Kahoot, is it fun or unfun? Gamifying vocabulary learning to boost exam scores, engagement, and motivation

Ahmad Ridho Rojabi[1,2]*, Slamet Setiawan[1], Ahmad Munir[1], Oikurema Purwati[1], Rizka Safriyani[3], Nina Hayuningtyas[2], Siti Khodijah[2] and Rengganis Siwi Amumpuni[4]

[1]Department of Language and Literature Education, Universitas Negeri Surabaya, Surabaya, Indonesia, [2]Department of English Education, Universitas Islam Negeri Kiai Haji Achmad Siddiq, Jember, Indonesia, [3]Department of English Education, Universitas Islam Negeri Sunan Ampel, Surabaya, Indonesia, [4]Department of English Education, Universitas PGRI Madiun, Madiun, Indonesia

In language learning environments, technology is rapidly manipulated to encourage engagement, promote autonomy, and boost motivation. Many instructors have initiated to exploit online platforms and tools as a more engaging alternative to conventional activities. One of the engaging, and enjoyable games is Kahoot. The purpose of this study is to perceive the course content of Kahoot in the classroom to increase exam scores in vocabulary, and boost student engagement, and motivation. In addition, this study also explored the issues encountered by students in vocabulary learning through Kahoot. The impact of gamification on student achievement was assessed using quantitative and qualitative methods on the first-year students of the English department (N = 82). The findings revealed that incorporating Kahoot for teaching vocabulary effectively allows learners to expand a deeper understanding of vocabulary and course concepts indicated by exam scores improvement. This method also has a positive impact on student engagement as well as motivation. Furthermore, rigorous future research is needed to fully understand Kahoot's efficacy and to improve pedagogy in the vocabulary classroom.

Introduction

This era is recognized for the persistent expansion of technology and the pervasive incorporation of innovative and powerful technological accomplishments into people's lives (Kalogiannakis and Papadakis, 2019b). The emergence of innovation in several digital platforms that aimed to leverage student participation and engagement in

classroom learning and to create positive behavior in the classroom is called gamification (Bicen and Kocakoyun, 2018). In addition, it creates a more interesting, competitive, and attractive learning environment for students, hence the new learning experience gained by students will be able to increase their engagement, motivation, achievement, and interaction (Kalogiannakis et al., 2021). In various learning models, including gamification, motivation is the main indicator to achieve student success. When the gamification design incorporates elements of motivation in the learning environment, the learning process will be more effective, fun, and interesting. Gamification is in great demand by students because there are social, cognitive, and emotional to the game itself (Domínguez et al., 2013). Element of humor is also often included in gamification (Coller and Scott, 2009), is personally designed, intricately designed, and levels up increasingly complicated questions. The increasing difficulty level drives the user's cognitive, skill, and participation level. Gamification in language learning that is interesting, and engaging is very suitable for the current millennial generation (Bosworth, 2012). Therefore, when complex questions are presented to students in the form of fun games and a humorous learning environment in a vocabulary classroom, it builds student-content interaction, creates a positive classroom atmosphere, and promotes a positive impact on student vocabulary learning progress, engagement, and motivation. Kahoot's gamification of language learning has been beneficial in presenting new material and boosting more interactive and enjoyable learning that motivates students to participate and understand the content better. As a result, this study looked into how Kahoot affects students' exam scores, engagement, as well as motivation. It also addressed the challenges that students encountered while learning vocabulary using Kahoot gamification.

Review of literature

Concept of gamification

The term "gamification" refers to the use of game design features in non-gaming contexts (Deterding et al., 2011). Hung (2018) highlighted a worthy discussion that gamification can alleviate English learners' anxiety about practicing English and drive them to play an active role in academic tasks, and there is considerable evidence to support this. One of the most prominent gamified tactics in the classroom is role play. As it can promote learner engagement, gamification can be valuable to classroom instruction. The truth is that many instructors struggle with student motivation and engagement in their courses not currently in the teaching profession. Educators have attempted a range of solutions in the past, including the use of motivational approaches. The intervention's effect, on the other hand, lasted for a brief time. Gamification can be an attractive

solution to enhance engagement, motivation, and learning outcomes as it provides enjoyable and entertaining nature (Kim et al., 2018; Kalogiannakis and Papadakis, 2019b; Rivera and Garden, 2021). Students are more confident to engage in the activities, and peer collaboration is improved, allowing for collaborative learning (Xezonaki, 2022). Similarly, Hung (2018) confirmed that including games is another strategy for increasing learners' motivation to learn English and decreasing their anxiety about pursuing the language.

Gamification relationship with interaction in an online course

Faculty members are not easy to control their students' participation in an online course whether they are following all tasks in synchronous learning or not (Dixson, 2015; Tomas et al., 2015; Çakiroğlu and Kiliç, 2018). Moore (2013) highlights the theoretical framework of interaction in synchronous learning and that distance learning is closely related to interaction and student engagement. Similarly, Cronk (2012) argues that student interaction and participation are interrelated in online learning. Furthermore, Moore (1989) classified three types of interactions in online learning: student-student interaction, student-instructor interaction, and student-content interaction. Moore also added the importance of selecting the appropriate digital tools based on student needs and supporting collaboration, communication, and cognition. To maximize online learning, course content needs to be carefully designed, taking into account relevant and enjoyable tasks and teaching materials, as well as adjusting the main learning objectives (Abrami et al., 2012; Rojabi et al., 2022). By providing gamification in the language classroom, the atmosphere becomes comfortable and motivates the learners in the language classroom activities (Çakiroğlu and Kiliç, 2018). Gamification successfully helps the learners to enhance student-content interaction better so that they can comprehend the materials optimally (Muntean, 2011). Empirically, several studies confirm that gamification could boost student participation and enhance learning outcomes (Cassells et al., 2015; Darejeh and Salim, 2016; Çakiroğlu and Kiliç, 2018).

