

# An Evaluation of Kahoot Application and Its Environment as a Learning Tool

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**Abstract**—Over the past 20 years, internet has seen continual advancement and with the advent of online technology, various types of web-based games have been developed. Games are frequently being used among different age groups from baby boomers to generation Z. Games are not only used for entertainment but also utilized as a learning approach transmitting education to a level that is more interesting and effective for students. One of the popular web-based education games is Kahoot with growing popularity and usage, which is being used in different fields of studies. However, little knowledge is available on university students' perception of Kahoot environment and application for learning subjects. Hence, the objective of the current study is to investigate students' perceptions of Kahoot application and environment as a learning tool. The study employed a survey approach by distributing Google Forms –created questionnaire, with high level of reliability index, to 62 students (11 males and 51 females). The findings show that students have positive attitudes towards Kahoot application and its environment for learning. Regarding Kahoot application, it was indicated that activities created using Kahoot are more interesting for students, Kahoot is useful for collaborative learning, and Kahoot enhances interest in learning lesson. In terms of Kahoot environment, it was found that using this application through mobile is easy for students, its design is simple and useful, Kahoot-created activities can easily be shared, and the application can easily be used on any platform. The findings of the study have implications for instructors, policymakers and curriculum developers.

**Keywords**—Application, environment, Kahoot, learning tool.

## I. INTRODUCTION

NOWADAYS, a wide array of learning platforms and software are being developed to help teachers and students in teaching and learning process where sustainable education environments are provided. Studies have indicated that inclusion of gamification apps influences and enhances language learning outcomes through creating a positive learning environment [1]-[4]. Gamification of instructional activities is a useful approach that educators can use to promote more effective learning environments by increasing problem-solving, critical thinking and competence in the classroom [5]. One of the impressive gamification apps is Kahoot [6]. Kahoot is a web-based multi-player real-time game that enables students to measure their learning in an engaging, entertaining manner where immediate feedback is provided [5].

Kahoot is a game-based learning tool that transforms classroom into a game show. Teachers can project questions on the classroom screen using personal computer or laptop and

get students to answer the questions by means of mobile devices. It is widely accepted that Kahoot causes great student engagement with more enjoyment, motivation and concentration [1], [5], [6]. Studies on Kahoot showed that Kahoot, as interactive quiz, positively impacts students' learning where students valued the inclusion of Kahoot activities in classroom stream [1], [5]. Kahoot utilizes a combination of graphics, colors, and music to create a good learning environment [7], [4]. The main focus of Kahoot is on 'learning through playing [2]. This design approach covers the ideology of the creators making learning more interesting. Reference [6] indicated that many students were involved in Kahoot activities and refocus when the teachers included a fun element. Hence, in the subsequent sections, Kahoot Environment (KE) and Kahoot Application (KA) are discussed at length.

## KE

Kahoot site provides an embedded guidance to help the novice user. However, the simplicity of Kahoot indicates that building quizzes is pretty self-explanatory [2]. Some researchers have highlighted some appealing features of Kahoot such as: easiness of using Kahoot on different platforms [2], [3], [8], simplicity, game-based [4], [9], easiness of 'password access of the application' [2], [4] simplicity and usefulness of design such as visual clues, easy-to-read question formats, colors, and shapes [3], easiness of sharing activity result [2], easiness of creating activities [10], nickname access [3], [4], projecting on a board [2], and time display for time management [11]. Kahoot app has no payment option or upgrade option. It is simple and easy to join Kahoot where a sign-in form a valid email account is required where students simply enter a pin on their personal mobile device [2]. Teachers can design and create quizzes, in a flexible way, to assess students' knowledge [7]. The teacher can develop a quiz at the start of the classroom session, to introduce a topic or assess students' prior knowledge; accordingly the teacher will be able to determine the direction of session focus. Besides, the teacher can use Kahoot at the end of the session to find scope of main points as well as assess how much students have obtained [6]. Kahoot presents an active, exciting environment by assisting students in improving their performances.

