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## Declaration

I, Tang Yuet Man declare that this research report represents my own work under the supervision of Dr. Cheng Wai Lun Eddie, and that it has not been submitted previously for examination to any tertiary institution.

Signed

Student Name Tang Yuet Man

Date 18/04/2023

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## Abstract

The internet and information technologies have revolutionized how we teach and learn in general, changing everything from teaching techniques to delivering classes and exams. The majority of educational institutions all across the world choose online instruction, particularly in light of the social isolation brought on by the Covid-19 epidemic. It is not necessary for teachers and students to physically attend school or a class; instead, they are free to do so at home, in distant areas, or wherever else that is suitable for their needs and safe for their health. The aim of this study is to investigate how as Kahoot! a gamification platform affects students' learning goals as measured by their engagement, motivation and enjoyment. In this study, a mixed-method approach was used to determine the impact of using Kahoot! in business classes. A questionnaire was distributed (N=100) to examine their motivation, engagement and enjoyment toward using Kahoot! in business lessons in which five students who completed the questionnaire were invited to participate in the interview, so as to identify the engagement, motivation and enjoyment in using Kahoot!. The major findings revealed that students tended to hold more engagement, motivation and enjoyment in business lessons with Kahoot!.

**Keywords:** Gamification, Kahoot!, Motivation, Engagement, Enjoyment, Game-based learning

## 1. Introduction

The Covid-19 epidemic has caused problems in education, especially when it comes to quickly establishing online learning. There has been a significant boost in the use of digital technology applications to address this issue. Learning using digital media is seen as a novel strategy intended to inspire students to pursue learning outside of the conventional face-to-face classroom setting. Gamification is becoming more popular as a teaching tool in online classrooms (Hernández, 2020). As a result, the marriage of gamification with contemporary technology seems to provide educators fresh chances for teaching and learning, which are already frequently regarded as sources of innovation. These systems have demonstrated to be effective methods for raising students' comprehension, interest, motivation, and involvement (Kimet et al., 2017; Rabahet et al., 2018; Werbach, Kevin, 2012). However, for gamification to be a successful instructional strategy, it frequently needs a system or a platform. The following introduces one such platform.

The development of gamified platforms throughout time resulted in the development of Kahoot!, one of the most effective and user-friendly online game-based platforms

for e-quizzes (Goshevski et al. 2017). Kahoot! has gained popularity among instructors and students due to its simplicity of use and ability to foster an active learning environment (Rodriguez, 2017). In the first quarter of 2020, Rodriguez asserted a threefold increase in participants and a fivefold increase in asynchronous learning. This well-known free online learning platform, which has more than 30 million users globally, was created using modern user-centered and behavioral design principles.

Since the platform's launch in 2013, many studies have been conducted on the effects of using Kahoot! in learning in different countries, including Greece, India, Turkey, Canada, etc. However, there is no systematic analysis of the effectiveness of using Kahoot! in business lessons and very few of the existing studies are done in Hong Kong which filling the research gap of the existing literature. A rising interest in utilizing technology in a variety of educational situations is being fueled by the development of information technology. It is unavoidable for teachers to instruct in using digital technology. Since the impact is so fundamental to Kahoot!, it is crucial to examine the impact of the gamification platform Kahoot!. The aim of this study is to see how effective Kahoot! is in support of learning business subjects in terms of students' enjoyment, engagement and motivation. And its effectiveness is measured through enjoyment, engagement and motivation. The literature review and mixed-method approach looks into whether if Kahoot! affects the enjoyment, engagement and motivation of students.

The research focuses on answering the following questions:

1. How does Kahoot! affect students' enjoyment in business classes?
2. How does Kahoot! affect students' engagement in business classes?
3. How does Kahoot! affect students' motivation to learn in business classes?

## **2. Literature Review**

### **2.1 Kahoot! Description**

With the teachers serving as the presenter and the students serving as competitors, Kahoot! is a game-based student response system that transforms the classroom into a game show (Wang, 2015). At the Norwegian University of Science and Technology, the platform is the end product of a research project which started in 2007 and entailed the creation and assessment of several prototypes over a number of years. According to trials with early prototypes, Lecture Quiz increased students' attention, engagement, and perceived learning through enjoyable social learning activities (Wu, Wang, Brresen, & Tidemann, 2011). Based on Lecture Quiz, a start-up company

called Kahoot! was established in the fall of 2012 with the goal of building a brand-new game-based student response system. Kahoot! unveiled as a game-based learning platform in September 2013.

Teachers must first sign up for a free account on Kahoot! before using it. Then they have the option of creating an interactive quiz or choosing from a collection of publicly accessible questions. Multiple-choice questions with two to four possible answers and prompts with text or graphics are both common in quizzes. Depending on the complexity or student variables, the instructor can choose a suitable reaction time for each question (from 5 seconds to 4 minutes) (Appendix 1). A unique PIN can be used to invite students to take a quiz once it has been produced and stored, either in-person during class, or remotely using a device with internet access. The two game modes that Kahoot! offers—team vs team and player versus player—allow teachers to assess whether their students may benefit from peer help. The option of "hosting live" by which all students respond to the questions simultaneously on their own devices while competing with one another for points is also available to instructors. In "ghost mode," students may even be required to compete against themselves (Appendix 2), which is a great chance for students to review prior information.

## **2.2 Game-based Student Response Systems (GSRs)**

Over the past several years, there has been a significant growth in the usage of student response systems, and academics have been paying more attention to how these systems affect student's engagement and learning (Aljaloud, Gromik, Billingsley, Kwan, 2015). To create what Prensky (2005) refers to as " Game-based student response systems (GSRs)," the entertainment, motivation, enjoyment and engagement of games may be incorporated into the content of the curriculum. Moreover, studies have shown that game-based learning settings encourage greater student self-confidence, making them more motivating and engaging than standard non-game-based training. Studies by Jackson et al. (2012) and Papastergiou (2009) compared game-based activities or tools to those that weren't based on games. Software for reading comprehension that incorporates games was compared to equivalent non-game-based software by Jackson et al. (2012). Their study, that involved 36 university students from an EFL context, revealed that the game-based method generated higher levels of engagement yet produced superior learning results.

