The Effect Of Using Kahoot As Formative Assessment Tool At Undergraduate Level To Improve Learning Outcomes

Fatima Batool[1], Saba Iqbal[2], Muhammad Mudassar Mahmood[3], Ra'ana Yasin[4], Hassaan Bin Adil[5,] Laiba Naeem[6]

[1]*Fatima Batool, lecturer at School of Allied Health Sciences, CMH LMC & IOD, Lahore, fatima_batool@cmhlahore.edu.pk*
[2]*Saba Iqbal, Assistant Professor SHaPE, CMH LMC & IOD, Lahore*
[3]*Muhammad Mudassar Mahmood, consultant surgeon Services hospital/SIMS Lahore*
[4]*Ra'ana Yasin, Woman Medical Officer at services hospital Lahore*
[5] *Hassaan Bin Adil, demonstrator at School of Allied Health Sciences, CMH LMC & IOD, Lahore*
[6]*Laiba Naeem, lecturer at Sialkot college of Physical Therapy*
Corresponding Author:
Fatima Batool, lecturer at Allied Health Sciences, CMH LMC & IOD, Lahore

Abstract:

The evaluation of 21st century abilities has been one of the "hottest" subjects in the community of educational measurement for the past ten years.[1]

Background: Teachers frequently have difficulty keeping students' interest in lectures, and within the first few minutes of session, interest in the content starts to decline. Teachers must engage students and change the setting in order to regain their students' attention. Teachers can utilise the quizzing programme Kahoot as a formative assessment tool increase student's participation during lectures.[4]

Purpose of study: The aim of the study is to determine whether using this gaming programme Kahoot would improve grades for the medical students at CMH LMC& IOD and whether gamification has any positive effects on learning and enjoyment.

Methodology: An online competition using Kahoot® will be implemented on medical students of CMH Lahore Medical College & IOD in order to both stimulate their attention and strengthen their competencies. Furthermore, closed- or open-ended feedback questions will be gathered and examined.

Key words: Educational measurement community, Kahoot, Formative Assessment, Classroom dynamics, Closed or Open-ended feedback.

Introduction:

Background of the study

Teachers frequently have difficulty keeping students' interest in lectures, and within the first few minutes of session, interest in the content starts to decline. Teachers must engage students and change the setting in order to regain their students' attention. Teachers can utilise the quizzing programme Kahoot as a formative assessment tool increase student's participation during lectures.[4] As the advantages of prompt feedback and student participation in electronic-Learning become realised, instructional games

are getting more popular in the classroom. Lack of time frequently limits the usage of modern technologies in higher education, a lack of knowledge, and uncertainty in the academic impact of these endeavours. Kahoot is a potent eLearning tool that may be used with no staff or student training to bring dynamism, student engagement, and meta-cognitive assistance to courses in higher education.[2] The fundamentals of reading, writing, interpretation, and synthesis are still emphasised in 21st century learning and assessment, but they are also advanced.[1]

Purpose of the study:

Based on students replies and personal experience applying Kahoot quizzes in Graduate and undergrad classes Students have seemed to enjoy playing Kahoot!.[2] The majority of teachers believe that it may be challenging to keep students' attention, engagement, and interest throughout an extended presentation. The classroom environment and the standard of learning outcomes might suffer from a lack of motivation. Because of the lengthy courses and minimal interaction, this problem is significantly more of a challenge in higher education. According to academic studies, students who actively engage in the learning process retain more information than passive learners.[3]

By using the free online tool Kahoot Teachers can sign up on the website and start creating their Kahoot games and can select from a Kahoot library. Instructors can sign up on the website and start creating their personal Kahoot games and can select from a collection of Kahoot quizzes.[4]

The current study used a qualitative inquiry to investigate how Kahoot! helped students learn. The purpose of the study is to use kahoot as formative assessment tool & to investigate student engagement, motivation, and learning in the classroom.[5]

With it's basic and creative game advancement instrument, the Kahoot! stage permits educators to skirt the specialized obstacle they could somehow experience in fostering a computerized game and spotlight rather on educational results.[6] The use of technologies in education has grown as a result of their potential for motivation as well as the ease with which they enable communication and access to information.[7] Serious games are crucial elements in the gamification of the learning system. It has been proven that implementing interactive tests with software like Kahoot increases student motivation.[8]