At the login, the app offers four choices: student, teacher, workplace, and social in which each has a discrete set of features which are suitable for the respective user [2], [3]. When the option 'teacher' is chosen, the user will undertake the control of the game and will activate the quiz, creating a unique pen that in turn opens the generated quiz for the

students. Regarding the quiz duration, the teacher can control the space that facilitates breaks for more explanation, discussion and debate. Kahoot allows teachers to create quizzes at any time individually or collaboratively as specific topics along with a wide range of prefabricated options are available.

Kahoot displays multiple-choice answers for a question on the user's device screen and they only need to touch a selection in order to log it. Here, the teacher utilizes a pre-set timer in order to stipulate the response time. Based the number of responses which are displayed on the teacher's screen view, they can check if all students answered the question [1]. The leaderboard that lists the top 5 competitors following each question encourages students' engagement and creates a healthy competition atmosphere. According to [1], "games can provide a safe environment of play which allows students to learn from their failures and they can be great educational tools to be used across content areas for review". Reference [1] found that 95% students perceive that Kahoot builds a positive classroom environment and 93% of participants agreed that Kahoot enhances positive atmosphere. Kahoot also has an attractive feature useful for the modest or shy students as they can compete under a pseudonym which allows their anonymity. It is also appropriate for the students with special educational needs and those who are suffering from learning disabilities. The application of visual cues, e.g., different shapes and colors, as well as simple, user-friendly questions and answer formats supports the students with different learning needs to work on it individually or collaboratively [3].

Reference [3] shows that Kahoot has some deficiencies that need to be addressed. The active time for password is not long; only five top scores are displayed, the competitive environment may cause problems among students; the questions do not appear on students' screen; [3] states "The time limit in the questions leads to mistakes; the answers/options may be delayed".

In a nutshell, Kahoot with simple attractive, easy to use interface, compatible with different devices and platforms, can be used collaboratively or individually for learners with different needs; however, as discussed, KE has some issues which need to be addressed.

#### *KAs*

It is argued that students' attentions throughout the course decrease in the first ten minutes of class time. Teachers need to regain students' attention by changing the environment and engaging students in interesting activities [12], [13]. This is where Kahoot can assist teachers in enhancing students' participation [14]. Reference [1] concurs that playing Kahoot fosters learning environment, motivates students, helps to underline the critical points, and to identify the lacking areas of the subject. KA effectively lends support to gamification of lesson [2]. Reference [2] found that the infusion of gamification method into classroom activities enhanced students' interests in class and their ambitions for success. They showed that gamification also positively influenced

students' motivation. Kahoot that requires limited amount of training can be used as a mean to provide student participation, vitality, and meta-cognitive support [15]. Kahoot was built and developed by social users, businesspersons, teachers and students [2], [16], Kahoot increases students' cognitive capacity through offering different learning experiences. Kahoot plays a significant role in gamification of different assessment programs as well as has contribution to the success of students of various levels. Reference [1] agrees that providing easy gaming tasks with immediate reinforcement might positively contribute to students' confidence to do specific tasks. Reference [5] found that students across three science cohort showed interaction, immediate feedback, enjoyable environment, and fun as benefits of Kahoot.

Users can add pictures, videos, and background music. They can also record and retrieve quizzes via internet [14]. It allows teachers to choose one of the options amongst discussion, quiz and questionnaire by logging into their account. Furthermore, the scores can be gained instantly through teacher-controlled display [3], [17]. Teachers can set responding time in Kahoot. When the game time is over, the users hear a sound and the class panel can accordingly check the correct and incorrect answers. Subsequently, 5 students with the top scores are displayed [3], [4], [11].