An example of a gamification technique is the use of GSRs to promote learning enjoyment and engagement while students are studying. When implementing game-based student response systems in the form of gamification, students must engage

prior knowledge and evaluate their performance as they play and study the subject (Plump & LaRosa, 2017). Where conventional tactics might not be able to reach the same degree of learning, GSRs go above and beyond standard methods to boost students' attention, motivation, engagement and enjoyment (Wang and Lieberoth, 2016). Additionally, they pique the interest of students who would not often contribute to class debates individually (Wang, 2015). As a result, it inspired educators to include gamification into their lesson plans.

### **2.3 GSRs' Relationship with Learning Motivation, Engagement and Enjoyment**

According to Chen et al. (2005), engagement and motivation are essential for learning. For measuring a student's comprehension and application of knowledge, routine examinations and evaluations are no longer enough. In order to guarantee that students have a better comprehension of what they are learning and can effectively use those abilities in their everyday lives, traditional educational evaluation methodologies have recently begun to incorporate the usage of high-tech applications and online platforms. Gamlo (2019) further confirmed that learners may need engagement and motivation to go beyond obstacles to a deeper understanding of learning. Games have been cited as one of the most significant factors in the development of interactive, motivating, and engaging learning environments during this change. Also, Rowe et al. (2011) claimed that incorporating gaming elements into learning settings is another method for boosting motivation and engagement. The venues offered by GSRs offer a tremendous potential to increase student's involvement and motivation. According to Shaffer (2006), GSRs provide a range of strategies for inspiring and engrossing students right once and over the course of several interactions. Smith (2011) said that the goal of the GSR method was to promote similar behaviors while increasing student engagement in classroom activities. Therefore, teachers are increasingly accepting of the use of GSRs to boost students' motivation, engagement, and enjoyment (Bergtrom, 2006; Habel and Stubbs, 2014; Duncan, 2005; Fies and Marshall, 2006; Simpson and Oliver, 2007).

### **2.4 Motivation**

According to Meece (2006), motivation in school learning entails arousing, enduring, maintaining, and guiding desired behavior. It is the state of the individual which disposes him to particular activity for obtaining objective. The motivation of students may be greatly increased by using game-based learning. It was discovered that using video or computer games in the classroom increased student interest and flow (Sera & Wheeler, 2017). Players will feel psychologically happy when they win a game. Games also frequently provide players the ability to collaborate or compete with one

another. Students might take motivation in the game and social connections throughout this process of competition or collaboration while learning the information and abilities which other players in the game employ (Sweetser & Wyeth, 2005). Factors sparking the motivation of players, like cooperation and competition, are produced from interaction processes and help to increase the learner's initiative drive (Kiili, 2005). Kahoot! is an example of a new generation of GSRs which places a strong emphasis on gamification to motivate and engage students. Early prototypes were tested, and the findings indicated that they boosted engagement, motivation and perceived learning (Wang, 2015).

## **2.5 Engagement**

The Lexicon of Education Reform states that student engagement defined as the level of focus, curiosity, interest, optimism, and zeal which students exhibit when learning or being taught. Additionally, it takes into account how motivated they are to learn and advance their education. Researchers have started to fill out engagement surveys from the viewpoint of the student. Harper and Quaye (2009) emphasize that engagement is more than only partaking in a practice and is also accompanied by a variety of sentiments around those activities and an effort to make meaning of the activity. According to Papastergiou (2009), students were more engaged to participate in game-based activities than non-game activities. When playing Kahoot!, undergraduate business students' responses to questions on their degree of interest in class were reported by Plump and LaRosa (2017). In this research, it provides an overview of how Kahoot might be used to boost student engagement, taking into account how such engagement emerges as the exercise of agency in predetermined learning contexts. According to the study's findings, this online platform encouraged pupils to be more engaged and competitive. The total number of right answers and the amount of time it took to answer each question determine the greater or lower number of points awarded. As it fosters a dynamic and competitive atmosphere in which students actively participate, it raises students' engagement, motivation, and aspirations for success.

## **2.6 Enjoyment**

A state of enjoyment is one of emotional or psychological contentment (Kuppens, 2008). The delight of learning has a solid conceptual framework that is self-explanatory. According to Scanlan and Simmons (1998), enjoyment is a positive affect that reflects universal emotions like pleasure, liking, and fun. Therefore, enjoyment has been defined as a multidimensional structure linked to fervor, cognitions and excitement like perceptions of competence and attitude toward the



activity. One of the Gamification elements is enjoyment, aiming to make its users happy so they may sense delight when utilizing the technology. Online games have emerged as the teaching method that best provides students with a form of enjoyment while boosting the degree of immersion (Ampatzoglou & Chatzigeorgiou, 2007; Virou, Katsionis, & Manos, 2005). Moreover, Hartley (2006) makes a case for the emotional component of learning delight. The idea refers to how a subject feels, not what they are thinking. It found that Kahoot! can increase their enjoyment of classroom activities.

As the result, the research on GSRs demonstrates that they have a positive effect on learning as a consequence. Game components including points, music effects, time restrictions, leaderboards and nicknames are all included in Kahoot! (Wang, 2015). Numerous empirical researches have demonstrated how GSRs devices may help students improve their motivation, engagement and enjoyment. Additional evidence for the benefits of a gamified approach employing tools like Kahoot! is provided by Panagiotis, Theodoros, Leinfellner, and Yasmine (2016) in their examination of the impact of GSRs on the learning experience, students' performance and motivation.

