups. The results showed the efficacy of gamification with increasing vocabulary growth 40% higher than the control participants. Besides, their motivation and engagement increased compared to the control group.

Bal (2018) investigated the relationship between mobile assisted language learning and vocabulary learning. The participants were 60 students at a Turkish university. The tools were an observation over 4 weeks and an achievement test. The experimental group used *Quizizz*, whereas the control group learned vocabulary through traditional paper-based. The results showed that although the experiment group slightly outscored the control group, no significant difference was observed between these two groups' scores.

Moreover, Calvo-Ferrer (2017) investigated the effect of the educational video games *'The Conference Interpreter'* on L2 vocabulary acquisition and perceived learning gains. The participants were 59 students, divided into experimental and control groups. The experimental group used the video game, whereas the control group used a non-gaming tool. Although the results of pre-, post- and delayed tests showed that the experimental group performed statistically better, "the regression model results showed that the actual enjoyment of the game seemed not to affect the students' learning outcomes, neither according to their own estimation nor as determined by testing" (p. 264).

Further, more studies used *Kahoot*! For example, Nahmoud (2017) examined the effects of using *Kahoot!* game-based response system on vocabulary quiz scores. Vocabulary quizzes were administered weekly for over 12 weeks. Participants were 36 general education students and 14 special education students across two 10th grade English classrooms in Monmouth County in the USA. The results showed that vocabulary quiz scores were slightly higher than using the traditional worksheet. Moreover, Pede (2017) investigated the effect of the online game *Kahoot*! on science vocabulary acquisition of students with learning disabilities. The participants were 6 middle school students, 3 males and 3 females. The tools included vocabulary assessments and a student satisfaction survey. Results showed that all students increased their vocabulary assessment scores when *Kahoot!* was played twice weekly. Further, it also increased student focus and on-task behavior. The results also indicated that students enjoyed playing *Kahoot!* and found it easy to be used.

Smith, Li, Drobisz, Park and Kim (2013) compared the effectiveness of computer games (using inferencing) in e-books with hardcopy booklets for vocabulary retention and the relationship between students' performance on computer games vocabulary learning. The participants were 57 intermediate level Chinese students enrolled in a college English course. The tools included students' gameplaying behaviors recorded in the log file and the vocabulary knowledge scale. The study results showed more significant vocabulary learning in the computer game condition (web-based text and computer games) than in the control condition (hardcopy sheets). A significant correlation between students' scores in the games and their vocabulary posttest scores was also found.

As far as ELT is concerned in the Egyptian EFL context, the researcher came across one study (Abu El-Magd, 2017), which mentioned using gamified design but applied it in a face-to-face classroom context. The researcher did not use any digital means in his study but rather board games as 'snake and ladders' or puzzle games. He examined the effectiveness of guided discovery-based gamification in improving grammar learning. The participants were 64 primary grade pupils, divided equally into experimental and control groups. The tools included a grammar test developed by the researcher. The findings revealed that discovery-based gamified tasks improved primary pupils' grammar learning significantly compared to the control group.

The previous gamification studies were administered in different countries such as the USA (Nahmoud, 2019; Retherford, 2020), Indonesia (Permana & Permatawati, 2020), Turkey (Bal, 2018) and China (Smith, Li, Drobisz, Park & Kim, 2013). In the Egyptian setting, however, a few studies exist and they dealt with teaching Arabic reading skills (Hussein & El-Mahlawi, 2019), teaching science (Abuzeid, 2019), teaching mathematics (Abdel Samad, 2018) or teaching technology at the university level (Mahmoud, 2018). The only Egyptian EFL study was Abu El-Magd (2017) and it did not apply online or digital gamification applications to the researcher's best knowledge. To sum up, research regarding gamification in teaching English in the Egyptian context appears to be needed.