Customary instructive strategies, for example, "front-facing educating," or "chalk-and-talk," can prompt lack of engagement as they don't stress understudy drove innovativeness, prompting weariness.[9]

At the point where typically troublesome Questions are introduced to the understudy in a tomfoolery and entertaining learning climate, the study hall stands to benefit from the clever methods.[10] The most well-known games' principles are presented in Table I. In the K–6 level, instruction is provided as an applied outcome. These repairmen give game elements as well as inspiration, and lead to the sentiments illustrated in table.[18,19]

Table 1. Game Mechanics and Game Dynamics [20]

Game Mechanic	Game Dynamic
Points	Reward
Level	Status
Trophies, Badges, Achievements	Achievement
Virtual Goods	Self-expression
Leader Boards	Competition
Virtual Presents	Altruism

For gamification plans to emphatically affect instructive outcomes, the learning climate must consolidate elements, mechanics, and the suitable parts. At the end of the day, a gamification application in which this large number of parts are utilized could work with a necessities situated educational experience in the study hall. [21]

This study seeks to provide students the opportunity to assess the Kahoot application that has been included into the current learning environment. Our aim is to ascertain the impact of this gamification strategy on student accomplishment and ascertain their view of using the most popular gamification software, the Kahoot application. furthermore to see how gamification affects the active learning of pupils.

Objectives of the Research:

The objectives of this research are:

- To improve the active learning of students of MID using Kahoot.
- To demonstrate Kahoot as a better formative assessment tool .

Methodology:

The current study was cross-sectional. Convenient type of non-probability sampling technique were used. This study was conducted in the one month period in CMH Lahore Medical College & IOD,Pakistan. The Sample size of the current study was calculated 73 (Fig: 1), calculated online taking 95% confidence level. The Medical Imaging Doctors (MID) 77 students of CMH LMC & IOD, Pakistan. Were selected. The ethical approval/permission was obtained from the ethical review committee, CMH Lahore Medical College & IOD, Case#731 /ERC/CMH/LMC. Participation in this study was voluntary, the students were explained that the results of this study will be presented collectively and no individual participant will be identified and no financial help will be provided to the participants for participation in the study. 20 minutes were given for the response. Consent from students was taken and privacy and confidentiality were ensured.

Sample size: **73**

This means 73 or more measurements/surveys are needed to have a confidence level of 95% that the real value is within ±5% of the measured/surveyed value.

Confidence Level:	95% ▾	
Margin of Error:	5%	
Population Proportion:	50%	Use 50% if not sure
Population Size:	89	Leave blank if unlimited population size.

Calculate ▶ Clear

Figer: 1

Data Collection procedure:

Kahoot quiz was played in the class of medical imaging doctors (MID) of CMH LMC & IOD, Lahore. The game was played online in the class with proper internet connection. Game include quizzes about the topics previously taught to the class. Instructor started the game by signing up on the website and started creating her own Kahoot! tests (or pick from a collection of already saved Kahoot! Quizzes). Quiz features were explained to students as follows: Quizzes have feature of background music, images, and videos(Fig 02). The tests will be saved, and anyone with Internet connection can access them later. To attempt the questions, students will use computers, iPads, or cellphones. To begin, students will enter their names and the Game passcode will be provided by the instructor. When the quizz will starts, The quizzes with allocated time will slide, and students will score points for how quickly and accurately they respond. After completing the assignment, students will obtain an overall grade, and the highest three grades will be shown on the screen.

