

# Effect of Kahoot on Motivation of Fourth year MBBS students in the subject of Ophthalmology

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## ABSTRACT

**Introduction:** Different researches on Kahoot (gamification tool) have been done during COVID 19 to address the issue of students' lack of interest in online teaching. These studies are focused on the use, outcome scores and perceptions of the students. There is a need for a comparative study to see the effect of Kahoot on the motivation of students in online lectures.

**Objective:** To compare the effects of Kahoot on motivation of students after using Kahoot and without Kahoot in online lectures.

**Methods:** This was a quasi-experimental study done at Ameer ud din Medical College, Lahore. All fourth year students, who were willing to participate in the research were included. Two online lectures were planned; first was without use of Kahoot and the other lecture was with the use of Kahoot. After the lectures, the students were asked to fill the Situational motivation scale (SIMS) form. Comparison was made between the motivation scales after lectures with Kahoot and without use of Kahoot. Independent t-test was applied to compare between the two situations. The mean, median, minimum, maximum and standard deviation were calculated from median score of above variables.

**Results:** Intrinsic motivation, identified regulation and autonomous motivation index were significantly greater with the use of Kahoot as compared to without Kahoot ( $p < 0.05$ ). However, external regulation and amotivation were significantly greater in the control lectures without Kahoot.

**Conclusion:** Kahoot is a good online tool to increase motivation of students in online lectures. It makes learning fun by rewarding students with higher scores.

**Keywords:** Gamification, Medical education, Internal motivation, Autonomous motivation.

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## INTRODUCTION

It has long been reported that maximum attention span during lectures is 10 to 15 minutes, which makes it a challenging task for teachers to keep students motivated and attentive during lectures (Wankat., 2002). With the advent of CoronaVirus Disease (COVID-19) pandemic, the problem of student attention and motivation was increased many folds due to the shift to online teaching and learning. Within a very short time, digital technology applications gained a hype to overcome this problem. There is a dire need to adapt to the technological advances in medical education to cope with these issues.

There is a well-known saying that Assessment drives learning and regular formative assessment supports and enhances student engagement and behaviors (Hughes et al., 2020). If assessment is made interesting with gamification, it can further increase student engagement and motivation and problem of boredom and distraction in lectures can be minimized to some extent. Özhan and Kocadere. (2020) reported that use of games in online education had a significant effect on motivation of students. Although much work has been done but different gamification tools suit different situations and cannot be generalized to the whole education system. There is yet a need to evaluate which type of gamification is effective in our system and that can only be identified by extensive research on different tools.

One of the game based application to increase student attention and motivation, in online education, is Kahoot. It is an online game-based formative assessment tool, which has been very extensively used during the COVID-19 lock downs. The benefit of using this tool is that it makes learning fun by rewarding students who answer correctly with higher scores and bring them to the top of the ranking list. The results are shown in real time as the game progresses, thus stimulating student participation. Another feature of Kahoot is comparison with peers and also with their own performance in the real time and an additional audio-visual feature.

A good number of studies were undertaken on the use of Kahoot, but a solid evidence based on the motivational theories is still lacking regarding its proper use and adaption. Secondly, the evidence from these studies is mixed and the results of the representative samples could not be generalized to all the subjects and in all countries around the globe. Furthermore, majority of the studies were focused on the use, outcome scores, and perceptions of the students regarding learning with the application of Kahoot. There is a need to do a comparative study to see the effect of Kahoot on the motivation of students using a real time motivation assessment tool, for which this study was planned.

Situational Motivation Scale is one of the tools for real time assessment of motivation. It is feasible and efficient to assess the students' engagement and motivation for active participation during online teaching. Use of this scale in comparative studies of Kahoot and its effect on motivation of students in medical education is still void in literature. The rationale of this study was to compare the real time motivation of the students with use of Kahoot and without Kahoot in online lectures. The results can

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be helpful in adaption of this tool in our part of the world.

## METHODS

We planned a quasi-experimental study design at the Department of Ophthalmology in Ameer ud din Medical College (AMC). Approval was taken from the ethical review board of Ameer ud din medical college (Ref no. 00-63-22). Fourth year MBBS students were recruited to participate in this research. Two online lectures were planned; first was without use of Kahoot and the other lecture was with the use Kahoot at the end of lecture. To rule out the bias caused by difference in difficulty of the topic, both the lectures were on the same unit of Ophthalmology (Cornea). One day before the lectures (with and without Kahoot), the details of the research were shared with the students on Whatsapp group. Participation was entirely voluntary. Participation in the study was considered a consent from the students. Sample included all the fourth year students of AMC (over the age of 18 years), who were willing to participate in the research. After the lectures, the students were asked to fill the Situational motivation scale (SIMS), which is a pre-tested questionnaire (Guay et al., 2000).