The Problem of the Study

The researcher noticed that English first-year students in the English department and Faculty of Education in New Valley University have insufficient vocabulary knowledge. This problem was apparent in the 'writing I' course, where students struggle to write academic paragraphs. They often resort to write in Arabic and then translate their paragraphs into English. Besides, some faculty colleagues confirmed that insufficient vocabulary repertoire is a significant obstacle students usually face in English language learning. In turn, these observations motivated the researcher to investigate the status-quo of their vocabulary knowledge and use in other English courses such as d**rama and poetry. Five staff members were informally interviewed and they also confirmed the low vocabulary level among first-year students. This observation was also highlighted in previous Arabic studies (Afzal, 2019; Elttayef & Hussein, 2017). Consequently, this study seeks to use gamification in vocabulary learning among English majors university students.**

Questions of the Study

1- What is the effect of using gamification on vocabulary knowledge among English majors **university** students?
2- What is the effect of using gamification on the attitudes of English majors toward gamification'?

The hypothesis of the study

There would be a statistically significant difference between the means of scores obtained by students in the experimental and control groups in the post-administration of the Aptis test in favor of the students in the experimental group.

Methodology:

Context and Participants

The participants were 68 students at the English department in the Faculty of Education, New Valley University (the academic year -2020-2021). They have studied English for 12 years. Their age range from 18 -19 years.

Tools of the Study

1- **APTIS Test (vocabulary section)**
APTIS is an English language test developed by British Council experts in language testing. The researcher chose this test as it is used in many countries, and it is also used as a college entrance exam. Hence, it seems to suit the sample of this study. The APTIS vocabulary part has 25 questions (British Council, 2017). It covers 5 question types, and each type includes five items: **Word synonyms**- matching a word to its synonym; **Word definition** - matching a word to its definition; **Word pairs** - matching a word to another word of very similar meaning, **Word usage** - choose a word to be used in the context of a

sentence and **Word combinations** - combine words that are frequently used together (collocations).

Validity and Reliability of the Test

The APTIS test was submitted to a jury of EFL specialists to judge it regarding its content, the number of questions, and the test's suitability for the study sample. To validate the APTIS test, the researcher calculated the correlation coefficient between the test's five main questions and the total test score. The following table shows the results:

Table (1) The correlation coefficients of test questions and the total score of the APTIS

Correlation	Word Synonyms	Word Definition	Word Pairs	Word Usage	Collocations
APTIS Total Score	.471**	.911**	.895**	.884**	.782**
Sig (2-tailed)	.009	.000	.000	.000	.000

Table 1 shows that all the correlation coefficient values with the total score of the APTIS test are high and significant at 0.01. This result indicates the internal consistency of the test and its parts. Besides, the Alpha Cronbach's level was (0.85) which also shows high reliability of the test.

2- **A Questionnaire of Attitudes toward Gamification Use**
The researcher designed a five-point Likert scale: 5 'strongly agree'; 4 'agree'; 3 'neutral'; 2 'disagree'; and 1 'strongly disagree'. The questionnaire consists of 12 items (see Appendix A). It includes 3 aspects: the usefulness of gamification in learning vocabulary, engagement with gamification and overall perception of gamification use.

Validity and Reliability of the questionnaire

To ensure the validity of the attitude questionnaire, the researcher submitted it to a jury. Further, the correlation coefficients between each part's score and the questionnaire's total scores were calculated to validate it. As **Table 2** shows, the third part of the questionnaire has the highest value (.95), followed by the first part (0.94) and finally the second part (0.93). Thus, the three parts have a high and significant correlation at the 0.01 level. This indicates the questionnaire's internal consistency and its three parts, which implies its validity. Further, **Table (2)** shows the calculated alpha scores are high for the three parts, respectively (0.86; 0.79; 0.85). Finally, the reliability for all 12 items was also high, as indicated by the Cronbach's Alpha (0.934)

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Table (**2**) The reliability and internal consistency of the attitudes questionnaire

Parts of the questionnaire	Number of items	Alpha	Pearson Correlation with the total score
1- Benefits of gamification	4	.86	.9٤**
2- Engagement	3	.٧٩	.93**
3- Overall perceptions	5	.٨٥	.٩5**

3- **Interviews**

By the end of the semester, the researcher interviewed 12 volunteer students who agreed to participate. The main questions were: which aspects do you like about gamification? Why? What are the elements that you dislike about gamification? Why? How does vocabulary learning via gamification affect your English? What difficulties have you encountered in using gamification to learn vocabulary?