Then the game begun and results were saved on instructor's laptop. The quiz included total of 33 questions regarding vascular ultrasound previously taught in the class. some questions also have animations or pictures added by the instructor. The quiz was played in two sessions 1st with 53 students and 2nd with 22 students (Fig:02 & 03). Results obtained as follows:
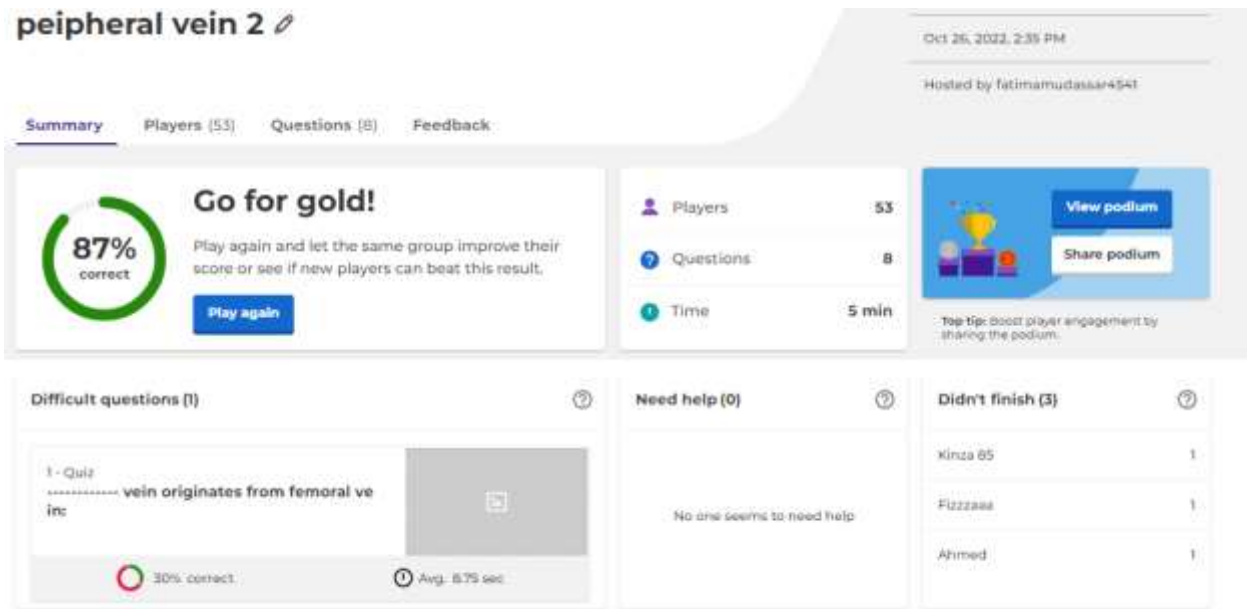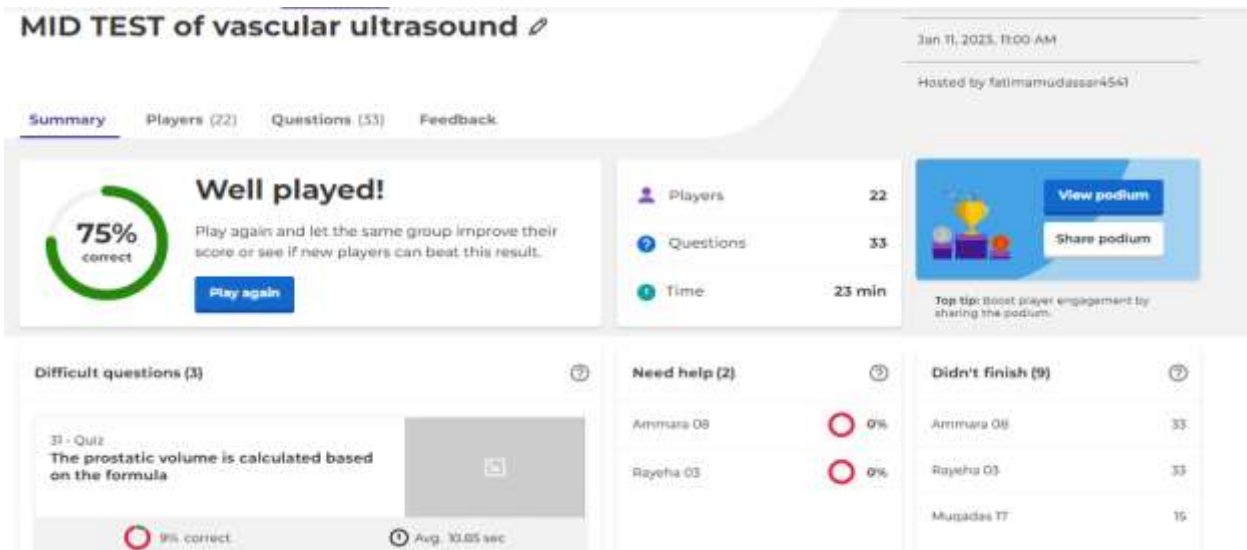
Fig: 02