KA offers several advantages. It provides interesting collaborative learning activities [2], [3], with useful background audio [2], and increases learners' interests in lesson [3], [10]. The use of picture helps learners understand the content more easily [3], enhances success [16]. The well-timed questions lead to students' excitement [1], [3], [10], [11] and sharing activities through Kahoot increases motivation, and the question techniques provide the learners with different perspectives [3]. It also offers immediate feedback which boosts motivation [1], [5]. Other great features such as: delivering richer content; helping learn different topics, attractiveness of color harmony [3], the scoring system makes students ambitious to be among top-five scorers. It also supports active learning [1] and enhances effectiveness of lesson [5]; contributes to student's rapid-thinking ability [5], [18]; allows students to do self-expression comfortably; offers permanent learning activities; enables permanent learning compared to learning memory in traditional classroom environments; and it builds student courage to participate in activities [2]. Literature evidences that Kahoot as a learning tool can contribute to students' motivation, success, good learning experience, active learning, participation, rapid thinking, effectiveness of lesson, collaborative learning, problem-solving, etc. though it has some deficiencies [3].

In Malaysian context, some researchers have conducted studies on Kahoot for learning [19], [4], [20], [9]. Reference [19] conducted a qualitative study (interview and observation) involving 29 university students. They found that Kahoot is useful in intimating and enhancing students' engagement in language learning activities leading to the development of language skills. Reference [9] found that the participants actively engaged in game-based learning and were able to

master English effectively. Reference [20] conducted a focus group discussion and indicated that Kahoot assessment is effective towards students' good feedback practice. Reference [4] conducted a survey involving 113 students. The findings showed that students perceived Kahoot as effective, fun, and useful for feedback. It also improved their motivation. Reference [21] carried out a survey study and showed that Kahoot is beneficial for students in inducing motivation and engagement, enhancing and reinforcing learning language. Reference [22] conducted a survey on secondary school students and found that all students had positive experiences and attitudes when the teacher integrated Kahoot games into lesson. Most of students reported that Kahoot fostered their engagement in language learning. However, most of the studies discussed and investigated that Kahoot is good for language learning, but it could also be used for various subjects. Very few studies, if any have looked at Kahoot as a learning tool focusing on its environment and application. More specifically, there is a paucity of study on Kahoot at University College of Yayasan Pahang, where KA is gaining popularity.

#### *Research Objectives*

The objective of the current study was to investigate university students' perception of KE and KA as a learning tool.

#### *Theoretical Framework*

The game-based theory is founded on the idea engagement is associated with task performance, while the playing conditions could stimulate the brain to do active learning. Since in digital games content materials are integrated with games, this enables the brain to process from short term to long term memory [1], [23]. Hence, gamification provides an interesting environment for students to learn from their failure in which they can benefit from it in dealing with different content areas. Reference [24] defines gamification as the use of game-based mechanics, game thinking, and aesthetics to engage individuals, promote learning, motivate action, and solve problems. Gamification is a method utilized to produce meaningful and interesting experiences via integrating mechanical play into teaching and learning environments and applications. Hence, game-based learning is associated with the application of games to foster the learning experiences as a balance between gaming and content and its real world application is maintained. As a result of introducing gaming, the methodology was redefined and renamed as digital game-based learning [25].

Reference [26] indicates that there are three aspects of the application of game-based learning: a) the application of commercial title in which attractive and motivating games can be utilized for educational purposes though curriculum planning and training teachers to effectively use them for pedagogical aims, b) the serious-games, i.e., those games which are especially developed in order to train, educate, and inform, c) the games which are built by students themselves and develop and enhance students' problem-solving skills,

game design and programming. Another aspect was added by [27] that is process of integration of gamification into educational activities which is mediated by technology. Obviously, both gamifications and serious games could contribute to problem-solving, motivation, and promotion of learning regardless of the differences in their concept. On this note, [24] maintains: "when you get right down to it, the goals of both are relatively the same. Serious games and gamification both are trying to solve a problem, motivate, promote learning and using game-based thinking and techniques". Numerous studies have focused on the effect of gamification on education [1], [5], [3]. Several studies agree that there were statistically significant improvements regarding enhanced motivation, enjoyment and task commitment associated with gamification [28].

## II. METHODOLOGY

The study adopted a survey approach to collect data as the study attempts to investigate students' perceptions of KE and KA. The questionnaire was adapted from [2]. The online version of the questionnaire was constructed using Google Forms.