4- **Learning logs**

The students wrote 4 learning logs in which they reflected on their vocabulary learning, challenges, and how they solved them. However, some students did not write.

5- *Quizizz* **Application:**

Quizizz is available online at http://quizizz.com. This application is a free, user-friendly interface and adaptable to different platforms. The first step is to log in as a teacher to use this website or create quizzes on it. Next, the teacher creates a class that generates a code for students to join the class (see **Figure 1**). After students join, the teacher can then create their *Quizizz* or select a suitable one from the available. In creating a new *Quizizz* or adapting ready-made quizzes, the teacher can insert a picture, arrange questions randomly, and determine if the quiz is public or private. Once the quiz is ready, the teacher sends the students a code number to access the quiz and answer it. The teacher can assign the quiz as homework or use it in a live-game mode. The teacher can access students' progress through a *Quizzez* website report, as shown in **Figure 1**.
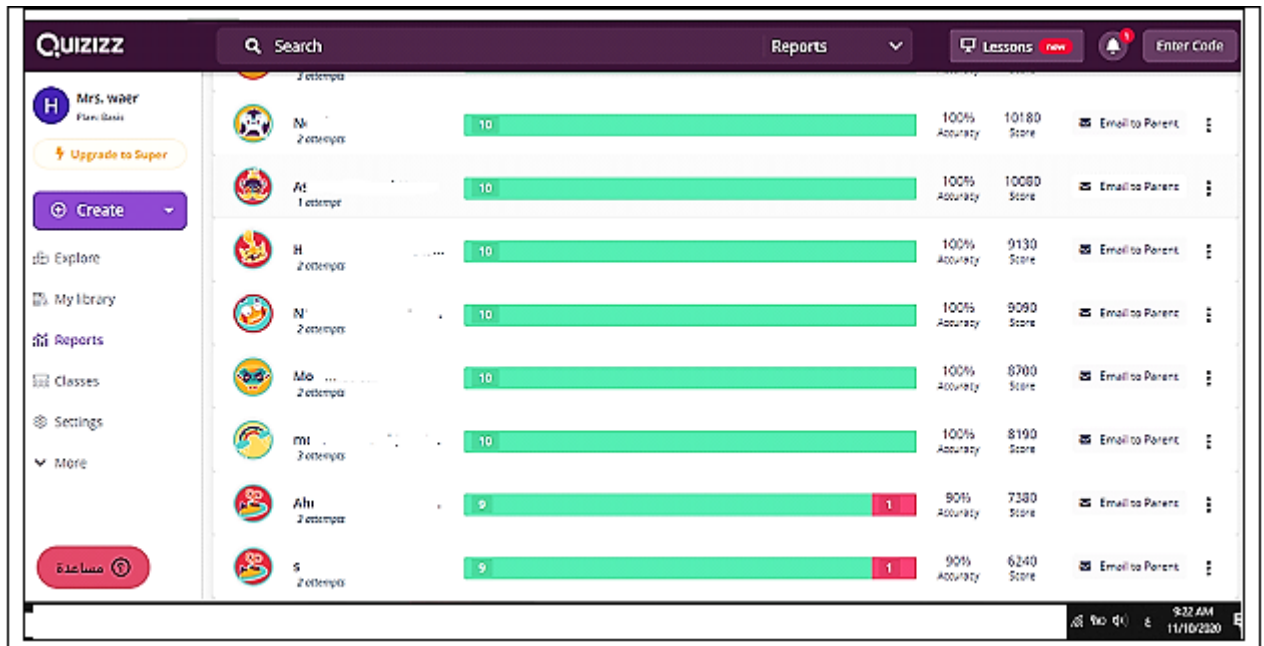
Figure 1 Student's Board View in *Quizizz*