Student engagement and motivation

We highlighted conceptual grounding from Astin (1984) regarding student engagement theory and Kahn (1990) who proposed four theoretically grounded learner engagement elements: emotional engagement, physical engagement, cognitive engagement within the class, and cognitive engagement beyond the class. It is critical to pay attention to the engagement of students in the classroom to advance the quality of their learning and it becomes the foremost

indicator of the quality of post-secondary education (Lutz and Culver, 2010; Baszuk and Heath, 2020). Student engagement has a positive impact on students, institutions, and other related organizations. Thus, it will create a more conducive relationship and cooperation with other learners improve communication, as well as facilitate students to acquire and develop new skills and experiences. The basic principle of engagement is believed to be a crucial element in enhancing the learning experience and self-progress (Sun and Rueda, 2012). Enhancing learners' academic engagement is one strategy to alleviate their insecurities and apprehension and motivate them to study English (Ho, 2020). Academic engagement can be classified into three categories: behavioral, cognitive, and motivational (Linnenbrink and Pintrich, 2003). Learners' readiness to concentrate on the lesson and engage actively in discussions is referred to as behavioral engagement. The amount of effort students experiences in organizing and reviewing their knowledge is associated with cognitive engagement. Students' motivational engagement is defined as their passion for the topics they are taking, as well as their behavioral responses to their instructors and peers.

A closer exploration of Ryan and Deci's (2000) self-determination theory as a framework to understand aspects that support or challenge intrinsic motivation, self-directed extrinsic motivation, and psychological health, all topics that have practical relevance to the educational context. They shed light on the self-determination theory and its role in promoting intrinsic motivation. Individuals are guided to be engaged or isolated in social environments by the intrinsic motivation components of self-determination theory, and these factors promote or inhibit the natural process of self-motivation learning development (Deci and Ryan, 1985; Ryan and Deci, 2000). For instance, self-motivation increases when learners are satisfied with the courses provided. The courses should facilitate the learners with interactive and enjoyable tasks.

Intrinsic motivation encourages learners' responsibility for achieving goals and provides more autonomous learning (Ceylan, 2021). Learner autonomy has become an issue that is often discussed in the field of language teaching for more than three decades (Holec, 1981). Holec confirms that learner autonomy is an individual's capacity to control their learning and take responsibility for decision–making such as identifying materials, goals, and advancements, as well as selecting strategies and procedures, monitoring acquisition procedures, and evaluating what has been acquired. This theory is strengthened by Benson. (2013), who divides the concept of control into three levels: control over learning management, control over cognitive processes, and control over learning content. Benson emphasized that learner autonomy can be evolved through the three processes by commencing with handling planning, managing, and assessing at the first stage; progressing to initiating learners' attention to linguistic competence, representing their learning, and constructing

metacognitive skills in the second stage; and eventually, being allowed to choose the targets and sources of their learning at the top level. Furthermore, a more holistic view of learner autonomy is presented by Little (2002), showing that learner autonomy entails awareness, a positive attitude, and a willingness to be proactive in self-management and engagement with others. Some studies revealed that students prefer to be in authority of their learning experience, and they can experience more proficiency and motivation when they are allowed to take decisions (Cotterall, 1995; Tseng et al., 2020).

Teaching vocabulary with digital tools

Vocabulary acquisition has been considered overwhelming at times. The use of digital games can effectively motivate and enhance students' vocabulary learning, as well as demonstrate a variety of game learning environments in which varying factors can result in drastically different learning outcomes (Tsai and Tsai, 2018). Digital games in an educational context can create an enjoyable learning environment so that learners are engaged and motivated to interact with course content (Papadakis and Kalogiannakis, 2018; Kalogiannakis and Papadakis, 2019a; Papadakis et al., 2020). Adopting Mayer's (2015) theory on gamification, who presented three sets of questions regarding value-added, cognitive-consequence, and media-comparison type. The first question asks about which features of a game enhance academic learning. The second question asks whether playing a commercial game improves cognition. The third question considers asks whether people learn more academic material from online games than from traditional media. Digital innovation has been leveraged to enhance learning vocabulary as it provides students with textual, graphic, and auditory input to the user mediated by audio and image flashcards, visual animations, and virtual worlds as well (Lin, 2009; Wang and Vasquez, 2012). Several researchers have proven the effectiveness of second language learning vocabulary with multimedia tools and have recommended it to other researchers to conduct a further extensive investigation (Chang, 2006; Tseng et al., 2020).

Multimedia on vocabulary acquisition

Dual Coding Theory (DCT) from Paivio (1986) explains the positive impact of interactive multimedia on vocabulary acquisition. DCT depicts discourse coding as the construction of two schemas: the verbal scheme and the non-verbal scheme. When knowledge is coded in both schemes, the two types of knowledge strengthen each other *via* denotative connections (Paivio, 1986), resulting in greater retention and memory than when the knowledge is coded in only one system. Furthermore, the interaction of visual, textual, and auditory input can

create a situation that is relevant and meaningful for the demonstration of vocabulary, facilitating acquisition (Folse, 2006; Stuart Webb., 2008), even for low-proficiency learners (Chang, 2006). Along these lines, Hong (2010) confirmed that the use of multimedia can facilitate language learning in a variety of ways, including enhancing learner enthusiasm, increasing learners' motivation, fostering autonomous learning, shaping interactive and experiencing learner styles, and supporting exploration abilities.

Prior studies related to the effectiveness of Kahoot on student acquisition, engagement, and motivation

An article review was conducted by Kohnke and Moorhouse (2021), exploring how language teachers are taking advantage of the free version of Kahoot gamified learning to increase student engagement and their academic progress. The findings showed that the teacher has an important role in language learning with the gamification model as the host and the student's role as a competitor. Gamification language courses mediated by Kahoot are successfully introduced new content, and provide more interactive and fun learning so that students are motivated to compete and master the language material. Furthermore, experiential learning gamification with Kahoot in language classes creates a better learning environment to enhance millennial student engagement and assists them in developing a deeper comprehension of words and topics while also providing instant feedback. Kahoot also assists students in connecting course concepts and improving their scores (Baszuk and Heath, 2020).