Fig: 03

Later on A survey was conducted online regarding the kahoot quiz played previously in class, a google form containing eight questions was given to the students from the host. Total 77 students of medical imaging doctors (MID) CMH LMC & IOD had participated in the survey including two of the students who were absent in the class when kahoot quiz was played with rest of the class. The survey was conducted online with proper internet connection. Names and email IDs were asked and total eight questions were added in google form.[8]

Data Analysis:

Using SPSS 26.0, all the data was evaluated. The t-test and Pearson correlation coefficient were used. A p-value of .05 or less was considered significant.

Results :

Table 1. Results from Student experience Survey
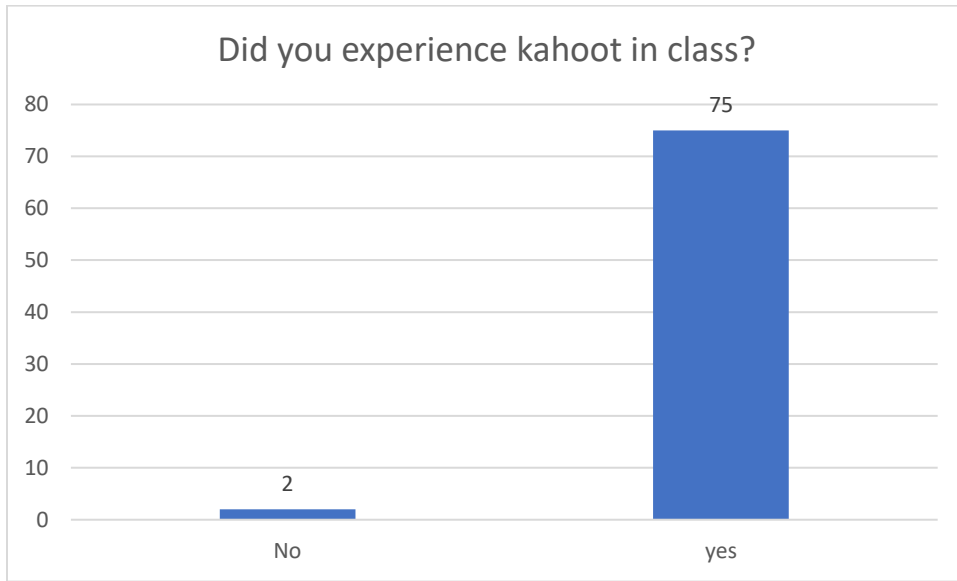
Table: 2 Detailed demographic information for participants

No of students	77	
Gender	67 (Female)	10 (Male)
Age	22.7 Mean (average)	0.85±SD

We conducted an independent samples t-test to examine if there were any notable gender differences in the average age of the students. The findings demonstrated that there was no significant distinction in the mean age of female (M = 22.65, SD = 0.80) and male students (M = 23.10, SD = 1.16), t(75) = -1.45, p = .152, two-tailed. Moreover, the Pearson correlation coefficient between age and gender was r = -.07, which suggests a weak negative association between the two variables.

Table: 03 Survey Questions with students' responses

Survey Questions	Total Participants (n=77)			
When I play Kahoot?	I have fun and I learn 72	I have fun but I don't learn 02	I don't have fun but I learn 03	
Playing Kahoots helps me reinforce what I learned in class:	It helps me a lot 28	It helps me 17	It helps me a little 32	It doesn't help me at all 00
Playing Kahoots motivates me to learn the subject	Quite a lot 33	Little 14	A Lot 02	
I prefer to do the Kahoot?	At the end of class 35	As soon as class starts 22	In the middle of class 20	
I would like the Kahoot's length to be?	Long (>15min) 15	Medium (5-15min) 51	Short (<5min) 11	
I prefer the teacher to use to explain the theory:	His/her explanation combined with practical exercises 12	His/her explanation combined with Kahoot and practical exercises 48	His/her explanation combined with Kahoot 07	Exclusively his/her explanation 05
In general, I consider Kahoot to be:	Necessary 51	Essential 21	Un-Necessary 03	Unimportant 05