The teacher can also access the percentage of the students' answers. As shown in **Figure 2**, the first and second students answered all questions correctly, whereas the third student answered question 10 incorrectly.
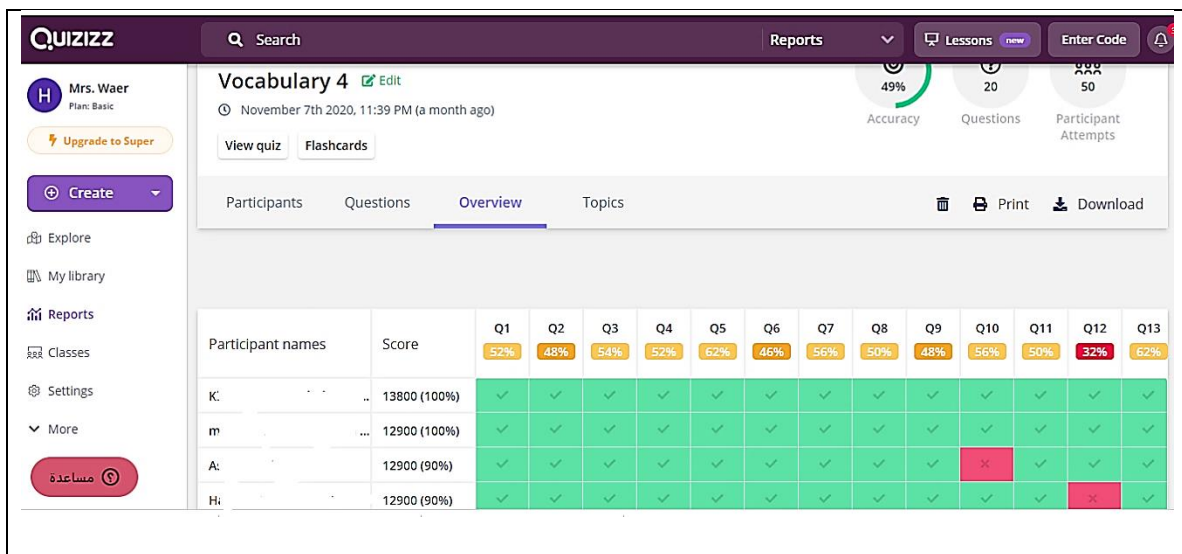

Figure 2 Questions Overview on *Quizizz*

Procedures

This study was conducted during the first semester of October/December 2020). The gamification applications used in this study were *Quizlet* and *Quizizz*, and *Kahoot!* The researcher chose them based on reviewing literature and students' preferences. They are also user friendly. After explaining the research agenda and then getting students' consent, the researcher administered the vocabulary test as a pre-test in the last week of October. The control group studied the vocabulary using paper-based worksheets. Two online classes were

created on both *Quizizz* and *Quizlet* and the experimental group students joined following an invitation link. A WhatsApp group was also established to communicate with students (sending games codes) and facilitate any obstacles that might face them on the gamification websites. Besides, the winners were announced after each live game. The researcher both designed some quizzes and adapted other available quizzes. *Quizlet* was used for studying vocabulary *via* different modes as flashcards, learn, match and gravity, whereas *Quizizz* was used for live *Quizizz* and assigned homework tasks. Kahoot was used 3 times, but students did not prefer it. Quizizz was used mostly. The students were assigned one quiz per week and two live quizzes. Noun, verb synonyms, antonyms, word definition, transitions, vocabulary in sentences and collocations were the vocabulary quizzes' content. At the end of the semester, the vocabulary test was administered in class, followed by the attitude questionnaire. Then, follow-up interviews were conducted.

Study Design

The study is a mixed-methods design where the researcher collected qualitative and quantitative data. Students were randomly assigned to a control group (N=33) and an experimental group (N=35). The APTIS vocabulary test was administered to both groups before and after the experiment. The questionnaire was administered only to the experimental group after the study, followed by interviews to get in-depth insights into students' responses to the questionnaire.