Numerous prior studies have demonstrated the effectiveness of Kahoot gamification in the higher education context (Bicen and Kocakoyun, 2018; Wichadee and Pattanapichet, 2018; Guardia et al., 2019; Holbrey, 2020; Figuccio and Johnston, 2021). Guardia et al. (2019) performed a case study in the higher education context. The data acquired in the questionnaire demonstrates that students generally enjoyed the use of Kahoot, the results presented that this app is a perfect example of gamification, it could be assumed, with some risk of error, that these new study techniques enhance students' perspectives of the particular topic, as these tools increase student engagement in the classroom while continuing to improve their experience by providing them with technological tools that can be replicated in the future. In a higher education context using a mixed-method study (Figuccio and Johnston, 2021). Students claimed Kahoot made the class more engaging and interactive, so it assisted them in grasping course content. These findings show that Kahoot is a beneficial review platform. Additionally, students reported that Kahoot helped them better understand the concepts learned in the child development session.

Another study by Bicen and Kocakoyun (2018) looked at how gamification through Kahoot affected student achievement through intra-class competition that was evaluated both quantitatively and qualitatively. In this study, 65 students in the Department of Preschool Teaching were recruited, and the findings revealed that Kahoot incorporated in the classroom could increase students' interest, and boost students' ambition for academic progress. Additionally, this method was significant in improving student motivation. Moreover, an action research approach with data captured from pre- to post-surveys was used in the university setting (Holbrey, 2020). The results revealed that there were no technical difficulties in integrating synchronous online courses into lecture theaters, and gamification was effective in encouraging constructive engagement and collaboration. Students rated how competitive it was, how quickly they got feedback on their understanding, and how organized the possibilities for more discussion were. Students felt that their engagement, concentration, and memorization had improved.

Wichadee and Pattanapichet (2018) also found that gamification through Kahoot during an English language session improved students' satisfaction and motivation. Instructors adopt Kahoot to measure their students' comprehension. Learners must respond to specific questions, and scores are determined based on the amount of time spent and the number of correct responses. The learners' names will display on the leaderboard if they achieve high scores, motivating them to stay competitive. As they had to compete with their peers in the game environment, the students concentrated in class, and this drive resulted in higher academic achievement.

In this study, after carefully reviewing previous studies, the strengths and drawbacks of Kahoot on student engagement such as character limits for every quiz and network failures have already been addressed (Plump and LaRosa, 2017; Baszuk and Heath, 2020). However, to the best of our knowledge, few explored the students' perceptions of Kahoot gamification intervention on students' motivation in the context of English as a Foreign Language (EFL). Furthermore, investigations on how Kahoot intervention impact EFL students' vocabulary acquisition, particularly how it boosts their exam scores are scarce. Therefore, a more thorough investigation of the impact of Kahoot gamification on vocabulary acquisition among EFL undergraduate learners, and an investigation of the EFL learners' engagement as well as motivation toward the use of Kahoot are necessary to answer the four research questions listed below:

1. How does Kahoot impact the students' exam scores in vocabulary?
2. How does Kahoot impact students' engagement in vocabulary learning?
3. How does Kahoot impact students' motivation in vocabulary learning?

4. What are the issues that students encountered in vocabulary learning through Kahoot gamification?

Materials and methods

Description of the context and participants

The investigation recruited 82 students enrolled in the first semester of the 2021/2022 academic year at one of the government universities in Jember, Indonesia by employing purposive sampling. The participants were categorized into two groups: an intervention group (N = 42) who acquired English vocabulary with Kahoot intervention and a control group (N = 40) who received non-gamification through Kahoot. In the intervention group, 85.7% are females and 14.3% are males. The majority of students are between 16–20 years (95.2%) and 21–25 years (4.8%). Meanwhile, in the control group, 90% are females and 10% are males. The majority of students are between 16–20 years (85%) and 21–25 years (15%). The course they were completing was an English course as a required course for all English Department students in the first semester. We designed learning objectives aimed at boosting participants' engagement and motivation throughout this gamification vocabulary session. We extensively updated the instructions and resources given in Kahoot as a result of our commitment. In the first meeting, we presented academic instructions and guidelines for each task so that they could plan and prepare the topic for the following meeting (meetings 2–8). We motivated them to engage in active discussion and participation. Furthermore, we also provided feedback and comments to track their achievement in the vocabulary gamification classroom.

Instruments and data analysis

In this vocabulary learning through Kahoot sessions, we set up learning objectives focusing on boosting learners' exam scores, engagement, and motivation. We were in charge of and carefully developed well-instructions and engaging materials delivered in Kahoot sessions. The academic rules and instructions for every session and every task were explained in the first meeting including group discussion after the quiz. By doing so, they could prepare for learning topics for the next sessions (sessions 2–8). The students were also motivated to participate in the discussion after they receive their scores on every quiz. In every meeting, a quiz was given 30–40 min to assess the vocabulary acquisition that had previously been learned. Synonyms, antonyms, and sentence completion in terms of collocation, adjective, noun, adverb, and time are among the topics covered in the quiz. The quiz comprises a total of 20 questions. The benefit of using gamification in to provide the quiz is that it keeps students motivated and engaged in a pleasant learning environment and reduces their anxiety levels. Students can quickly acquire their scores and language proficiency level after taking the quiz. Additionally, students can receive comments and participate in discussions concerning submitted answers to the quiz.