#### *Study Context*

The study was conducted at the faculty of education, University College of Yayasan Pahang (UCYP), Kuantan, Pahang, Malaysia. Informal interviews with UCYP lectures indicated that they are using Kahoot to teach different subjects. Hence, it was timely to carry out this study on students' attitudes towards KE and its application.

#### *Sampling Method*

The study selected 62 students, studying at UCYP. The rationale for the selection of these students is that they were using Kahoot for different subjects including English. The students were selected through purposive convenience sampling method. This is because one of the authors was teaching them English and they were easily accessible through WhatsApp group and they have the required information for the purpose of this study [29].

#### *Data Analysis Technique*

The study analyzed the collected data using descriptive statistics, i.e., mean, Standard Deviation, frequency, and percentage. This is because the study attempts to discuss students' perceptions KE and KA as learning tool [2].

#### *Study Procedure*

We first selected students, through purposive convenience sampling approach, who were using Kahoot for learning subjects. Prior to data collection, the authors assured that the students are participating in the study voluntarily by sending consent forms to them indicating that the data will only be used for the purpose of this study. For the purpose of anonymity, students were not required to write their names or leave their email addresses. Then upon their eagerness to participate in the study, the questionnaire was distributed through sending the Google Forms links to students (male =

11, female = 51) through WhatsApp. Subsequently, after examining the responses it was found that one questionnaire was incomplete and 61 responses (from 62 questionnaires) were valid and workable. The obtained data were analyzed by running descriptive statistics (frequency, percentage, Mean, and STD) on the data. The results of data analysis are presented in the following section.

### III. STUDY RESULTS

This section presents the result of participants' demographics analysis, the reliability index of constructs, and students' perceptions KE and KA subsequently.

#### A. Participants' Demographics

TABLE I  
PARTICIPANTS' DEMOGRAPHICS

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	11	17.7	18.0	18.0
Valid Female	50	80.6	82.0	100.0
Total	61	98.4	100.0	
Missing System	1	1.6		
Total	62	100.0		

As illustrated in Table I, in total, 62 students participated in the study from whom 61 responses were workable and analyzable. The males account for 17.7% (11) of the respondents, while females comprise 80% (50) of the participants, which is typically normal in Malaysian university colleges.

#### B. Reliability

This section presents the Cronbach's Alpha values of the constructs 'KE' and 'KA', respectively.

TABLE II  
RELIABILITY STATISTICS OF KE

Cronbach's Alpha	N of Items
.978	10

As illustrated in Table II, the construct 'KE', with 10 items, has a high reliability index (.978). Hence, there is a strong internal consistency between items of this variable. This means that KE is a suitable variable for data collection and data analysis to achieve the research objectives [29].

TABLE III  
RELIABILITY STATISTICS OF KA

Cronbach's Alpha	N of Items
.981	23

As indicated in Table III, the construct KA, with 23 items has high reliability index (.981). This means that this construct has a strong internal consistency between its items. This makes it a suitable variable for data collection and analysis to achieve the research objectives [29].

#### C. KE

As indicated in Table IV, the highest mean score belongs to the item 'using the application through mobile devices is easy' (mean = 3.89, STD = .87), while the lowest mean value is

related to 'password access of the application is easy to navigate' (mean = 3.68, STD = .82). The second item with the highest mean is the statement 'the design of Kahoot is simple and useful' (mean = 3.87, STD = .85), followed by 'activity results in the application can easily be shared' (mean = 3.85, STD = .80), 'the application can be easily used on all platforms' (mean = 3.82, STD = .87), and 'answers in the application can be easily given on smart phones' (mean = 3.81, STD = .90), 'activities may easily be created in the application' (mean = 3.79, STD = .83), 'nickname access of the application is easy to navigate' (mean = 3.77, STD = .83), 'projecting the application on a board facilitates answering' (mean = 3.76, STD = .86), and 'the time display of the activities in the application facilitates time management' (mean = 3.74, STD = .76).