Results and Data Analysis
Effect of Gamification Activities on Students' Vocabulary Knowledge
Figure 3 visually presents the changes in mean scores across time in the vocabulary test. The figure shows that both the experimental and control groups' mean scores are close in the pre-test. Independent sample t-test for the vocabulary pre-test showed no significant difference between the two groups t (64) = -1.586; p= .118, which indicates the groups' homogeneity. However, the experimental group's means scores noticeably increased in the posttest, whereas the control group slightly increased.
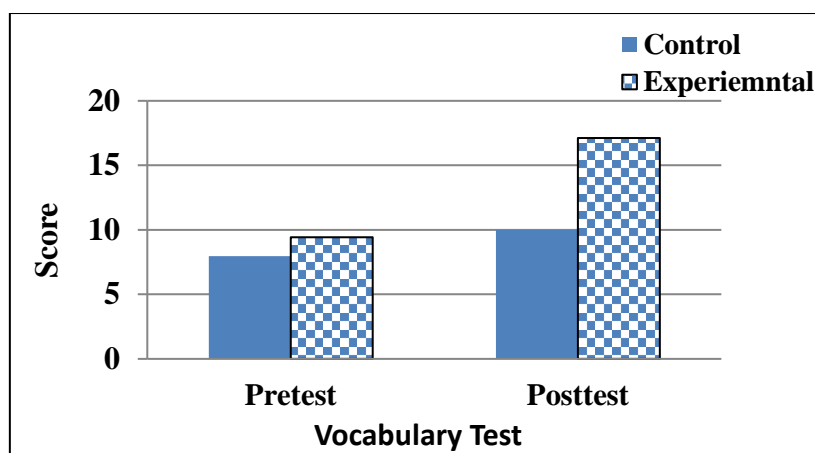
Figure 3 Mean Scores in the Pre-Post Vocabulary Test.

An independent sample t-test was run to examine the significance of the difference in mean scores of the vocabulary posttest. The results in **Table (3)** show a significant difference between the two groups (t(66) = 7.113; p= 0.001) with a mean difference of 7.11   in favor of the experimental group.

Table (3) Independent Sample T-Test for Vocabulary Posttest

Group	N	Mean	SD	t-value	df	Sig.	Partial Eta Squared
Experimental	35	17.11	4.912	7.113	66	.000	.434
Control	33	10.00	2.894				

  * p <0.05

Therefore, hypothesis one states that 'There would be a statistically significant difference between the means of scores obtained by students in the experimental and control groups in the post-administration of the Aptis test in favor of the students in the experimental group,' was accepted. Cohen's d is 1.857 $\cong$ 1.86, whereas partial eta-squared (η^2) is 0.43 (**Table 3**). Both indicate a large effect size, which implies the significant effect of using gamification quizzes on the experimental group vocabulary learning.

Further paired sample t-tests were run to examine the increase in vocabulary knowledge for the study groups. As for the experimental group, the difference was significant. The paired sample t-test in **Table (4)** shows that the mean difference (7.68) between the pre and post administration of the vocabulary test was significant (t (34) = 10.81; p = .001). Cohen's d value was 1.83, which indicates a big effect size and consequently shows that the experimental group considerably benefited from gamifiying vocabulary learning.

Table (4) Paired Sample T-Test for Vocabulary Pre-Posttests of the Experimental Group

	N	Mean Difference	SD difference	Df	t	Sig. (2-tailed)
Pair 1 **Posttest -Pre-test**	35	7.686	4.206	34	10.810	.000

As for the control group, the paired sample test in **Table 5** shows that the mean difference (2.03) between the pre and post-administration of the vocabulary test was significant (t (32) = 2.86; p = .007). Cohen's d value is 0.50, which is medium. This value indicates that the control group slightly benefited from traditional vocabulary learning.

Table (5) Paired Sample T-Test for Vocabulary Pre-Posttests of the Control Group

	N	Mean Difference	SD difference	Df	t	Sig. (2-tailed)
Pair 1 **Posttest -Pre-test**	33	2.03	4.073	32	2.863	.007

Students' Attitudes toward Gamification Experience

Regarding the second research question, the attitude questionnaire was employed to evaluate the participants' perception of the gamification learning experience. The statements of the questionnaire were grouped according to usefulness, engagement, and overall perception. The results illustrated in **Table (6)** indicate the participants' positive attitude toward gamification, with mean scores of 4.02, 4.27 and 4.17 for usefulness, engagement, and overall perception, respectively. The results are elaborated in more detail below.