A two-dimensional scale has been constructed for measuring the impact of a gamification technique through Kahoot on student achievement, student engagement, as well as motivation. Content validation of an instrument through expert judgment was conducted before distributing it to the students. Dealing with the questionnaires, there are 20 items of the Five-point Likert Scale questionnaires regarding two dimensions; student engagement (10 items) and student motivation (10 items). A student receives 5 points if they answer "strongly agree," 4 points if they answer "agree," 3 points if they answer "neutral," 2 points if they answer "disagree," and 1 point if they answer "strongly disagree." Those adapted questionnaires (Eltahir et al., 2021) have already met the validity and reliability. The questionnaire was distributed to experts from a variety of academic institutions to determine its reliability and validity. These experts provided written feedback on aspects of the questionnaire that can be enhanced or modified to ensure that the research objective is met. Cronbach's alpha was also used to assess the questionnaire's reliability. The Cronbach alpha rating for internal consistency was 0.835, indicating that the questionnaires were valid and reliable. The semi-structured interview through WhatsApp was recorded and these qualitative data were analyzed by using thematic coding. The thematic method is used to decode what the participants are discussing and to uncover the perspectives and experiences of the learners. The interview transcripts were reviewed several times to grasp the story's meaning and discourse, and thereafter the transcripts are coded according to the themes, sub-themes, and themes that might develop. Meanwhile, quantitative results were displayed as the means and standard deviation (SD), and qualitative data were displayed as excerpts. In this way, the impact of a gamification approach through Kahoot could be investigated based on the students' perceptions and their experiences in the gamification vocabulary classroom.

Results

Research question 1. How does Kahoot impact the students' exam scores in vocabulary?

We need to have a closer look at the impact of Kahoot by scrutinizing their scores on pre-test as well as post-test

TABLE 1 Mean and standard deviation of the students' pre-test and post-test of vocabulary test.

Vocabulary test	M	SD
Pre-test	45.00	14.77
Post-test	64.17	12.78

TABLE 2 Results of paired sample *t*-test for the students' pre-test and post-test of vocabulary test.

Test	M	SD	df	*t*-value	Significance	Size effect
Pre-test	45.00	14.77	41	−15.18	0.000	0.85
Post-test	64.17	12.78				

in vocabulary exams. Thus, we distributed the pre-test before the intervention and the post-test after the intervention to compare the students' vocabulary acquisition. To see whether the data were regularly distributed and homogeneous, normality and homogeneity tests were used. The P-value on Shapiro–Wilk ($n < 50$) of the pre-test was 0.188 and the P-value of the post-test was 0.212. It indicated that the P-value was larger than 0.05, we assume a normal distribution. Furthermore, The P-value on Levene statistics displayed that P-value was 0.760, which was greater than 0.05 so we assume homogeneous distribution. Table 1 presents the overall scores of students' pre-test and post-test vocabulary acquisition. Meanwhile, Table 2 displays the results of the paired samples' t-test scores, which revealed a significant difference between the means of the student's vocabulary pre-test and post-test scores. This points out that the post-test scores were better than the pre-test scores with an effect size of about 0.85%. We investigated the impact of Kahoot on students' vocabulary achievement by comparing their pre-test and post-test scores.

Research question 2. How does Kahoot impact students' engagement in vocabulary learning?

Table 3 displays that item 2 (the Kahoot game in learning was exciting for me) was ranked first based on the mean value (4.38 ± 0.79) and item 1 (I felt that using the Kahoot game pushed me to find out the topics correctly) was ranked as the second (4.26 ± 0.73). However, the mean score of item 5 (I was able to concentrate better during the Kahoot game than in regular lectures) was ranked as the least (3.67 ± 1.12). These results indicate that the overall mean score of the students' responses was 3.95 ± 0.96. All in all, the overall perceptions of the students

were positive toward Kahoot in terms of engagement. The criterion of responses using a Likert scale is classified as very little (1.00–1.80), little (1.81–2.60), moderate (2.61–3.40), high (3.41–4.20), and very high (4.21–5.0) (Eltahir et al., 2021).

A closer look at the responses from the students is displayed as follows. The learners were excited since quizzes enabled them to learn and play at the same time. Therefore, Kahoot gamification does not exhaust them when it comes to completing tasks.

> *We can learn while playing and certainly we get much useful knowledge (S1).*
> *Yes, it was, it doesn't make me bored to learn (S1).*
> *I'm so happy and excited to answer the quiz (S6).*

Kahoot also facilitates deep learning, prompting teachers to concentrate more on the topics they have learned, making the tests offered by Kahoot more enjoyable.

> *I think Kahoot is encouraging. By studying through Kahoot, students have a passion for deep learning because Kahoot is very attractive and enjoyable (S5).*
> *Based on my experience, I got an assignment through Kahoot to measure my ability and it was fun (S2).*
> *Yes, it was very useful for the learner to get some materials, quizzes, and information about English materials (S4).*
> *Very useful, Kahoot provides good features, highly beneficial and excellent quiz for study, and it provides very relevant and helpful information to us (S5).*
> *The quizzes are fun and not too difficult to answer, it can tell if our answer is correct or not correct (S7).*

Research question 3. How does Kahoot impact students' motivation in vocabulary learning?

Table 4 displays that item 6 (during the test, I felt encouragement and enthusiasm.) was ranked first based on the mean value (4.14 ± 0.98) and item 1 (I felt that playing the Kahoot game provided me the satisfaction of completing the test) was ranked as the second (4.14 ± 0.81). However, the mean score of items 10 (I only took the test because I liked the Kahoot game idea of learning and doing this test.) was ranked as the least (3.67 ± 1.12). These results indicate that the overall mean score of the students' responses was 4.09 ± 0.89. All in all, the overall perceptions of the students were positive toward Kahoot in terms of motivation.

Kahoot promotes a relaxing learning environment, it makes students feel enthusiastic and feel motivated. Participants

TABLE 3   Descriptive statistics of engagement.