TABLE IV  
DESCRIPTIVE STATISTICS

Item	Mean	Std
KE1: Password access of the application is easy to navigate.	3.68	.82
KE2: Nickname access of the application is easy to navigate.	3.77	.83
KE3: The application can easily be used on all platforms.	3.82	.87
KE4: The time display of the activities in the application facilitates time management.	3.74	.76
KE5: Activity results in the application can easily be shared.	3.85	.80
KE6: Using the application through mobile devices is easy.	3.89	.87
KE7: Activities may easily be created in the application.	3.79	.83
KE8: Answers in the application can be easily given on smart phones.	3.81	.90
KE9: Projecting the application on a board facilitates answering.	3.76	.86
KE10: The design of Kahoot is simple and useful.	3.87	.85

TABLE V  
DESCRIPTIVE STATISTICS

	N	Mean	Std. Deviation
KE	62	3.7984	.77237
Valid N (listwise)	62		

As illustrated in Table V, the overall mean of KE is 3.7984. Data analysis indicates that KE mean is below 4 (3.79), which is less than the finding of [2]. The justification might be that Kahoot use may not be satisfactory at UCYP.

#### D. KA

As illustrated in Table VI, the statement 'activities created using Kahoot are more interesting' has the highest mean value (mean = 3.92, STD = .87), while the least mean value belongs to the item 'the background audio in Kahoot is distracting' (mean = 3.37, STD = .96). The second item with the high mean value is 'using Kahoot makes for more effective collaborative learning' (mean = 3.87, STD = .96), the third items with high mean score are 'Kahoot increases interest in the lesson' (mean = 3.85, STD = .92), and the item 'using pictures in KAs allows the user to more easily understand the content' (mean = 3.85, STD = .80), followed by 'Kahoot improves success' (mean = 3.84, STD = .86), 'using videos in KA attracts greater student attention' (mean = 3.84, STD = .79), 'the use of Kahoot in the classroom encourages learners' (mean = 3.83, STD = .76), 'well-timed questions in Kahoot

activities increase student excitement' (mean = 3.82, STD = .85), 'sharing activities via social media increases motivation' (mean = 3.81, STD = .78), 'question techniques in the activities performed by Kahoot provides the students with different perspectives' (mean = 3.79, STD = .92), 'using Kahoot in education increases student motivation' (mean = 3.77, STD = .81), 'Kahoot gives students the opportunity to deliver richer content' (mean = 3.77, STD = .81), 'the color harmony of the buttons in the application is remarkable' (mean = 3.77, STD = .84), 'the scoring system of Kahoot increases the ambition of students to be a top-five scorer' (mean = 3.76, STD = .90), 'Kahoot enables active learning' (mean = 3.76, STD = .82), 'Kahoot increases the effectiveness of the lessons' (mean = 3.74, STD = .88), 'Kahoot improves the rapid-thinking abilities of students' (mean = 3.74, STD = .86), 'activities performed using the KA allow for easy learning of the topic' (mean=3.74,STD=.77), 'Kahoot allows for comfortable self-expression' (mean = 3.73, STD = .83), 'Kahoot provides permanent learning in classroom activities' (mean = 3.71, STD = .75), 'lessons performed with Kahoot enable permanent learning compared to learning memory in traditional classroom environments' (mean = 3.69, STD = .95), 'the active use of Kahoot builds student courage to participate in activities' (mean = 3.69, STD = .82).