Table (6) Descriptive Statistics of the Attitudes Questionnaire

Parts	Mean	SD	Min	Max	Mode	N. of items
Usefulness	4.02	.879	2	5	4	٤
Engagement	4.27	1.094	1	5	5	3
Overall Perception	4.17	.901	1	5	4	5

Usefulness

The result of items 1 to 4 showed that most of the students (85.7%) agreed or strongly agreed that gamification helped them learn vocabulary, whereas only 8.6% disagreed. The students perceived the gamified vocabulary activities as effective and helpful in remembering new words, using them and suiting their learning style. As **Table (6)** illustrates, the most frequent response was 'agree' (Mode =4). This indicates that most students perceived gamification as a useful tool in learning English vocabulary.

Engagement

The second part (items 5 to 7) was about how much using gamification engaged the students. 85.7% of the participants agreed or strongly agreed that using gamification engaged them with their learning through the competitiveness and challenging features and providing an enjoyable learning context. Interestingly, the mode of statistics is 5, according to **Table (٦)**, indicating that most participants strongly felt engaged with the gamification platform. For example, in response to statement 6 ", I like the competitiveness and challenging features of *Quizizz*."   85.7% of the students agreed or strongly agreed. Just less than 9% of the

participants disagreed with the statement. This result shows that the students were highly engaged with gamification.

Overall perception

The results of the third part (items 8 to 12) clearly showed that most participants had an overall positive attitude toward gamification use as 88.6% agreed or strongly agreed. This is shown in **Table (٦)** as the most frequent response was 'agree' (Mode =4). For example, in response to item 8, which stated 'learning vocabulary using gamification is more helpful than traditional exercises' (M= 4.51, SD = 1.04), 32 (91.5%) students agreed or strongly agreed, and just less than ٦% of the participants disagreed with the statement. Further, 31 students (88.5%) preferred that teachers use gamification in EFL classes (*M* = 4.54.85; *SD* =1.039) while students who disagreed were 5.7 %.

Results of the Qualitative Data

The semi-structured interviews and learning log data were analyzed and presented into three themes: benefits of using gamification in vocabulary learning, engagement with gamification and overall perceptions of gamification experience.

Benefits of Gamification in Vocabulary Learning

Some students elaborated on their vocabulary gains in the interview.

>   -*This method (gamification) adds to our vocabulary stock. I mean a considerable amount of words which we did not study before."*

Other *s*tudents also showed how they used the new words they practiced in gamification.

>   - *'Gamification has increased my vocabulary, which helped me use the new words in my writing."*
>   -*"It helped me learn a lot of new words and idioms."*

Some students showed explicit examples of learned new vocabulary or strategies in their Learning logs:

>   - ***"I began to develop the skill of anticipating a word from the context of the sentence and trying knowing its meaning without resorting to dictionaries."***

>   - *"It also has an effect on my learning style as I started collecting new words in a notebook so that I will not forget them."*

>   - *" This week, I learned a lot of new words such as 'stitches' which is used when you have a cut in your body and 'profit' which means gain money or wealth."*

>   -

Engagement with Gamification

 The data elaborated on the elements that made students felt engaged and why they enjoyed learning vocabulary using gamification. For example, some students' accounts implied their engagement with gamification quizzes.

> *"In gamification, we learn and enjoy at the same time. We can use it in our free time and make useful things for our future. Not only this, but it also develops the spirit of cooperation and teamwork".*

The **features** of gamification also helped students like it.

> -*"I like the challenging spirit to get the best rank."*

> -*"It helped me to think in English, which in turn facilitates mastering language in the right way, and getting far away from literal Arabic translation."*

Perceptions of Gamification experience

The qualitative data showed positive perceptions of gamification. Some students were eager and willing to use gamification in learning English in the future. Most students felt motivated toward using gamification in learning English in general. Students expressed their overall positive attitude toward gamification in different ways:

- *"I do love these games; I hope you continue in these games."*
- *"It's very enjoyable and useful and I learned a lot from it."*
- *"I don't have any comments. Really, it's excellent and successful."*

In short, the participants generally expressed a positive view toward using gamification in learning English vocabulary over regular classrooms. Nevertheless, students also reported some challenges as internet access and time restrictions.

Discussion

In this study, the researcher utilized gamification in various vocabulary activities recommended in previous studies (Zou, Huang, & Xie, 2019). Students who used gamification displayed higher APTIS vocabulary test performance than those who studied using the traditional way. This progress might be attributed to gamification activities that supported vocabulary knowledge growth. As employed in the present study, gamification might have motivated the participants to spend more time and take many attempts in the vocabulary games until they get satisfied with their ranks. As gamification meets satisfaction needs (Xi & Hamari, 2019), so it might have encouraged them to attempt many quizzes which helped practice some vocabulary strategies and enhance lexicon competence.