No.	Items	Mean	SD	Order	Description
1	I felt that using the Kahoot game pushed me to find out the topics correctly.	4.26	0.73	2	Very high
2	The Kahoot game in learning was exciting for me.	4.38	0.79	1	Very high
3	I believe I did well on the test since I used the Kahoot game in the lecture.	4.02	0.84	4	High
4	I hope other lecturers use the Kahoot game.	3.76	1.08	7	High
5	I was able to concentrate better during the Kahoot game than in regular lectures.	3.67	1.12	10	High
6	Kahoot provides a more enjoyable and satisfying environment in the classroom.	3.86	1.00	6	High
7	I loved and valued getting feedback after each question while taking the test.	4.19	0.77	3	High
8	Due to the use of the Kahoot game, I was able to precisely answer test questions.	3.95	0.79	5	High
9	Although I disliked the course material, I felt so comfortable participating.	3.71	1.13	9	High
10	I only took the test because the teacher told me to do it.	3.76	1.03	8	High
	Total	3.95	0.96		High

TABLE 4   Descriptive statistics of motivation.

No.	Items	Mean	SD	Order	Description
1	I felt that playing the Kahoot game provided me the satisfaction of completing the test.	4.14	0.81	2	High
2	I liked taking the test through the Kahoot game since it motivates me to answer the questions.	4.11	0.83	5	High
3	I felt satisfied after completing my test.	4.05	0.99	8	High
4	I felt that using the Kahoot game provided me the satisfaction of finishing the learning topics.	4.05	0.88	9	High
5	Using the Kahoot game enabled me to answer test questions without help from others.	4.17	0.88	3	High
6	During the test, I felt encouragement and enthusiasm.	4.14	0.98	1	High
7	I think my time and effort were worth this lecture.	4.11	0.86	4	High
8	After playing the game, I am more confident in my comprehension of the topics.	4.10	0.85	6	High
9	I feel that using the Kahoot game assisted me to concentrate on the quiz to provide the correct response.	4.07	0.97	7	High
10	I only took the test because I enjoyed the Kahoot game idea of learning and taking this test.	3.98	0.92	10	High
	Total	4.09	0.89		High

responded positively to the quizzes, timings, and immediate scores when music is being used to supplement the quizzes: *The questions worked very well because it is followed by a game and music (S4).* Kahoot gamification is useful in modifying learning and assignments, providing new experiences, and motivating students to develop their vocabulary and speaking skills.

> *Yes, I agree that Kahoot can encourage and motivate us to participate because it can help us memories some vocabulary and improve our speaking in English (S3).*
> *Yes, Kahoot made us want to look for more vocabulary that we didn't know (S12).*
> *Kahoot is very simple, effective, and easy to use. Playing Kahoot gives me good experience because it can support me to learn (S5).*
> *Yes, Kahoot helps us to know some vocabularies (S10).*
> *Yes, because the quizzes were easy and help us to remember the grammar and the vocabulary (S7).*

Research question 4. What are the issues that students encountered in vocabulary learning through Kahoot gamification?

However, some issues were captured during the teaching and learning process. A closer look at the challenges encountered by students could be displayed as follows. The majority of learners express dissatisfaction with the length of time allotted to complete the quiz: *The time challenges me to answer quickly and precisely (S1). Time goes fast (S2).* Some revealed their difficulty in answering the questions due to their limited vocabulary: *I don't know about the English vocabulary in Kahoot (S10).* One student commented that poor internet connection is the major problem: *Maybe the challenge is on how we maintain our internet connection because previously I had an unstable internet connection so it was slow to join the quiz (S11).* Few students also expressed dissatisfaction related to the level of test difficulty.

I don't have any problems, maybe it's just my internet poor connection and the questions are too difficult, that's my problem (S5).

I don't think there's a problem, I just made a mistake in answering the quiz (S7).

While others voiced their complaint due to the limited number of participants. The quiz is divided into four groups, each with a maximum of ten students. When group 1's capacity is reached, participants must join group 2 and so on.

The room is full. In other words, we can say the room is limited to a few people (S8).

The first time I used it, I was confused and had a little trouble because I didn't know that Kahoot was only limited to 10 students so I couldn't join the first quiz (S7).

Discussion and conclusion

The purpose of this study is to perceive the course content of Kahoot in the classroom to increase exam scores in vocabulary, and boost student engagement, and motivation. In addition, this study also explored the issues encountered by students in vocabulary learning through Kahoot. First, concerning the course content of Kahoot, students felt delighted to join the quiz and could participate and concentrate on the course topics given. By doing so, gamification in the form of quizzes in the vocabulary classroom could enhance student-content interaction and successfully increase their exam scores. Baszuk and Heath (2020) emphasized the importance of enacting gamification through Kahoot to evaluate mid-term and end-of-semester learning outcomes as it can be adopted in vocabulary classrooms. The benefit is to measure their ability and whether there is progress from previous learning by providing interactive quizzes where they can immediately find out their point or score. This quiz can take 3–10 min depending on the number of vocabulary items and level of difficulty.

In a closer look at student engagement, this present study also revealed that they met satisfaction to engage in challenging quizzes. It facilitates them with course content reviews. This finding is also discussed by prior studies. The facilities of music, colors and the excitement brought by Kahoot successfully encourage students to be more focused, concentrated, and engaged in a fun classroom atmosphere (Plump and LaRosa, 2017). Kahoot is a visual graph of response, true vs. false, which creates an opportunity for instructors to reread and review missed material of more than 20% in the classroom. Therefore, the use of gamification through Kahoot can support the learning process, knowledge acquisition, short-term memory recall, and as well as metacognitive abilities (Kapp, 2012). All in all, Students enjoy and engage in reviewing

material and competing in quizzes through Kahoot gamification (Baszuk and Heath, 2020), and in the setting of higher education (Woodard and Mabry, 2018), students compete to get the most correct answers leveraging widely available and familiar technology (and points). You and your students will know how they performed right away, enabling you to provide additional information, identify mistakes, lecture, or have students engage or discuss correct (and incorrect) answers. It is enjoyable, engages students, provides out students' competitive nature, and has the non-confrontational sense of a game while enabling you to evaluate students' understanding of course concepts in the ubiquitous trivia game style.