TABLE VI  
DESCRIPTIVE STATISTICS

Item	Mean	Std.
KA1: Lessons performed with Kahoot enable permanent learning compared to learning memory in traditional classroom environments.	3.69	.95
KA2: Kahoot increases interest in the lesson.	3.85	.92
KA3: Kahoot improves success.	3.84	.86
KA4: Activities created using Kahoot are more interesting.	3.92	.87
KA5: Using Kahoot makes for more effective collaborative learning.	3.87	.87
KA6: Kahoot increases the effectiveness of the lessons.	3.74	.88
KA7: Kahoot allows for comfortable self-expression.	3.73	.83
KA8: Using Kahoot in education increases student motivation.	3.77	.81
KA9: Kahoot enables active learning.	3.76	.82
KA10: Question techniques in the activities performed by Kahoot provide the students with different perspectives.	3.79	.92
KA11: Kahoot improves the rapid-thinking abilities of students.	3.74	.86
KA12: Kahoot provides permanent learning in classroom activities.	3.71	.75
KA13: Well-timed questions in Kahoot activities increase student excitement.	3.82	.85
KA14: Kahoot gives students the opportunity to deliver richer content.	3.77	.81
KA15: Using pictures in KAs allows the user to more easily understand the content.	3.85	.80
KA16: Using videos in KA attracts greater student attention.	3.84	.79
KA17: The background audio in Kahoot is distracting.	3.37	.96
KA18: Sharing activities via social media increases motivation.	3.81	.78
KA19: The scoring system of Kahoot increases the ambition of students to be a top-five scorer.	3.76	.90
KA20: The use of Kahoot in the classroom encourages learners.	3.83	.76
KA21: The active use of Kahoot builds student courage to participate in activities.	3.69	.82
KA22: Activities performed using the KA allows for easy learning of the topic.	3.74	.77
KA23: The color harmony of the buttons in the application is remarkable.	3.77	.84

TABLE VII  
KA MEAN

	N	Mean	Std. Deviation
KA	62	3.7637	.74557
Valid N (listwise)	62		

As indicated in Table VII, the overall mean of KA items is around 3.76, which is less than the reposted mean score in the literature [2]. The examination might be that the application of Kahoot is not at satisfactory level at UCYP.

#### IV. DISCUSSION

This study investigated university students' perceptions of KE and its application for learning subjects. Concerning KE, the overall mean is below 4 (3.79), which is less than the finding of [2]. The justification may be that the lectures are not benefiting from Kahoot features satisfactorily. The finding shows that easiness of Kahoot has the highest mean score. This means that easiness of KE is one of the great advantages of this app which is very appealing to the users in all fields. This is consistent with findings of [30] which state that what amazed their users was the easiness of Kahoot which increased students' motivation. Kahoot as a simple, game-based, creative and easy tool attracts students [31]. However, the least mean score belongs to easiness of 'password access of the application', but [2] indicated that Kahoot password access has the mean of 4.43. Reference [4] also discussed the easiness of use of password. The low mean may be associated with the issue that the access password or code is not active for a long time [3]. It was also found that the application has a simple and useful design like visual clues, easy-to-read question formats, colors, and shapes [3], [31]. Kahoot makes sharing the activity results easy [2] but not all of the students appear on the score table and only 5 top results are announced [3]. The usability of Kahoot on all platforms was highlighted [3], [8]. Kahoot allows students to use smart phones to answer the questions [2] though the competitive environment may cause problems among students [3]. Another appealing feature of Kahoot is easiness of creating activities [10], but only the questions prepared by the teacher can be done [3]. It enables students to select nickname [3], [4]. Kahoot allows teachers to project activities on a board [2] though the questions do not appear on the student screen [3]. Time display for time management is attractive [11], nevertheless, [3] states "The time limit in the questions leads to mistakes; the answers/options may be delayed". In a nutshell, Kahoot with simple attractive, easy to use interface can be used collaboratively or individually for learners with different needs; however, as discussed, the overall mean score of Kahoot is low as compared to literature. This might suggest that the features of Kahoot are not used at a satisfactory level.

Regarding KA, it was found that the overall mean of KA items is around 3.76, which is less than the findings of previous study [2]. The explanation might be that overall the use of Kahoot is not satisfactory. It was shown that the highest mean score belongs to the statement 'activities created using Kahoot are more interesting'. This means that students believe