The present study findings indicated that using gamification appears to be effective in enhancing students' vocabulary knowledge. This result is consistent with the previous studies

that also reported a positive effect of gamification on vocabulary learning (Retherford, 2020; Permana and Permatawati, 2020; Nahmoud, 2019; Pede, 2017) but disagrees with the results of Bal (2018), who did not find a significant effect on vocabulary. This study's findings also go in line with previous studies that reported positive emotional gains of gamification on confidence, attitudes, motivation, and engagement (Retherford, 2020; Xi & Hamari, 2019; Huang & Hew, 2018; Calvo-Ferrer, 2017; Chaiyo & Nokham, 2017). This study's participants showed a generally favorable attitude toward using gamification applications in vocabulary learning and positive perceptions of gamification challenging and competition features. This finding also coincided with Pede (2017), who found that using gamification was perceived by students as helpful in vocabulary learning. The live gamification quizzes applied in this study were more motivating and engaging for learners than traditional classes and this was also assured in previous studies (Xi, N., & Hamari, 2019; Nahmoud, 2019; Medina & Hurtado, 2017; Wu & Huang, 2017).

Gamification provided an asset for students to learn at their pace, to compete with others and compete themselves to reach their best level (Hanson-Smith, 2016). As a digital tool, gamification helps to stimulate extrinsic and intrinsic motivation in EFL learners and helps them learn outside the classroom boundaries. Using such an unconventional tool might have contributed to the significant improvement in the vocabulary knowledge of the participants who used gamification as 'introducing new technologies into language learning environments has the potential to boost learner motivation' (Stockwell, 2013, p. 157). Participants in this study were particularly impressed by the different gamification elements in the Quizziz platform, including boards, points, badges, avatars, trophies, and competitiveness. Such challenging gamification nature helped minimize the boring manner of memorizing words and time constraints inside or outside the traditional classroom. Besides, immediate or delayed feedback (Sun & Hsieh, 2018) in testing or learning mode is another gamification feature that facilitates and scaffolds vocabulary learning. Thus, many learners favor gamification in their EFL vocabulary learning and perceive it as a useful and successful method.

To sum up, in this study, gamification was deemed effective in enhancing EFL learners' vocabulary knowledge. Gamification efficiency may be due to its challenging and motivating nature in adding inspiring gaming elements to traditional learning. Thus, gamification helped students enjoy and learn simultaneously. Nevertheless, they also faced some challenges as internet access, which should be considered by its users.

Implications:

The study was significant in using a recent method that positively affected students' attitudes toward gamification. Consequently, it provides an example for integrating gamification in EFL Egyptian university classes, which has not been researched adequately in the Egyptian context. In so doing, it presented a practical model for helping university students overcome vocabulary difficulties, which might help their academic success. This study appears to open new avenues for researchers interested in investigating how integrating gamification can enhance vocabulary learning. This study suggests using gamification as an engaging resource

in teaching vocabulary, which may foster learners' motivation in using tools that improve their lexical competencies. The study results may also guide EFL specialists and developers to integrate gamification quizzes in courses and programs as one of the most motivating trends used recently in learning EFL.

The present study provides some pedagogical implications to EFL educators. First, in teaching vocabulary, it is recommended that teachers should be trained to incorporate gamification features in their classes or online and engage their students in learning English using modern methods. Moreover, material designers should incorporate gamification based learning in EFL curriculum and language programs, especially with the availability of tablets and smartboards in our Egyptian secondary classes and the online assessment of high school students. In this way, they can manipulate the existing technology and support the 2030 Egyptian vision application. They should also consider the challenges teachers or students face when using gamification and provide alternatives to overcome them.