SIMS questionnaire was presented to the students via a google forms link. The students were requested to fill the questionnaire in 10-15 minutes after the lecture. The forms were kept anonymous. SIMS measures Intrinsic motivation, Identified regulation, External regulation, Amotivation and Autonomous motivation index (intrinsic motivation + identified regulation). There are 16 questions which are answered on a 7-point Likert scale (1="Does not correspond at all" and 7="Corresponds exactly"). The process was repeated after one week with Kahoot at the end of lecture and SIMS was used to measure motivation. The scale has no specific cut-off values. So, the comparison was made between the lectures with Kahoot and without use of Kahoot.

Median was calculated for Intrinsic motivation from Questions (1, 5, 9 and 13), Identified regulation from questions 2, 6, 10 and 14, External regulation from questions 3, 7, 11 and 15 and Amotivation from questions 4, 8, 12 and 16. To evaluate the significance of using Kahoot, independent t-test was applied to compare between the two groups. The mean, median, minimum, maximum and standard deviation were calculated from median score of above variables.

## RESULTS

Age of the students was more than 18 years. Seventy four students appeared in the lecture without Kahoot and seventy six in the lecture with Kahoot. Proforma was kept anonymous for name and gender. Independent t test was used to find the significance in median scores. Table 1 shows the minimum, maximum and median values for these parameters. Table 2 shows comparison between the lectures with Kahoot and without Kahoot (control). It shows that intrinsic motivation, identified regulation and autonomous motivation index were significantly greater in Kahoot group as compared to the control. However, external regulation and Amotivation were greater in lectures without Kahoot ( $p < 0.05$ ).

**Table 1.** Minimum, maximum and median values of variables in control and Kahoot group

	Group	Intrinsic	Identified	External	Amotivation	Autonomous
Control	N	74	74	74	74	74
	Minimum	1.00	1.00	4.00	1.50	2.00
	Maximum	4.00	6.00	7.00	7.00	10.00
	Median	2.0000	4.0000	6.0000	4.5000	6.0000
Kahoot	N	76	76	76	76	76
	Minimum	2.50	1.00	1.00	1.00	5.50
	Maximum	7.00	7.00	7.00	6.50	14.00
	Median	5.0000	4.5000	5.0000	3.0000	8.5000
Total	N	150	150	150	150	150
	Minimum	1.00	1.00	1.00	1.00	2.00
	Maximum	7.00	7.00	7.00	7.00	14.00
	Median	3.0000	4.5000	5.5000	4.0000	7.5000

**Table 2.** Comparison between the lectures with Kahoot and without Kahoot (control) group

Situational motivation	Kahoot Group		Control Group		p Value
	Mean	SD	Mean	SD	
Intrinsic motivation	4.88	1.416	2.07	0.890	0.000
Identified regulation	4.71	1.749	4.04	1.395	0.010
External regulation	4.467	2.142	5.797	0.8833	0.000
Amotivation	3.40	1.93	4.64	1.500	0.00
Autonomous motivation index	9.59	2.812	6.11	1.96	0.000
(intrinsic motivation + identified regulation)					

## DISCUSSION

This SIMS is based on the Self-Determination Theory according to which, there are two types of motivation; intrinsic motivation and extrinsic motivation (Deci and Ryan., 2008). As the name implies, intrinsic motivation is from inside. While extrinsic motivation is related with the behavior based on external sources and leads to external rewards (Deci and Ryan., 1987). Extrinsic motivation has different levels; external regulation (motivation is entirely external and regulated by punishments and external rewards), introjected regulation (it is external to some extent but driven by self-control), identified regulation (it is partially internal but based on values which are important to one self, integrated regulation (it is intrinsic and self-awareness guides one's behavior). In SIMS, we evaluated intrinsic motivation, Identified regulation, external regulation, amotivation and autonomous motivation index after use of Kahoot.

Our results showed that the lectures with Kahoot had a positive effect on motivation scores of the students as compared to the lectures without Kahoot. Our results are similar to the results published by Youhasan and Raheem. (2019). In his study, more than 90 % participants agreed or strongly agreed that Kahoot provided fun during learning. It increased motivation and was an effective way for active learning and providing feedback. During 2020, due to the pandemic, use of gamification tools has

increased manifolds (Nieto-Escamez and Roldán-Tapia., 2021). This was due to the reported boredom in online learning, which was tackled by using different online tools to keep students engaged and motivated (Derakhshan et al., 2021).