### **3. Research Methodology**

#### **3.1 Participant Information**

In this study, purposive sampling was employed to select participants for both quantitative and qualitative research, which is based on the mixed methods research. In this study, participants were 100 business students from several universities. In the first part, it provided a convenience sampling survey for the 100 business students. A large population can make it simpler to extract an accurate representation. Five business students, aged 20-22 including three female students and two male students, were chosen to have an interview and all returned their signed consent forms (Appendix 6) in the second part. Ethical clearance by the university was obtained.

#### **3.2 Quantitative Research**

A questionnaire examining students' views was employed to obtain quantitative data in the first part. This questionnaire is a modified version of the academic publication by Rodríguez (2017) and the study paper by Plump and LaRosa (2017). The data from the completed questionnaires served as the basis for the quantitative analysis employed in the study. There are three primary areas in the questionnaire assessing the enjoyment, engagement and motivation of students.

Part A asked about demographic characteristics, which contained 3 questions collecting business students' demographic information, including gender, age group and education level. Part B asked about attitudes toward the impact of not using and using Kahoot! in business classes, which consisted of 14 questions related to motivation, engagement and enjoyment. Students were required to respond to each statement with the 5-point Likert Scale (1: Strongly Disagree; 2: Disagree; 3: neither agree nor disagree; 4: Agree; 5: Strongly Agree) (Appendix 3). Part C asked about students' strategies and recommendations in using Kahoot! for their business lessons, which consisted of 1 question related to the strategies students thought would benefit them in using Kahoot! and 1 open-ended question about their recommendations in using Kahoot!. Given that Chinese is the participants in this study's primary language, the questionnaire was designed in Chinese to satisfy their reading comprehension needs and prevent confusion regarding the questions as a result of the translation process from English to Chinese.

Besides the descriptive analysis of the questions regarding the participants' background data, independent-samples t-test was used for analyzing the quantitative data about the impacts of attitudes among gender of using Kahoot! in business lesson of the respondents. Moreover, the paired-samples t-test was carried out to compare scores between three different pre- and post-test pairs to determine if engagement, motivation, and enjoyment were improved due to Kahoot!. All analyses were performed by Statistical Program for Social Sciences (SPSS) 24.0.

### **3.3 Qualitative Research**

Seidman (2013) asserted that using a qualitative interviewing approach tries to comprehend the individual experience through the interaction between the interviewer and the interviewee. Thus, this investigation provided detailed information. With reference to Patton (2002), an interview guide (Appendix 4) was created, and the majority of the interview questions were open-ended, so as to allow respondents to share their own opinions.

An in-depth interview examining students' views was used to collect qualitative data in the second part. In order to gather more information of the impact on using Kahoot! in business classes, five students were chosen to participate in the interview. There were five questions that focused on motivation, engagement and enjoyment in using Kahoot! and the recommendations and suggestions in business lessons with using Kahoot!. These five in-depth questions were used to gain a better understanding that would be used in the questionnaire while answering the research questions. The

interview results would be used to do a qualitative analysis. All interviews were audio-recorded and all the information would be used for academic purposes only. Their personal information would be anonymous to protect their privacy.

### **3.4 Data Analysis Procedures of Qualitative Analysis**

This study used content analysis to see whether there were any evident themes in the data related to students' enjoyment, motivation and engagement (Patton, 1990). After becoming comfortable with the interviews, first codes were created based on clear, surface-level interpretations in the data instead of implicit replies and assumptions (Braun and Clarke, 2006). Axial coding was used to reassemble codes and create relationships between ideas. Then, unique codes were grouped into larger themes using thematic mapping. The resulting themes were finally polished and organized into a coherent, internally consistent account using Braun and Clarke's (2006) selective coding technique, and a narrative (or "story") was created to go along with each topic. Before the surveys and the interview, each participant had to sign a permission form. After the interview, which required audio recording with the participants' consent, a transcription was created. Answers to interview questions about students' engagement, motivation and enjoyment were utilized to create themes. The three research questions were addressed using the findings.

## **4. Results**

### **4.1 Quantitative Research Findings**

Table 1 indicates the demographic description of the sample. Each classified element displays the overall number of responders and the corresponding percentage. Due to constraints in budget and time, only 100 completed questionnaires were obtained for this study. Participants included 35 males (35%) and 65 females (65%). The number range of main age group was 18-25, which consisted of 99 participants (99%). The major group of education level was bachelor's degree, containing 95 participants (95%). Two participants (2%) reported that they did not have any experience in using Kahoot! in business lessons but the research results were unaffected as they could still offer their opinions towards the questions in Parts B and C respectively.

**Table 1 Student's Demographic Information**

Characteristics	n	%
1. Gender		
Male	35	35
Female	65	65
2. Age		
18 – 25 years	99	99
26 – 31 years	1	1
32 – 41 years	-	-
42 – 51 years	-	-
52 years or above	-	-
3. Highest Level of Education		
Primary or below	-	-
Secondary	-	-
Sub-degree	4	4
Bachelor's Degree	95	95
Master's Degree or above	1	1
4. Experience in using Kahoot! in business lessons		
Yes	98	98
No	2	2

Chart 1 show the extent to which students like using Kahoot! in business classes. Chart 1 explains that 73% of students strongly agree that they like using Kahoot!. 20% of students agree that they like using Kahoot! and 2% of students disagree that they like using Kahoot! in business lessons. The potential explanation would be discussed in Discussion section.