The majority of participants 72 out of 77 (93.5%) reported having fun when playing Kahoot, and 70 out of 77 (90.9%) reported that they either learned or reinforced what they learned in class when

playing Kahoot, online gaming assessment was found to be helpful in reinforcing what was learned in class, with 28 (36.36%) participants reported it help and helped them a lot, 17 (22.07%), 32 (41.55%) respectively. No one reported it doesn't help them. Only 3 out of 77 participants (3.9%) reported not having fun and not learning when playing Kahoot. 33 out of 77 participants (42.9%) reported that playing Kahoot motivates them to learn the subject quite a lot, 14 (18.2%) reported that it motivates them a lot, and only 2 (2.6%) reported that it does not motivate them at all.

Participants 35 out of 77 (45.5%) preferred to do Kahoot at the end of class, 22 (28.6%) preferred to do it as soon as class starts, and 20 (26.0%) preferred to do it in the middle of class. 51 out of 77 participants (66.2%) preferred the Kahoot length to be medium (5-15 minutes), 15 (19.5%) preferred it to be long (>15 minutes), and only 11 (14.3%) preferred it to be short (<5 minutes). 48 out of 77 participants (62.3%) preferred the teacher's explanation combined with Kahoot to reinforce the theory, 12 (15.6%) preferred the teacher's explanation combined with practical exercises, 7 (9.1%) preferred the teacher's explanation combined with Kahoot and practical exercises, and only 5 (6.5%) preferred exclusively the teacher's explanation. More than 70% of participants (72 out of 77) considered Kahoot to be either necessary or essential, while only 8.4% (6 out of 77) considered it unimportant or unnecessary.

Discussion:

The reason for this contextual investigation was to assess a game based mediation intended to further develop understudy inspiration and fulfillment, as well as the outcomes and results of learning and the assessment of understudy fulfillment after the intercession.[22]

The introduction of Kahoot in general education courses appears to have been successful, as with other activities. The majority of students had a favorable outlook on learning (40.3% accept that it builds up what have been learned and 49.4% believe that it motivates quite a lot to learn). The majority of students (62.3%) thought that using Kahoot was necessary. Students seemed to prefer teaching theoretical lessons using Kahoot and practical tasks (62.3%).

Moreover, the better academic show in the exploratory get-together into which Kahoot was introduced further sponsorships the result of the intercession. This work proposes a game-based experience applied in the higher enlightening environment of clinical imaging specialists of CMH medical college ,Lahore,Pakistan. The mark of the audit is to measure the improvement in student motivation and academic execution as a result of introducing the game based understanding.

A serious game-based learning has been presented in the hypothetical meetings. In particular, intuitive tests utilizing the Kahoot device have been utilized, consolidating surveys for every one of the hypothetical meetings. What's more, lists of competitors have been utilized to support cooperation. The outcome permits to express that the serious game experience is plainly certain according to the perspective of the inspiration and level of fulfillment of the understudy, which is obviously seen in the fulfillment review did on them. This end is consistent with an enormous part of the gamification and game-based experiences overviewed in the front line, in which a sensible impact on motivation is taken note.[23]

Since Kahoot is so well known, applying the experience to various scholastic disciplines is basic. Benefits from this study may likewise be seen in different fields, like the humanities or sociologies. In this approach it is prescribed as future review to reproduce this involvement with different degrees and make a correlation with the discoveries procured in this examination.

Conclusion:

The results of the survey showed that the majority of the 77 participants had fun and learned while playing Kahoot, Kahoot was found to be helpful in reinforcing what was learned in class, and it motivated them quite a lot to learn the subject. Most participants preferred medium-length Kahoots and doing them at the end of class. They also preferred the teacher's explanation combined with Kahoot to explain the theory. Finally, most participants considered Kahoot to be necessary or essential. Overall, the results suggest Kahoot is an efficient platform for engaging students in learning and reinforcing their understanding of class material.