The shift of delivery instruction to online has garnered a lot of attention and reduced students' interest and motivation in learning. The impact of Kahoot on students' motivation has been discussed in this present study, reporting that Kahoot can encourage and motivate the students to complete their course concepts and quiz, and help them memorize some vocabularies they already learned. By doing so, the student could interact with the content successfully in gamification synchronous online courses. This result is consistent with Martín-Sómer et al. (2021), who asserted that offering quizzes through Kahoot can increase student participation and motivation in small classes. Experience in the Kahoot class also shows the importance of quizzes to evaluate students' knowledge before defeating final exams. Furthermore, the acquisition of scores obtained from the Kahoot gamification-based quiz is significantly increasing. This happens as a pleasant learning environment in Kahoot gamification can support student motivation to achieve a level of success in an online learning environment. Similarly, Licorish et al. (2018) conveyed that Kahoot resulted in the improvement of student learning in the classroom, highlighting its effects on academic achievement, engagement, motivation, and experience for students. Other noteworthy studies suggest that gamification may minimize distractions, hence enhancing teaching and learning quality beyond that of conventional settings.

Furthermore, corroborating the results of this present study, Ebadi et al. (2021) reported that 80 university learners majoring in English language and literature completed a grammar session assisted by Kahoot, a free web game-based software. By distributing open-ended questionnaires as well as interviews, learners' responses to the positive and negative features of the application were elicited before and after its intervention. This conclusion is also discussed by Ruiz (2021), which claimed that Kahoot game-based learning can motivate learners' enthusiasm for the activities in the classroom and their determination to succeed, encouraging them to participate actively in the course. Action research with questionnaire data was developed to gather quantitative and qualitative data from undergraduate learners,

revealing that Kahoot was successful in boosting engagement and motivation to study, strengthening course concepts, and impacting a good learning environment. Furthermore, Kahoot sessions encourage students to study, concentrate on key concepts and reflect on their learning (Ismail et al., 2019).

However, this present study has some limitations, first, the sample size is small, and the collected data was not as diverse as it could be as this study only covers questionnaires and interviews. Hence, generalization to a larger population may be hindered due to the small sample size. Second, this present study enacted Kahoot gamification in the free version and provided quizzes for vocabulary classrooms. Further research needs to investigate the effectiveness of Kahoot in larger sample sizes, in other contexts such as elementary or secondary school, and for a diverse range of skills such as listening and speaking. Moreover, an in-depth investigation of qualitative or mixed-method research emphasizing more diverse research methodologies such as focus group responses or learner diaries can be designed to explore the impact of Kahoot on the students' vocabulary scores, student engagement, and motivation and how it impacts student satisfaction in accomplishing their target of vocabulary scores. Moreover, several aspects regarding learners' enthusiasm, attitude, and wellbeing need to be explored by providing empirical findings.

It is still critical for faculty members in creating a fun atmosphere in the vocabulary classroom, particularly in the EFL classroom. Thus, this present study contributes theoretically as it provides an enjoyable learning atmosphere, and boosts learners' achievement, engagement, as well as motivation in vocabulary language learning by exploiting Kahoot gamification. This positive learning experience is beneficial for learners to be engaged in vocabulary language learning activities and reduce their boredom. Concerning pedagogical implications, this study contributed to the benefits and challenges in vocabulary courses through Kahoot. Faculty members need to carefully plan and design vocabulary tasks in the context of EFL either in online or blended courses. However, Plump and LaRosa (2017) noted that some faculties could not exploit digital games in courses due to a lack of opportunity, expertise, or knowledge in digital literacy. Thus, this study sought to convince faculties to exploit gamification in their courses as it offers engaging and motivating sessions of vocabulary language learning and boosts learners' acquisition of vocabulary.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the patients/participants or patients/participants legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

AR designed the study, developed the manuscript, led the data collection, data analyses, and manuscript preparation. SS and AM contributed to the study design and data analyses. OP contributed to the study design. RS, NH, SK, and RA proofread the manuscript. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

Abrami, P. C., Bernard, R. M., Bures, E. M., Borokhovski, E., and Tamim, R. M. (2012). Interaction in distance education and online learning: Using evidence and theory to improve practice. *J. Comput. High. Educ.* 23, 82–103. doi: 10.1007/978-1-4614-1785-9

Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *J. Coll. Stud. Devel.* 251–263.

Baszuk, P. A., and Heath, M. L. (2020). Using Kahoot! to increase exam scores and engagement. *J. Educ. Bus.* 95, 548–552. doi: 10.1080/08832323.2019.1707752

Benson. (2013). *Teaching and researching: Autonomy in language learning.* New York: Routledge.

Bicen, H., and Kocakoyun, S. (2018). Perceptions of students for gamification approach: Kahoot as a case study. *Int. J. Emerg. Technol. Learn.* 13, 72–93. doi: 10.3991/ijet.v13i02.7467

Bosworth, A. (2012). Keas: Developing a successful game-based employee wellness program. *Games Health J.* 1, 189–191. doi: 10.1089/g4h.2012.0020

Çakiroğlu, Ü, and Kiliç, S. (2018). How to gamify?: Example scenarios for participation in synchronous online learning. *E Learn. Dig. Med.* 15, 254–266. doi: 10.1177/2042753018798166

Cassells, T., Broin, D. O., and Power, K. (2015). "Increasing student engagement with gamification," in *European Conference on Games Based Learning*, (Norway: Academic Conferences International Limited), 770.