Conclusion

In this mixed-methods study, the researcher investigated gamification effects on vocabulary knowledge among English majors at the Faculty of Education and explored their attitudes toward gamification use. The findings revealed that the students who used gamification in learning vocabulary outperformed their counterparts who used vocabulary paper sheets, as indicated in the APTIS vocabulary posttest results. The results showed that the experimental group's vocabulary knowledge significantly increased on the APTIS posttest with a big effect size (Cohen's d = 1.8, eta squared= 0.47). The data obtained from the questionnaire and the interviews have shown that most students hold positive attitudes toward using gamification in vocabulary learning. The interviewees found gamification more enjoyable and exciting than traditional learning methods. However, they experienced some challenges in internet access. This study supports and recommends the use of gamification in EFL classes.

Nevertheless, this study is limited to a small sample, short-term treatment, and one gamification application focusing only on vocabulary. The results of this study are not generalizable to all EFL learners at the university level. Therefore, further studies are suggested to extend research in this new area. More empirical longitudinal studies are needed to investigate gamification's effects on different language skills in various schools as high, preparatory or primary schools. Future studies are required to investigate the correlation between students' attitudes toward gamification use and their learning vocabulary styles, language anxiety, testing anxiety, autonomy, gender differences or proficiency levels. Finally, a comparison between different gamification applications may be another area to be examined.

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Appendix (A) Students attitudes towards gamification

No.	Item	Mean	SD
1	Using Gamification helped me remember the meaning of English words.	3.94	1.027
2	Gamification is suitable for my style of vocabulary learning	4.06	.906
3	I learned many words after using Gamification	4.06	1.235
4	The vocabulary I gained from Gamification helps in learning English	4.03	1.043
5	Learning vocabulary using gamification was enjoyable.	4.29	1.405
6	I like the competitiveness and challenging features of *Quizizz*.	4.40	1.193
7	I feel motivated when playing *Quizizz*.	4.11	1.078
8	Learning vocabulary using gamification is more helpful than traditional vocabulary exercises .	4.51	.919
9	Learning vocabulary using Gamification has increased my confidence**.**	3.97	1.014
10	I found *Quizizz* and *Quizlet* familiar and simple to use.	3.86	.912
11	I will use Gamification in the future to learn English.	3.94	1.259
12	I wish teachers use gamification in English teaching classrooms.	4.54	1.039
Sum		49.71	9.966

استخدام محفزات الالعاب التعليمية فى تعلم مفردات اللغة الثانية و اتجاهات المتعلمين نحوها

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المستخلص

هدفت هذه الدراسة الى تحديد تأثير استخدام محفزات الألعاب التعليمية على تعلم مفردات اللغة الانجليزية واتجاهاتهم نحوها. اتبعت الدراسة تصميم الشبه تجريبي. شارك في هذه الدراسة ٦٨ طالبا من كلية التربية بجامعة الوادي الجديد. تضمنت الأدوات اختبار المفردات للغة الانجليزية (APTIS) واستبيان الاتجاه ومقابلات شخصية. استخدمت المجموعة التجريبية Quizizz بينما استخدمت المجموعة الضابطة أوراق مفردات ورقية. و استغرقت الدراسة فترة مدتها سبعة أسابيع ، تم اختبار الطلاب بعد ذلك. أظهرت النتائج زيادة تعلم المفردات في المجموعة التجريبية مقارنة بالمجموعة الضابطة. و كان حجم التأثير على المجموعة التجريبية ملحوظ (Cohen's d = 1.8). أشارت بيانات الاستبيان والمقابلة إلى اتجاهات إيجابية تجاه استخدام محفزات الألعاب التعليمية في تعلم مفردات اللغة الانجليزية. وجد الأشخاص الذين تمت مقابلتهم أن محفزات الألعاب التعليمية أكثر إثارة من طرق التعلم التقليدية. وذكروا أن استخدام محفزات الألعاب التعليمية في تعلم المفردات أكثر متعة من التمارين التقليدية. ومع ذلك ، فقد واجهوا بعض التحديات في الوصول إلى الإنترنت. توصي الدراسة باستخدام محفزات الالعاب التعليمية كأداة تيسيرية وتحفيزية لتعلم المفردات.

الكلمات المفاحية : محفزات الألعاب التعليمية , تعلم مفردات اللغة الانجليزية , معرفة المفردات , الاتجاه نحو محفزات الألعاب التعليمية