that activities created using Kahoot are more interesting in comparison with the conventional ways of making activities, which is consistent with literature [2], [3]. The lowest mean value is related to the item 'the background audio in Kahoot is distracting', which reaffirms the findings of [2]. This finding suggests that students find the background audio interesting. Kahoot lends support to collaborative learning and increases learners' interests in lesson [3], [10]. The use of picture in Kahoot helps learners to understand the content more easily [3]. Kahoot enhances students' success; using videos attracts students' attention; and it encourages students to participate and learn. The well-timed questions enhance students' excitement [1], [11]. The question techniques provide the learners with different perspectives [3], [19]. Using this app increases motivation due to immediate feedback, sharing activities and enjoyable environment [1], [5], [19], [9]. It helps to deliver richer content, the button color harmony is attractive, and the scoring system makes students ambitious to be among top-five scorers; however, [3] argues that this is a disadvantage as only five top scores are displayed. It supports active learning [1], [20] and enhances effectiveness of lesson [5], where students learn to think rapidly to decide on correct answers [5], [18]. It lends support to learning the topics easily and allows students to do self-expression comfortably. It offers permanent learning activities and enables permanent learning compared to learning memory in traditional classroom environments. It also builds student courage to participate in activities [2].

Overall, the reasons of low mean score could be associated with low internet connectivity, lack of consistency in using Kahoot by lecturers, and technical problem such as mobile phone freezing, etc.

#### V. CONCLUSION

The current study investigated university students' perceptions of KE and KA for learning subjects. The study conducted a survey using questionnaire to collect data. The study involved a sample of 62 students studying at UCYP. The findings show that KE is suitable for learning though the application level of Kahoot appears to be unsatisfactory. There are different features of Kahoot that encourage students to use it for learning.

The current study focused on students' perceptions of KE and its application. A study on lecturers' attitudes towards KE and KA might be of interest. The present research was only a survey study but drawing upon the qualitative aspect of study might deepen our understanding of students' attitudes towards Kahoot as a tool for learning subjects.

#### VI. IMPLICATION

Lectures need to benefit from KE and KA more. They should organize lesson that integrate content with game-based learning through gamification. They should keep students motivated by encouraging collaborative activities with safe and competitive feeling to the environment. Besides, the issues of internet connection and lack of consistency in using

the app should be addressed. In addition to embedding gamification in the main stream, lectures might benefit from Kahoot in extracurricular activities. Incorporation of different gamification activities to learning can help students more effectively adapt to and concentrate on lesson which in turn enhances their motivation.