Ceylan, N. O. (2021). The relationship between learner autonomy and motivation. *Turk. Online J. Educ. Technol.* 20, 150–158.

Chang, C. Y. (2006). *The effects on learning English alphabet via Internet multimedia for lower-achievement students.* Taiwan: National Taipei University of Education.

Coller, B. D., and Scott, M. J. (2009). Effectiveness of using a video game to teach a course in mechanical engineering. *Comput. Educ.* 53, 900–912. doi: 10.1016/j.compedu.2009.05.012

Cotterall, S. (1995). Readiness for autonomy: Investigating learner beliefs. *System* 23, 195–205. doi: 10.1016/0346-251X(95)00008-8

Cronk, M. (2012). Using gamification to increase student engagement and participation in class discussion. *EdMedia* 12, 311–315.

Darejeh, A., and Salim, S. S. (2016). Gamification solutions to enhance software user engagement: A systematic review. *Technol. Engin.* 32, 1–20. doi: 10.1080/10447318.2016.1183330

Deci, E. L., and Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. Netherland: Springer. doi: 10.1007/978-1-4899-2271-7

Deterding, S., Dixon, D., Khaled, R., and Nacke, L. (2011). "From game design elements to gamefulness: Defining "gamification"," in *Proceedings of the 15th international academic mindtrek conference: Envisioning future media environments*, New York, NY, 9–15. doi: 10.1145/2181037.2181040

Dixson, M. D. (2015). Measuring student engagement in the online course: the Online Student Engagement scale (OSE).(Section II: Faculty Attitudes and Student Engagement)(Report). *OLJ* 19:143.

Domínguez, A., Saenz-De-Navarrete, J., De-Marcos, L., Fernández-Sanz, L., Pagés, C., and Martínez-Herráiz, J. J. (2013). Gamifying learning experiences: Practical implications and outcomes. *Comput. Educ.* 63, 380–392. doi: 10.1016/j.compedu.2012.12.020

Ebadi, S., Rasouli, R., and Mohamadi, M. (2021). Exploring EFL learners' perspectives on using Kahoot as a game-based student response system. *Interact. Learn. Environ.* 2, 1–13. doi: 10.1080/10494820.2021.1881798

Eltahir, M. E., Alsalhi, N. R., Al-Qatawneh, S., AlQudah, H. A., and Jaradat, M. (2021). The impact of game-based learning (GBL) on students' motivation, engagement and academic performance on an Arabic language grammar course in higher education. *Educ. Inform. Technol.* 26, 3251–3278. doi: 10.1007/s10639-020-10396-w

Figuccio, M. J., and Johnston, M. (2021). Kahoot! Predicts exam scores and promotes student engagement. *J. Res. Innovat. Teach. Learn.* 21:2379. doi: 10.1108/jrit-07-2021-0051

Folse, K. S. (2006). The effect of vocabulary exercise types on L2 vocabulary retention. *Tesol. Q.* 40, 1–12. doi: 10.2307/40264523

Guardia, J. J., Del Olmo, J. L., Roa, I., and Berlanga, V. (2019). Innovation in the teaching-learning process: the case of Kahoot. *Horizon* 27, 35–45. doi: 10.1108/OTH-11-2018-0035

Ho, J. (2020). Gamifying the flipped classroom: how to motivate Chinese ESL learners? *Innov. Lang. Learn. Teach.* 14, 421–435. doi: 10.1080/17501229.2019.1614185

Holbrey, C. E. (2020). Kahoot! Using a game-based approach to blended learning to support effective learning environments and student engagement in traditional lecture theatres. *Technol. Pedag. Educ.* 29, 191–202. doi: 10.1080/1475939X.2020.1737568

Holec, H. (1981). *Autonomy and Foreign Language Learning*. Oxford: Pergamon Press.

Hong, X. (2010). Review of effects of glosses on incidental vocabulary learning and reading comprehension. *Chin. J. Appl. Ling.* 33, 56–73.

Hung, H. T. (2018). Gamifying the flipped classroom using game-based learning materials. *ELT J.* 72, 296–308. doi: 10.1093/elt/ccx055

Ismail, M. A.-A., Ahmad, A., Al-Muhammady Mohammad, J., Mohd Fakri, N. M. R., Mat Nor, M. Z., Mat, et al. (2019). Using Kahoot! as a formative assessment tool in medical education: A phenomenological study. *BMC Med. Educ.* 19:230. doi: 10.1186/s12909-019-1658-z

Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Acad. Manag. J.* 33, 692–724. doi: 10.2307/256287

Kalogiannakis, M., and Papadakis, S. (2019a). Evaluating pre-service kindergarten teachers' intention to adopt and use tablets into teaching practice for natural sciences. *Int. J. Mobile Learn. Org.* 13, 113–126. doi: 10.1504/IJMLO.2019.096479

Kalogiannakis, M., and Papadakis, S. (2019b). Evaluating the effectiveness of a game-based learning approach in modifying students' behavioural outcomes and competence, in an introductory programming course: A case study in Greece. *Int. J. .Teach. Case Stud.* 10:235. doi: 10.1504/ijtcs.2019.10024369

Kalogiannakis, M., Papadakis, S., and Zourmpakis, A. (2021). Gamification in science education. A systematic review of the literature. *Educ. Sci.* 11, 1–36.

Kapp, K. (2012). *The gamification of learning and instruction: Game-based methods and strategies for training and education.* Germany: Pfeiffer.