**Chart 1 Result of Question 17**

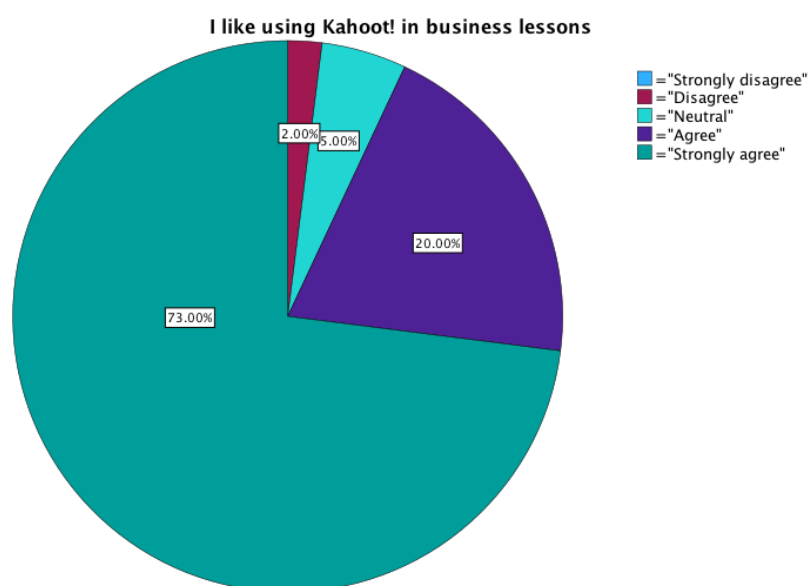


Table 2 describes the gender differences of the levels of motivation, engagement and enjoyment in using Kahoot! in business lessons. An independent-samples t-test was conducted to compare students' motivation, engagement and enjoyment in different gender. The ratings of the female students are slightly higher than those of males, although there are no major differences between the subgroups. In terms of motivation, there was a significant difference between male ( $M = 4.26$ ,  $SD = 0.78$ ) and female ( $M = 4.84$ ,  $SD = 0.36$ ),  $t(98) = -5.035$ , with the p-value smaller than 0.05 ( $p = 0.001 < 0.05$ ). This indicated that female students group has better motivation as their means are higher than those of male students. For the engagement, there was a significant difference between male ( $M = 4.24$ ,  $SD = 0.83$ ) and female ( $M = 4.92$ ,  $SD = 0.23$ ),  $t(98) = -3.464$ , with the p-value smaller than 0.05 ( $p = 0.001 < 0.05$ ). This suggested that female students group has better engagement as their means are higher than those of male students. In terms of the enjoyment, there was a significant difference between male ( $M = 4.48$ ,  $SD = 1.39$ ) and female ( $M = 4.90$ ,  $SD = 0.25$ ),  $t(98) = -2.361$ , with the p-value smaller than 0.05 ( $p = 0.001 < 0.05$ ). This indicated that female students group has better enjoyment as their means are higher than those of male students. Therefore, these results suggest that female students have more motivation, engagement and enjoyment in using Kahoot! than male students.

Table 2 lists the results for answering Research Questions 1, 2 and 3 by employing independent-samples t-test for testing the motivation, engagement and enjoyment. The higher the score, the more the positive impact of Kahoot! on students' engagement, motivation and enjoyment.

Overall, the means from the 3 different categories (motivation, engagement, and enjoyment) ranged from 4.24 to 4.90, reflecting that the impact of using Kahoot! in business lessons effects of students' motivation, engagement and enjoyment tends to be positive, especially enjoyment which scored the highest among 3 categories.

**Table 2 Result of Independent-Samples t-Test**

		Male's mean (SD)	Female's mean (SD)	t	df	p	95% Confidence Interval of the Difference	
						Lower	Upper	
<b>Motivation</b>	<b>Male -</b>	4.26	4.84	-5.035	98	<.001	-0.81	-0.35
	<b>Female</b>	(0.78)	(0.36)					
<b>Engagement</b>	<b>Male -</b>	4.24	4.69	-3.464	98	<.001	-0.76	-0.14
	<b>Female</b>	(0.83)	(0.46)					
<b>Enjoyment</b>	<b>Male -</b>	4.48	4.90	-2.361	98	<.001	-0.85	-0.17
	<b>Female</b>	(1.39)	(0.25)					

In answering 1, 2 and 3 research questions about using Kahoot! in business lesson in improving student's motivation, engagement and enjoyment, results are presented in Table 3. To see if the score difference between used and not used Kahoot! was statistically significant, a paired-samples t-test was conducted, comparing scores between three different pre- and post-test pairs, which are 1) motivation, 2) engagement, and 3) enjoyment.

Table 3 presented the means and standard deviation of all pre- and post-test measures for motivation, engagement and enjoyment. Through the pairwise comparison, a significant difference was found in Pair 1, it indicated that scores were higher for the post-test (M = 4.63, SD = .60) than in the pre-test (M = 1.83, SD = 1.03),  $t(99) = -23.058$ , with the p-value smaller than 0.05 ( $p = 0.001 < 0.05$ ). This indicated that students after using Kahoot! had better motivation than not using Kahoot! in business lessons. Similarly, the paired samples t-test of Pair 2 in its pre-test and post-test performance also indicated that increase in the post-test (M = 4.68, SD = .61) compared with the pre-test (M = 1.86, SD = 1.08),  $t(99) = -24.682$ , with the p-value smaller than 0.05 ( $p = 0.001 < 0.05$ ). This suggested that students using Kahoot! in business lessons had gained better engagement than not using Kahoot!. In Pair 3, it indicated that scores were higher for the post-test (M = 4.75, SD = .86) than in the

pre-test ( $M = 1.80$ ,  $SD = 1.02$ ),  $t(99) = -22.142$ , with the p-value smaller than 0.05 ( $p = 0.001 < 0.05$ ). This indicated that students after using Kahoot! in business lessons had better enjoyment than not using Kahoot!.

As indicated in the table below, the scores of pair 1, 2 and 3 were higher in the post-test than in the pre-test. This shows that use Kahoot! in business lesson was effective to a large extent in improving students' motivation, engagement and enjoyment.