Experience with Kahoot was studied in different medical specialties. In one study with teaching Pathology, Kahoot was found feasible and efficient way to increase students' engagement and active participation during the class (Neureiter et al., 2020). Calle et al. (2019) demonstrated the advantages of Kahoot over traditional teaching in the subject of Radiology. In a research at Singapore, third year students were included in a cross sectional descriptive study in which formative assessment was conducted in Pharmacology via Kahoot. A self-administered questionnaire was used to find out the students' experience. Approximately 95 % students were of the view that Kahoot motivated learning, was effective in giving feedback and should be used for future formative assessment (Youhasan and Raheem., 2019). All these studies were different from our study because our study was in Ophthalmology, we had a control session without Kahoot and SIMS was used to assess intrinsic and extrinsic motivation.

There was a time when bringing mobile in classrooms was regarded as a negative behavior. However, in a review article by Nikou and Economides. (2018), it was seen that mobile assessment had a significant positive impact on performance of the students, their attitude towards learning and motivation. This negative perception still persists in the minds of some teachers and has to be addressed and further investigated. Due to this attitude, conventional lecture-based learning practices are still popular among some medical teachers, especially those of the third world countries (Javed et al., 2022). In the modern medical education, more stress is being placed upon maximizing knowledge retention, reducing lapses in attention and increasing the students' intrinsic motivation. Kahoot has been a game changer in this respect.

According to Wang, the success and popularity of Kahoot is due to its fun based learning (Wang and Tahir., 2020). Kahoot keeps the motivation high throughout the assessment as it gives real time scores of the participants and continues to update the ranking. Another advantage is that it can be used on mobile phones as well as computers (Nkhoma et al., 2018).

Kahoot has also been studied to see the effect on student scores (Suryandari and Subagio., 2022). Some authors have evaluated the impact of using Kahoot on the grades of final exams as well (Martín-Sómer et al., 2021). The positive results were further endorsed by Vranesic. (2019), who found that use of Kahoot in lectures increased motivation and student achievement index. In another quasi experimental research of pre-post test design without control, it was seen that there was a significant difference between Kahoot (Pre Test) and Learning Evaluation (Post Test) (Suryandari and Subagio., 2022). Kahoot has changed the traditional learning style of didactic lecturing.

In another study, medical students' participation and experience was explored by Focus group discussions (Muhd Al-Aarifin et al., 2019). The participants had been a part of at least three Kahoot sessions and problem-based learning (PBL) groups were developed. According to this study, Kahoot was found to

have all the seven elements of the persuasive architecture of gamification; Goal setting, capacity to overcome challenges, provision of feedback, re-enforcement, comparison of progress, social connectivity and fun.

Comparison between different gamification tools was made by Lestari. (2019), who compared Kahoot with Quiz and Quiz was found to be more motivating. Another study compared the use of Kahoot between face-to-face and online classes. Learner perceptions of 174 first-year medical and health science students from an Australian university were enrolled.

One group was exposed to face-to-face and the other group to online learning using Kahoot. The activity consisted of one-hour physiology lecture followed by Kahoot interactive quiz. A survey was conducted after the quiz. There was no statistically significant difference between experiences of the two groups. This study proved the equal effectiveness of Kahoot as an engaging and motivating tool for learning (Phelps and Moro., 2020). Although majority of the users of Kahoot had described the positive student outcomes by using it, few negative aspects were also described by (Donkin and Rasmussen., 2021). These include increased time in its preparation, and distractions caused by the use of mobiles during class. In our part of the world, internet availability is also an issue in the peripheral areas of the cities where use of Kahoot cannot be implemented.

## CONCLUSION

Kahoot is a good online tool to increase motivation of students in online lectures. It makes learning fun by rewarding students with higher scores.

As there is no comparative study with Kahoot regarding effect on motivation using SIMS, this research will add evidence to the existing literature that Kahoot when added to lecture in general and in online lectures in special, leads to increased motivation. In a country like Pakistan where we face inertia of not accepting the change, this study will have its impact to bring a positive change in the traditional method of learning and teaching in medical education.

## LIMITATIONS OF STUDY

This study included students of a single class of MBBS and less than 100 students participated. Multicenter studies with larger sample size is recommended. We included only under graduate students. The same tool can be used in post graduate studies to see the effect on the motivation of residents. We had to use the paid version of Kahoot which is a limitation for further continuation of the research as the subscription of the application has to be renewed every year.

## DECLARATION OF INTEREST

The authors declare no conflict of interest.

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## AUTHOR'S CONTRIBUTION

**1.T.M:** Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work.

**2. R.A:** Drafting the work or revising it critically for important intellectual content.

**3. N.A:** Final approval of the version to be published.