Kim, S., Song, K., Lockee, B., and Burton, J. (2018). "What is Gamification in Learning and Education?," in *Gamification in Learning and Education*, M. Laskowski, and A. Wojdyga, (Nehterland: Springer), doi: 10.1007/978-3-319-47283-6

Kohnke, L., and Moorhouse, B. L. (2021). Using Kahoot! to gamify learning in the language classroom. *RELC J.* 10, 1–7. doi: 10.1177/00336882211040270

Licorish, S. A., Owen, H. E., Daniel, B., and George, J. L. (2018). Students' perception of Kahoot!'s influence on teaching and learning. *Res. Pract. Technol. Enhanc. Learn.* 13:9. doi: 10.1186/s41039-018-0078-8

Lin, Y. C. (2009). *The effects of visual aids and text types on listening comprehension.* Taiwan: National Taiwan Normal University.

Linnenbrink, E. A., and Pintrich, P. R. (2003). The role of self-effcacy beliefs in student engagement and learning. *Read. Writ. Q.* 19, 119–137.

Little, D. (2002). *Learner autonomy and second/foreign language learning.* Taiwan: Subject Centre for Languages.

Lutz, M. E., and Culver, S. (2010). The national survey of student engagement: A university-level analysis. *Tert. Educ. Manag.* 16, 35–44. doi: 10.1080/13583881003629814

Martín-Sómer, M., Moreira, J., and Casado, C. (2021). Use of Kahoot! to keep students' motivation during online classes in the lockdown period caused by Covid 19. *Educ. Chem. Eng.* 36, 154–159. doi: 10.1016/j.ece.2021.05.005

Mayer, R. E. (2015). On the need for research evidence to guide the design of computer games for learning. *Educ. Psychol.* 50, 349–353. doi: 10.1080/00461520.2015.1133307

Moore, M. G. (1989). Three types of interaction. *Am. J. Dist. Educ.* 3, 1–7.

Moore, M. G. (2013). *Handbook of Distance Education* (third edit). Nehterland: Routledge.

Muntean, C. I. (2011). Raising engagement in e-learning through gamification. *Proc. Int. Conf. Virt. Learn.* 1, 323–329.

Paivio, A. (1986). *Mental representations: A dual coding approach.* Oxford: Oxford University Press.

Papadakis, S., and Kalogiannakis, M. (2018). "Using gamification for supporting an introductory programming course. The case of ClassCraft in a secondary education classroom," in *Interactivity, Game Creation, Design, Learning, and Innovation. ArtsIT 2017, DLI 2017. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering*, Vol. 229, eds A. Brooks, E. Brooks, and N. Vidakis (Springer), 366–375. doi: 10.1007/978-3-319-76908-0_35

Papadakis, S., Trampas, A. M., Barianos, A. K., Kalogiannakis, M., and Vidakis, N. (2020). Evaluating the learning process: The "ThimelEdu" educational game case study. *Proc. Int. Conf. Comput. Supp. Educ.* 2, 290–298. doi: 10.5220/0009379902900298

Plump, C. M., and LaRosa, J. (2017). Using Kahoot! in the Classroom to Create Engagement and Active Learning: A Game-Based Technology Solution for eLearning Novices. *Manag. Teach. Rev.* 2, 151–158. doi: 10.1177/2379298116689783

Rivera, E. S., and Garden, C. L. P. (2021). Gamification for student engagement: A framework. *J. Furth. High. Educ.* 45, 999–1012. doi: 10.1080/0309877X.2021.1875201

Rojabi, A. R., Setiawan, S., Munir, A., Purwati, O., and Widyastuti. (2022). The Camera-on or Camera-off, Is It a Dilemma? Sparking Engagement, Motivation, and Autonomy Through Microsoft Teams Videoconferencing. *Int. J. Emerg. Technol. Learn.* 17, 174–189. doi: 10.3991/ijet.v17i11.29061

Ruiz, C. G. (2021). The effect of integrating Kahoot! and peer instruction in the Spanish flipped classroom: the student perspective. *J. Span. Lang. Teach.* 8, 63–78. doi: 10.1080/23247797.2021.1913832

Ryan, R. M., and Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am. Psychol.* 55, 68–78. doi: 10.4324/9780429052675-23

Stuart Webb. (2008). The effects of context on incidental vocabulary learning. *Read. Foreign Lang.* 20, 232–245.

Sun, J. C. Y., and Rueda, R. (2012). Situational interest, computer self-efficacy and self-regulation: Their impact on student engagement in distance education. *Br. J. Educ. Technol.* 43, 191–204. doi: 10.1111/j.1467-8535.2010.01157.x

Tomas, L., Lasen, M., Field, E., and Skamp, K. (2015). Promoting online students' engagement and learning in science and sustainability preservice teacher education. *Austr. J. Teach. Educ.* 40, 78–107. doi: 10.14221/ajte.2015v40n11.5

Tsai, Y. L., and Tsai, C. C. (2018). Digital game-based second-language vocabulary learning and conditions of research designs: A meta-analysis

study. *Comput. Educ.* 125, 345–357. doi: 10.1016/j.compedu.2018.06.020

Tseng, W., Liou, H., and Chu, H. (2020). Vocabulary learning in virtual environments: Learner autonomy and collaboration. *System* 12:102190. doi: 10.1016/j.system.2019.102190

Wang, S., and Vasquez, C. (2012). Web 2.0 and Second Language Learning: What Does the Research Tell Us? *CALICO J.* 29, 412–430. doi: 10.11139/cj.29.3.412-430

Wichadee, S., and Pattanapichet, F. (2018). Enhancement of performance and motivation through application of digital games in an English language class. *Teach. Engl. Technol.* 18, 77–92.

Woodard, R., and Mabry, J. (2018). Give and receive immediate feedback and kickstart discussions with Kahoot!: A successful classroom teaching tactic that can be replicated by other instructors. *Teach. Theol. Relig.* 21:303. doi: 10.1111/teth.12457

Xezonaki, A. (2022). Gamification in preschool science education. *Adv. Mob. Learn. Educ. Res.* 2, 308–320. doi: 10.25082/amler.2022.02.001