**Table 3 Result of Paired-Samples t-Test**

		Pretest mean (SD)	Posttest mean (SD)	t	df	p	95% Confidence Interval of the Difference	
							Lower	Upper
Pair 1 (motivation)	NotUsed – Used	1.86 (1.03)	4.63 (.60)	-23.058	99	<.001	-3.01	-2.53
Pair 2 (engagement)	NotUsed – Used	1.86 (1.08)	4.68 (.61)	-24.682	99	<.001	-3.05	-2.59
Pair 3 (enjoyment)	NotUsed – Used	1.80 (1.02)	4.75 (.86)	-22.142	99	<.001	-3.22	-2.69

#### 4.2 Qualitative Research Analysis

There were five focused questions (Appendix 4) asked in the one-on-one interview in which five randomly selected students who completed the questionnaire were invited separately. This qualitative data is associated with the Research Questions 1, 2 and 3. It is preferable to group these five interview questions by the three research questions in the actual question list (Table 4) in order to make them easier to grasp. The first three interview questions are associated with Research Questions 1, 2 and 3, helping to explain their views toward the use of Kahoot!. The last two interview questions help to explore more about whether they would recommend the use of Kahoot!. The answers of each question from the five students were then merged to form a script (Appendix 5). 2 male and 3 females; age ranged from 20-22.

**Table 4 Question Categorizations of Interviews and Question List**

Major focus (research question)	Interview questions
1	1,4,5
2	2,4,5
3	3,4,5

Interview Question List (Translated)
1. Do you think that using Kahoot! will enhance your enjoyment in business lessons? Why?
2. Do you think that using Kahoot! will enhance your engagement in business lessons? Why?
3. Do you think that using Kahoot! will enhance your motivation in business lessons? Why?
4. Do you recommend using Kahoot! in business lessons? Why?
5. Do you have any recommendation for using Kahoot! in business lessons?

In question 1, all the interviewees responded that using Kahoot! can improve their enjoyment. Kahoot! was considered as a fun educational tool by students. Student B verified that *“The Kahoot! game was great fun, an easy way to learn, and you could claim you made a mistake because you wanted to be as fast as possible.”* Also, Student D believe that *“Playing Kahoot! created a great feeling of belonging; we were all laughing when somebody pushed the wrong button because of over-excitement.”* Student A stated that *“Yes, it made it more enjoyment. I definitely did have more discussions in terms of the actual content with people around me than I did in other classes”*. Regarding their ideas, they felt that using Kahoot! can offer enjoyable learning experiences and make the business lesson more enjoyable. Even when they messed up, students still enjoyed and learned from Kahoot!. Kahoot! exercises improved group cohesion and provided opportunity for laughter.

In question 2, all the interviewees agreed that using Kahoot! can enhance their engagement. It could let them find activities with Kahoot! games engaging. Student C claimed that *“I am more attentive and focused on an activity if I need to demonstrate its outcome in a Kahoot! team game.”* Student E stated that *“Kahoot! was a fun and engaging game! It created a relaxed atmosphere in the class.”* Also, Student A agree that Kahoot! can improve his engagement: *“I find activities with Kahoot! games engaging.”* Both Kahoot's intriguing features and its capacity to foster a nice, relaxed environment have received acclaim. As a result, Kahoot! gave students the opportunity to push themselves, see their development and receive encouragement.



In question 3, all the interviewees thought that using Kahoot! can enhance their motivation to learn. Students stated that they felt more motivated to take responsibility for their team to win games and improve learning motivation due to the platform's competitive and entertaining nature. Student C stated that *"I am more motivated to do a task if I compete with my peers to get higher scores in Kahoot! games."* Moreover, Student A said that *"The Kahoot! game encouraged me to learn to improve my team achievements."* Student D claimed that *"I feel motivated when I compete with my classmates to get higher scores in Kahoot! game."* It fosters a lively and competitive environment in which students actively engage, which raises students' motivation to study and aspirations for achievement.

In question 4, most of the interviewees recommend using Kahoot! in business lessons. Implementation of Kahoot! games is an effective and beneficial practice in business lessons. Student B stated that *"I feel positive towards my learning when I participate in Kahoot! games."* Also, Student E said that *"Playing the quiz could be of some value to me."* Almost all students had positive feelings and experiences about using Kahoot! in business lessons. Thus, the implemented Kahoot! games had a largely positive effect on the engagement, motivation and enjoyment of students in learning business. Using Kahoot! in business classes did result in a better learning experience for the students.

In question 5, some of the interviewees responded that Kahoot! has the least flexibility in terms of question methods. Student D claimed that *"Kahoot! do not have enough questioning format, such as written feedback function."* Kahoot! only has multiple-choice questions, yes or no questions and true or false questions, which has some limitations on the content of business lessons. For example, some topics that require financial statements are difficult to integrate into Kahoot!. Student suggested that it is better to have open-ended questions in Kahoot!, which allow students to express their opinions through free-form responses, which might take the shape of phrases, recordings, or tales, and which are informational in nature, rather than provided to students to choose their answers.

Also, several students noted the obstacles to access to and technical help for technology. Some technical issues such as *"Wi-Fi stability (Student A)"* and *"Hardware support (Student B)"* were their concerns of using technology in their learning. Student C stated that *"The limitation of playing Kahoot! is only the internet. Means that if the internet is slow then it will be difficult for me to click on the answer."*

*Hence, I lost the game.*” Moreover, Student E said that *“just the internet connection affects my mood to play Kahoot!.”* For example, If the majority of students are using the same network, this might occasionally lead to issues due to congestion. Therefore, students being challenged to participate in the Kahoot! sessions despite certain limitations which are the internet connectivity issues and least flexibility in terms of question methods.

## **5. Discussion**

The three research questions posed in Chapter 3 were ultimately addressed by this study's numerous tidbits of data.