#### REFERENCES

- [1] N.C. Aktekin, H. Çelebi, &M. Aktekin. "Let's Kahoot! Anatomy". *International Journal of Morphology*, (2018), 36(2).
- [2] H. Bicen and S. Kocakoyun, "Perceptions of students for gamification approach: Kahoot as a case study." *International Journal of Emerging Technologies in Learning (iJET)* 13.02 (2018): 72-93.
- [3] H. S. Çetin, "Implementation of the Digital Assessment Tool Kahoot in Elementary School." *International Technology and Education Journal* 2.1 (2018): 9-20.
- [4] M. A. A. Ismail and J. A. M. Mohammad, "Kahoot: A promising tool for formative assessment in medical education." *Education in Medicine Journal* 9.2 (2017).
- [5] K. Cameron and L. A. Bizo, "Use of the game-based learning platform KAHOOT! To Facilitate learner engagement in Animal Science students." (2019).
- [6] A. I. Wang, M. Zhu, and R. Sætre, "The effect of digitizing and gamifying quizzing in classrooms." *Academic Conferences and Publishing International*, 2016.
- [7] G. M. Boden and L. Hart, "Kahoot-Game Based Student Response System." *Compass: Journal of Learning and Teaching* 11.1 (2018).
- [8] S. Wichadee and F. Pattanapichet, "Enhancement of performance and motivation through application of digital games in an English language class." *Teaching English with Technology* 18.1 (2018): 77-92.
- [9] J. Tivaraju, M. M. Yunus, and J.Badusah, "Learning English is fun via Kahoot: students' attitude, motivation and perceptions." *Proceedings on Seminar on Transdisiplin Education (STEd2017)*. 2017.
- [10] C. Ren and J. Wagner. "'KAHOOT!'" *The Electronic Journal for English as a Second Language Urgency* 20.2 (2016): 1-10.
- [11] N. Singer, "Kahoot app brings urgency of a quiz show to the classroom." *New York Times* (2016).
- [12] N. Geri, A. Winer, and B. Zaks, "A learning analytics approach for evaluating the impact of interactivity in online video lectures on the attention span of students." *Interdisciplinary Journal of E-Learning and Learning Objects* 13.1 (2017): 215-228.
- [13] K. Wilson and J. H. Korn. "Attention during lectures: Beyond ten minutes." *Teaching of Psychology* 34.2 (2007): 85-89.
- [14] M. J. Mainini and L.C. Banes, "Differentiating instruction to increase conceptual understanding and engagement in mathematics". 2017.
- [15] C. M. Plump and J. LaRosa, "Using Kahoot! in the classroom to create engagement and active learning: A game-based technology solution for eLearning novices." *Management Teaching Review* 2.2 (2017): 151-158.
- [16] M. B. Yılmaz, "Dijital Değerlendirme Araçlarının Ortaokul Öğrencilerinin Derse Bağlılıklarına Etkisi: İki Farklı Okulda Durum." *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi* 17.3: 1606-1620.
- [17] R. Walsh, (2017, August). Turning the smartphone into an EAP classroom learning device through Kahoot!.In *EUROCALL August 2017*.
- [18] R. Dellos, "Kahoot! A digital game resource for learning." *International Journal of Instructional Technology and Distance Learning* 12.4 (2015): 49-52.
- [19] N. H. M. Muhridza, N. A. M. Rosli, A. Sirri and A. A.Samad, "Using game-based technology, KAHOOT! for classroom engagement." *LSP International Journal* 5.2 (2018).
- [20] N. N. Omar, "The effectiveness of Kahoot application towards students' good feedback practice." *PEOPLE: International Journal of Social Sciences* 3.2 (2017).
- [21] A. L. D. Tan, M. Ganapathy, &M. Kaur, "Kahoot! It: Gamification in Higher Education". *Pertanika Journal of Social Sciences & Humanities*, 2018, 26(1).
- [22] P. Kaur and & R. Naderajan, "Kahoot! in the English language classroom.", *South East Asia Journal of Contemporary Business, Economics and Law*, 2019, Vol. 20, Issue 6 (Dec)
- [23] A. K. Banikowski and T. A. Mehrling, "Strategies to enhance memory based on brain-research. *Focus Excep't. Child.*, 32(2):1-16, 1999.
- [24] K. M. Kapp, "The gamification of learning and instruction: game-based

- methods and strategies for training and education". 2012, New York, NY: John Wiley & Sons.
- [25] M. Prensky, "Digital game-based learning". 2001, McGraw-Hill, New York.
- [26] R. E. Van, "Digital game-based learning: it's not just the digital natives who are restless". *EDUCAUSE Rev* 2006, 41(2):16–30
- [27] M. Gertrudix, F. Gertrudix, "Aprenderjugando. Mundos inmersivos abiertos como espacios de aprendizaje de losylasjóvenes". *Revista de estudios de juventud*, 2013, 101:123–137.
- [28] M. Cebrían, "Juegosdigitales para procesoseducativos. In: Aguaded I, Cabero J (eds) *Tecnologías y medios para laeducaciónen la e-sociedad*. Alianza, Madrid, 2013, pp 185–210.
- [29] A.C. Klassen, J. Creswell, V. L. P. Clark, K.C. Smith&H. I. Meissner, "Best practices in mixed methods for quality of life research." *Quality of Life Research* 21.3 (2012): 377-380.
- [30] M. Batsila and C. Tsihouridis, "'Let's go... Kahooting"—teachers' views on CRS for teaching purposes." *International Conference on Interactive Collaborative Learning*. Springer, Cham, 2017.
- [31] C. Tsihouridis, D. Vavougiou, and G. S. Ioannidis, "Assessing the learning process playing with Kahoot—a study with upper secondary school pupils learning electrical circuits." *International conference on interactive collaborative learning*. Springer, Cham, 2017.