Acknowledgement

The authors would like to acknowledge all medical students who participated in the research.

Conflict of Interest

The authors declare no conflict of interest.

References:

1-Geisinger KFJAMiE. 21st century skills: What are they and how do we assess them? 2016;29(4):245-9.

2- Plump CM, LaRosa JJMTR. Using Kahoot! in the classroom to create engagement and active learning: A game-based technology solution for eLearning novices. 2017;2(2):151-8.

3- Wang AI, Tahir RJC, Education. The effect of using Kahoot! for learning–A literature review. 2020;149:103-818.

4- Nurse Educator. Kahoot! in the Classroom: Student Engagement Technique. 2017; 42 (6): -280.

5- A Sherlock. Licorish, E Helen. Owen, Daniel Ben & George Jade Li. Students' perception of Kahoot!'s influence on teaching and learning. Research and Practice in Technology Enhanced Learning.2018,13(9).

6- Graham KJLQ. TechMatters: Getting into Kahoot!(s): Exploring a game-based learning system to enhance student learning. 2015;42(3):4.

7- M Correia, R Santos. Game-based learning: The use of Kahoot in teacher education. International Symposium on Computers in Education (SIIE).2017.

8- A Fuster-Guilló. ML Pertegal-Felices. AJ-Morenilla. JA- Lopez.MLR-Soliveres.FR- Calle. Evaluating Impact on Motivation and Academic Performance of a Game-Based Learning Experience Using Kahoot: Front. Psychol. Sec. Educational Psychology 2019;10.

9- SM Jones. P Katyal. X Xie. MP Nicolas. A 'KAHOOT!' Approach: The Effectiveness of Game-Based Learning for an Advanced Placement Biology Class.2019;50(6).

10- H Bicen. S Kocakoyun. Perceptions of Students for Gamification Approach:

Kahoot as a Case Study. iJET.2018;13(2).

11- Zichermann, G., & Cunningham, C. Gamification by design: Implementing game mechanics in web and mobile apps. O'Reilly Media, Inc.2011.

12- Huckabee. I. Bissette. T. Learning made fun. Training Industry Magazine, 2014;32–35.

13- Muntean, C. I. Raising engagement in e-learning through gamification: virtual learning, Kelowna, British.2016.

14- Hamari J, Koivisto J, Sarsa H. Does gamification work?--a literature review of empirical studies on gamification. In2014 47th Hawaii international conference on system sciences 2014 Jan 6 (pp. 3025-3034). Ieee.

15- Hamari J, Koivisto J, Pakkanen T, editors. Do persuasive technologies persuade?-a review of empirical studies. International conference on persuasive technology; 2014: Springer.

16- Bicen H, Kocakoyun SJIJoETiL. Perceptions of students for gamification approach: Kahoot as a case study. 2018;13(2).

17- Hunter D, Werbach K. For the win: Wharton digital press Philadelphia, PA, USA; 2012.

18- Gadiyar AR. Gamification 3.0: The power of personalization. White paper. Cognizant's Global Technology. 2014.

19- González CS, Toledo P, Muñoz V. Enhancing the engagement of intelligent tutorial systems through personalization of gamification. International Journal of Engineering Education. 2016 Jan 1;32(1):532-41.

20- Bunchball I. Gamification 101: An introduction to the use of game dynamics to influence behavior. White paper. 2010 Feb 13;9:1-8.

21- Barata G, Gama S, Jorge J, Gonçalves D. Studying student differentiation in gamified education: A long-term study. Computers in Human Behavior. 2017 Jun 1;71:550-85.

22- Fuster-Guilló A, Pertegal-Felices ML, Jimeno-Morenilla A, Azorín-López J, Rico-Soliveres ML, Restrepo-Calle FJFiP. Evaluating impact on motivation and academic performance of a game-based learning experience using Kahoot. 2019;10:2843.

23- Villagrasa S, Fonseca D, Durán J, editors. Teaching case: applying gamification techniques and virtual reality for learning building engineering 3D arts. Proceedings of the second international conference on technological ecosystems for enhancing multiculturality; 2014.