### **5.1 Research question 1: How does Kahoot! affect students' enjoyment in business classes?**

The results of the independent-samples t-test in this study revealed that using Kahoot! in business lessons helped both male and female students increase their enjoyment more effectively and successfully. Also, the results of the paired-samples t-test in this study indicates that those used Kahoot! rated enjoyment significantly higher than those did not play Kahoot!. In other words, students using Kahoot! had significantly higher enjoyment than learners who did not use Kahoot!. According to the interview, all the students agreed that using Kahoot! can enhance their enjoyment in business lessons and rated Kahoot! as a fun educational tool. They still enjoyed and learned from Kahoot! even when they messed up. Kahoot! sessions improved communal sentiments and provided opportunity for laughter.

Furthermore, the quantitative and qualitative findings of this study generally support the previous studies that demonstrate that Kahoot! creates the game-like learning environment that learners enjoy (Dellos, 2015; Wang & Lieberoth, 2016; Zarzycka-Piskorz, 2016). It appears that Kahoot!'s competitive nature and amusing design (visual and sound effects) have a positive impact on the classroom dynamics and students' enjoyment. Utilizing gamification mechanisms, this game-based learning platform creates an enthusiastic and supportive atmosphere. Numerous articles claim that the majority of students perceived that Kahoot! boosted students' enjoyment in the lesson (Ismail & Fakri, 2017; Ismail & Ibrahim, 2018). Therefore, Kahoot! had a more positive impact on the enjoyment of students. Students participating in the Kahoot! gamified lessons were interested and enjoyed in completing the tasks, scoring points for their team.

### **5.2 Research question 2: How does Kahoot! affect students' engagement in business classes?**

The results of the independent-samples t-test in this study revealed that using Kahoot! in business lessons helped both male and female students increase their engagement more effectively and successfully. It is not only the independent-samples t-test shows that the impact of using Kahoot! in business lessons effects of students' engagement tends to be positive, but also the paired-samples t-test indicates that those used Kahoot! rated engagement significantly higher than those did not play Kahoot!. Also, from the interview it can be indicated that Kahoot! fosters an engaging and competitive atmosphere in which students actively participate, which boosts students' engagement to study and aspirations for achievement. The total number of right answers and the amount of time it took to answer each question determine the greater or lower number of points awarded.

With reference to the research conducted by Wang (2015), Kahoot! boost student engagement levels. This outcome explained by claiming that employing Kahoot! fosters a game-like environment and increases student attentiveness. This finding was supported by the view of Smith & Brauer (2018) that Kahoot! lead to better student' engagement. Students may set goals for themselves, see their progress visually and receive encouraging feedback through Kahoot!. Also, Kahoot! can included into a conventional classroom lecture to boost engagement (Wang et al., 2015). In short, the results of this study concluded that Kahoot! encouraged students to be more engaged and competitive. Kahoot! was highly regarded as entertaining and as a flexible tool to promote engagement and learning.

### **5.3 Research question 3: How does Kahoot! affect students' motivation in business classes?**

The results of the independent-samples t-test in this study revealed that using Kahoot! in business lessons helped both male and female students increase their motivation more effectively and successfully. Moreover, the results of the paired-samples t-test in this study indicates that students using Kahoot! had significantly higher motivation than learners who did not use Kahoot!. According to the interview results, it was found that in students' opinion activities that involve Kahoot! quizzes are considered effective for learning business as well as contributing to their learning and boosting their motivation. Also, students stated that they felt more motivated to take responsibility for their team to win games. In the interview, participants agreed that using Kahoot! in business classes can enhance learning motivation due to the platform's competitive and entertaining nature.

It was found out as a result of this study that the motivation level of the students who used Kahoot! are higher compared to that of the students who did not using Kahoot!. Parallel to that finding, when compared to paper forms or straightforward non-game-based student response systems, students utilizing game-based systems were more focused and motivated (Wang et al., 2015). Moreover, different studies investigated and supported the use of Kahoot! in enhancing the motivation of students and promoting relevant learning experiences (Bicen and Kocakoyun, 2018). Overall, the findings of the study confirm the motivation of using the Kahoot! platform as an instructional supplement in business lessons. It is clear that students who participated in business lessons with Kahoot! reached a higher level of motivation.

#### **5.4 Female Students Have Higher Engagement, Motivation and Enjoyment in Using Kahoot!**

The majority of researches have looked into the inequalities in gender among computer game players. For instance, Chou and Tsai (2007) investigated the gender disparities among Taiwanese high school students who played video games and discovered that females displayed a greater enjoyment and were more highly motivated of video games by than males. The preferences of men and women for game-based learning environments also differed; for instance, men favored narratology while women preferred ludology (Inal & Cagiltay, 2007). The results of the independent-samples t-test in this study showed that the enjoyment, motivation and engagement of using Kahoot! in business lessons are higher in female students than in male students. It found that there were differences between females and male of engagement, motivation and enjoyment in using Kahoot! in business lessons.

In recent years, it has been discovered that women play games more often (Prensky, 2003). As a result, the influence of gender on game-based learning may provide different findings in the current generation than in the past. Researchers may learn more about how gender affects motivation and cognition in game-based environments by examining gender disparities. Female users of Kahoot! are more prevalent because they are more engaged in the gaming and game-based learning environments. Aside from that, females exhibited significantly more enjoyment, motivation and engagement in using Kahoot!. It can thus be concluded that in this study, Kahoot! can be more enjoyment, motivation and engagement for female students.

## **6. Limitations and Further Research**

The main limitations in the present study is the sampling size. The sample size (N=100) and only 5 participants were interviewed in the interview is too small to accurately represent the situation in Hong Kong. It is challenging to evaluate how much the results can be generalized due to the tiny sample size. Therefore, the whole picture of using Kahoot! affect students' enjoyment, motivation and engagement in business lessons need a larger number of participants to reflect.

The major problems that need to be considered in future research is to increase the population size. According to Chander N (2017) claimed that the greater the sample size, the more insightful data, lesser margin of error and higher confidence level. The limitations may provide insight into how future research should be conducted, with a bigger sample size and want to enlist far more possible case studies in theory so that it would have a larger selection to choose from once this study started in earnest and generate findings of higher representation.

## **7. Recommendations and Conclusion**

The recommendations of this study are those related to teacher, Kahoot! and school. Millennial and generation Z learners are excited to use their smart phones, laptops and tablets in the classroom. As technology permeates every part of our lives, educational environments must adapt in accordance with the changing demands of learners as well as their preferred learning styles and tactics. The Kahoot! platform provides a welcoming atmosphere in class, increases the level of energy and fun, and facilitates a positive attitude to learning thank to friendly competition and cooperation. Therefore, teachers should try to complement traditional textbooks with Kahoot!, so as to boost students' engagement, motivation and enjoyment in business lessons.

In terms of the recommendations for Kahoot!, one glaring disadvantages of Kahoot! only provides selected-response questions. This obviously does not allow for students to construct their own responses to articulate their thinking. Higher level thinking questions can still be created by teachers, but the format of the response is still a selected response. As there are only so many characters in Kahoot!, lengthier questions cannot be created. So that it has to compose a brief question for each item. Therefore, Kahoot! can provide more question methods, which may be in the form of sentences, records, and stories, rather than provided to students to choose their answers.

In the interview, the students did mention several of Kahoot!'s drawbacks, specifically the problem with the Wi-Fi connection. Their replies to the exam questions appeared to have been hampered by the unstable Internet connection. As a result, schools' IT staff members should routinely verify their hardware and software. Maintaining Wi-Fi reliability is crucial in particular because many e-learning strategies demand Internet connection. Additionally, technicians could prepare a number of mobile data-based Wi-Fi routers that are portable. When the school's Wi-Fi network is unreliable during class, using these routers might serve as a fallback option for Internet access.

To conclude, the present study has investigated the impacts of using Kahoot! on students' enjoyment, motivation and engagement in business lessons. Gamification mechanisms that Kahoot! employs appear to be effective for increasing students' motivation, engagement and enjoyment which are beneficial for business learning. In addition to developing engaging and original courses, Kahoot! also keeps track of students' progress using tests and questionnaires. Kahoot!'s interactive elements increase students' motivation, engagement and enjoyment. Teachers should aim to use Kahoot! as a teaching tool in their business courses since it may improve the learning environment for students. It proved to be an efficient and useful tool when teaching in business classes.

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# Appendices

## Appendix 1: Quiz Options

(a) Media options: Image library, Upload image, YouTube link, Add media

(b) Answer options: Single select (selected), Multi-select

(c) Points: Standard (selected), Double points, No points

(d) Time limit: 20 seconds (selected), 5 seconds, 10 seconds, 30 seconds, 1 minute, 1 minute 30 seconds, 2 minutes, 4 minutes

(e) Question type: Quiz (selected), True or false, Type answer, Puzzle, Poll, Word cloud, Open-ended, Brainstorm, Slide

## Appendix 2: Game Modes

### Choose a way to play this kahoot

**Teach**

Play a live game together with learners over video or in class

**Assign**

Assign a challenge game to learners who play it at their own pace

Start a single-player game with virtual players

[Practice](#)

### Appendix 3: Questionnaire Questions in Chinese

#### 《Kahoot! 輔助教學融入商科課程之影響的問卷調查》

您好，我是香港教育大學五年級學生，現正進行畢業專題研習，題目為『有關 Kahoot! 輔助教學融入商科課程之影響』，希望您能抽空完成問卷，提供相關資料。所有資料只作是次研究用途，絕對保密。

每一題答案均從『完全不同意』至『非常同意』，請根據題目的敘述從選項中選擇一個最符合你的實際狀況

1. 請問您屬於以下哪個年齡層？

18 - 25                  26 - 31                  32 - 41                  42 - 51                  52 歲或以上

2. 您的性別是？

男性    女性

3. 請問您的教育程度是甚麼？

小學程度或以下    中學程度                  專上非學士生    學士學位                  碩士學位或以上

#### 第一部分：對於過去上過的商科課堂發表看法

在第一部分，我們希望了解您對沒有使用 Kahoot! 的商科課堂的看法及取態。

4. 您有沒有在商科課堂上使用過 Kahoot! ？

有    沒有

5. 在沒有使用 Kahoot! 的商科課堂，我仍然覺得上課是一件快樂的事。

完全不同意    不同意                  無意見                  同意                  非常同意

6. 在沒有使用 Kahoot! 的商科課堂，我仍然樂意參與老師要我們進行的活動。

完全不同意    不同意                  無意見                  同意                  非常同意

7. 在沒有使用 Kahoot! 的商科課堂，我上課時仍然會保持集中注意力。

完全不同意    不同意                  無意見                  同意                  非常同意

#### 第二部份：融入 Kahoot!於教學之成效

在第二部分，我們希望了解您對於商科課堂使用 Kahoot! 的看法。

8. 商科課堂上使用 Kahoot! 輔助教學能有助於我注意力的集中。

完全不同意    不同意                  無意見                  同意                  非常同意

9. 商科課堂上使用 Kahoot! 輔助教學能引起我對學習內容求知慾望。  
完全不同意      不同意      無意見      同意      非常同意
10. 商科課堂上使用 Kahoot! 輔助教學能激勵學習。  
完全不同意      不同意      無意見      同意      非常同意
11. 商科課堂上使用 Kahoot! 輔助教學能鼓勵我積極參與課堂活動。  
完全不同意      不同意      無意見      同意      非常同意
12. 商科課堂上使用 Kahoot! 輔助教學能讓我更投入上課學習。  
完全不同意      不同意      無意見      同意      非常同意
13. 商科課堂上使用 Kahoot! 輔助教學能引起我的學習興趣。  
完全不同意      不同意      無意見      同意      非常同意
14. 我很享受在商科課堂上使用 Kahoot! 輔助教學學習。  
完全不同意      不同意      無意見      同意      非常同意
15. 商科課堂上使用 Kahoot 輔助教學讓我覺得商科課程變得更有興趣。  
完全不同意      不同意      無意見      同意      非常同意
16. 商科課堂上使用 Kahoot 輔助教學使我更快樂學習。  
完全不同意      不同意      無意見      同意      非常同意
17. 整體而言，我喜歡商科課堂上用 Kahoot 融入教學這種教學方式。  
完全不同意      不同意      無意見      同意      非常同意

#### Appendix 4: Interview Guide

The in-depth interview will consist of FIVE questions.

1. Do you think that using Kahoot! will enhance your enjoyment in business lessons?  
Why?
2. Do you think that using Kahoot! will enhance your engagement in business lessons?  
Why?
3. Do you think that using Kahoot! will enhance your motivation in business lessons?  
Why?
4. Do you recommend using Kahoot! in business lessons? Why?
5. Do you have any recommendation for using Kahoot! in business lessons?

\*Interview content will be audio-recorded with the consent of the interviewee.

## Appendix 5: Interview Script

1. Do you think that using Kahoot! will enhance your enjoyment in business lessons?

Why?

Student A: Yes, it made it more enjoyment. In comparison to prior classes, I did have more talks with others nearby about the material.

Student B: The Kahoot! game was a lot of fun, a simple method to learn, and you could say you rushed things and made a mistake.

Student C: I was taken aback by how effective and enjoyable Kahoot! is for business education. I'll utilize it both during and after the course.

Student D: We had a terrific sense of community while playing Kahoot!, and we all laughed when someone accidentally hit the wrong button out of enthusiasm.

Student E: I was thrilled by Kahoot! and it was great that we could work in team to finish the test.

2. Do you think that using Kahoot! will enhance your engagement in business lessons?

Why?

Student A: Yes, Kahoot! can improve my engagement and I find activities with Kahoot! games engaging.

Student B: It's great that the Kahoot! quizzes are relevant to the reading we just finished.

Student C: I am more attentive and focused on an activity if I need to demonstrate its outcome in a Kahoot! team game.

Student D: Yes, Kahoot! can enhance my engagement and the tests in Kahoot! were educational.

Student E: It was entertaining and exciting to play Kahoot! It made the classroom atmosphere more laid-back. I can play Kahoot every time!

3. Do you think that using Kahoot! will enhance your motivation in business lessons?

Why?

Student A: The Kahoot! game encouraged me to learn to improve my team achievements.

Student B: Yes, since it fosters a challenging and competitive atmosphere, Kahoot! increase

my desire to study and their aspirations for achievement.

Student C: I am more motivated to do a task if I compete with the peers to get higher scores in Kahoot! games.

Student D: Yes, I become inspired when I compete with my classmates in the Kahoot! game to earn higher scores.

Student E: When I use Kahoot! quizzes to earn points and for educational goals, I feel more driven in class.

4. Do you recommend using Kahoot! in business lessons? Why?

Student A: Yes, I recommend using Kahoot! in business lessons. It is because I believe Kahoot! can aid in my business education.

Student B: I recommend using Kahoot! in business lessons, as my attitude toward learning is favorable when I play Kahoot! games.

Student C: Yes, I think that Kahoot! can make it easier for me to efficiently get business knowledge.

Student D: I recommend using Kahoot! in business lessons. It is because I believe Kahoot! will be useful to me as I learn the material in this core unit.

Student E: Yes, I recommend using Kahoot! in business lessons as I think that I could get anything by taking the quiz.

Do you have any recommendation for using Kahoot! in business lessons?

Student A: I think the barriers for using Kahoot! is the technical support, such as Wi-Fi stability.

Student B: Some students may do not have their own iPads, I think schools can reserving computer facilities in school for students' e-learning in the lesson.

Student C: Playing Kahoot! has just an online restriction. This means that it will be challenging for me to click on the solution if the internet is sluggish. Thus, I dropped the match.

Student D: I think Kahoot! do not have enough questioning format, such as written feedback function. It only has multiple-choice questions, yes or no questions and true or false questions, which has some limitations on the content of business lessons. It is better to has open-ended questions in Kahoot!, which are instructive in nature and gives us the opportunity to express our opinions through freestyle responses that might take the shape of statements, facts, or anecdotes.

Student E: My ability to play Kahoot! is only affected by my internet connection. For instance, if the majority of students are linked to the same network, this might occasionally lead to issues due to congestion.



Appendix 6: Consent Form (To Individual)  
**The Education University of Hong Kong**

**Department of Special Education and Counseling**

**Consent to Participate in Research (For Individual)**

**The impact on using Kahoot! on business education**

I \_\_\_\_\_ hereby consent to participate in the captioned research supervised by Dr. Cheng Wai Lun Eddie, Assistant Professor of Department of Faculty of Liberal Arts and Social Sciences and conducted by Tang Yuet Man Mimi, a year-5 undergraduate from Bachelor of Education (Honours) (Business, Accounting and Financial Studies) (Five-year Full-time) in the Education University of Hong Kong.

I understand that information obtained from this research may be used in future research and may be published. However, my right to privacy will be retained, i.e., my personal details will not be revealed.

The procedure as set out in the attached information sheet has been fully explained. I understand the benefits and risks involved. My participation in the project is voluntary.

I acknowledge that I have the right to question any part of the procedure and can withdraw at any time without negative consequences.

Name of participant \_\_\_\_\_

Signature of participant \_\_\_\_\_

Date \_\_\_\_\_