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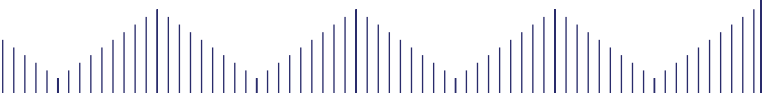
PRE-CLINICAL YEAR MEDICAL STUDENTS' PERCEPTION ON THE USAGE OF KAHOOT! QUIZ CHALLENGE AS POST-PBL ASSESSMENT

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Abstract: Formative assessment is an important tool to gauge the competence and performance of a medical student. This type of assessment enable the students to identify their strengths and weaknesses in order to improve their learning. The feedback given to students will motivate them to achieve their learning goals. The advancement of technology increases the usage of online-based assessment as it is more relevant and appealing especially to the younger generation. Online-based assessment such as Kahoot! offers immediate feedback and enhances the students' critical thinking and problem solving skills in a fun environment. These skills are important to be assessed especially following Problem-based Learning (PBL) sessions. PBL is adapted in many medical schools worlwide. Due to the nature of extensive learning objectives in PBL, it is important to have a practical formative assessment like quizzes in Kahoot! platform to assess the students' understanding. This study investigates the pre- clinical medical students' perception about Kahoot! quiz challenge as a formative assessment tool following PBL sessions.

Summary of work: Kahoot! quiz challenge was done following the completion of the second session of PBL in pre-clinical medical students. The quiz consisted questions related to the learning objectives of that particular PBL session from various subjects. At the end of the year, an online survey was carried out on the pre-clinical medical students on their perception of Kahoot! quiz challenge following PBL sessions. The modified validated questionnaire used has 12 items related to the students' perception on Kahoot! quiz challenge. Each item consists of 5-point scale; ranging from 1 (strongly disagree) to 5 (strongly agree) in which the students must rate each item. The data were then analysed, descriptive statistics and Mann-Whitney test was performed.

Summary of results: A total of 243 students participated in this survey with a majority of female respondents (76.1%). All the items in the survey has the median score of 4 in which the students agree that Kahoot! quiz challenge helped them to focus on the subjects, motivates them to learn, enhances their understanding, simplifies complex subjects and facilitates learning. The students also agreed that Kahoot! quiz challenge is fun, more engaging and is effective in providing feedback.

Conclusions: Kahoot! quiz challenge is useful as a formative assessment in PBL. It helped the students' understanding and also motivated them to learn.

Keywords: *Assessment, Formative, Kahoot!*

INTRODUCTION

In medical schools, assessment has been an important tool to gauge the competence and performance of medical students. One of the goals of such assessment is to optimize the students' capabilities by providing direction and motivation for their future learning (Epstein, 2007). This goal is achieved by formative assessment in which feedback is provided to the students to help them learn effectively (Dixson & Worrell, 2016). Another type of assessment is summative assessment; where the students are assessed on how much they have learnt or retained at the completion of a learning course (American Educational Research Association, 2014). Formative assessment is important to improve teaching and learning and to identify the students' difficulties in learning (Dixson & Worrell, 2016). This type of assessment is practical; as it is more closely tied to the teaching outcomes of the lecturers and it has a potential to refine a student's learning (Baleni, 2015). It is used as a feedback in the classroom aiming to advance teaching and learning and to develop learning goals (Taras, 2005). This feedback may address various issues such as the running of the assignment or programme, performance of the students and the improvement of the learning process itself (Fluckiger et al., 2010). This formative feedback may come from the instructor as well as from self or from peers (Smith, 2007). Paper-based quizzes/questions is one of the tools in formative assessment but with the age of digitalization, online-based assessment is more relevant and more appealing especially to the younger population.

Online-based assessment provides immediate feedback as compared to the traditional classroom method and the immediate generation of comprehensive feedback and scores aids the students in finding a solution for their problems. These features of online-based assessment offer an attractive learning features for the students (Baleni, 2015). Some of the online-based assessment is game-based; in which students are enticed by the competitiveness of the game. Using digital games, students are able to use their critical thinking, problem-solving skills and addresses their success and failure in a fun way (Dellos, 2015). One of the popular game-based platform is Kahoot!.

Kahoot! is free, easy to use for the students and simple for the instructors. It can be assessed via various devices such as smartphones, tablets or laptops with a stable internet connection. Its interactive interface with music and colours excite the students and encourage them to focus (Plump & LaRosa, 2017). A successful educational game needs to have the right context, cognitive activities, meaningful challenges and provides feedback (Plump & LaRosa, 2017) and these features are offered by Kahoot!. Thus, Kahoot! quiz challenge may serve as a formative assessment tool such as in Problem- based Learning (PBL) type of learning due to its ability to offer feedback to aid learning.

PBL is one of the learning methods adapted by many medical schools worldwide as it promotes critical thinking and problem-solving in real life learning situation (Yew & Goh, 2016). PBL may also promotes good communication and teamwork. A PBL case encompassed various topics from different subjects and may have a long list of learning objectives which may be overwhelming to the students. Due to the extensive learning objectives, the students may not be able to address them in detail. Hence, it is important to develop a formative assessment for PBL in which the learning objectives are addressed and assessed.

Learning style for each individual is unique. They may have their preferred learning styles such as visual learning, auditory learning, reading-writing learning and kinesthetic learning (Wehrwein, 2007). There was conflicting reports on the learning styles between males and females in terms of multimodal and unimodal learning style (Wehrwein, 2007, Slater, 2007, Choudhary, 2011). Therefore, in this study, our aim was to assess the

students' perception on the usage of Kahoot! quiz challenge as post-PBL session assessment and to further assess the findings based on gender.

METHOD

2.1   Context

During the academic year of 2018/2019, the Deputy Dean of Academic, Faculty of Medicine (FoM), Universiti Teknologi MARA (UiTM) initiated Kahoot! quiz challenge as a formative assessment tool post-PBL in pre-clinical years. Questions were designed according to the learning objectives of each PBL cases. Kahoot quiz challenge was opened to student for a limited time window after each 2nd PBL session. Top three winners after each challenge were awarded with a small token of appreciation. On top of that, the top three winners for highest accumulated points were also awarded with gifts at the end of the semester. As this initiative was recently commenced, student perception on the usage of Kahoot quiz challenge as post-PBL session assessment is important.

2.2   Study instrument

Modified questionnaire based on Ismail et al. (2017) was used in this study. Face validation of the modified questionnaire was done through a discussion with ten, randomly picked year 1 and year 2 undergraduate students from FoM UiTM. They were asked to complete the modified questionnaire and they were shown the original questionnaire by Ismail et al. (2017). After completion of the modified questionnaire, they were interviewed regarding their comprehension and understanding of the said questionnaire. They were also probed if they have misunderstood any of the questions. All the students understood the modified questionnaire better compared to the original questionnaire.

2.3   Data collection

Participants for this study were year 1 and year 2 undergraduate students of academic year 2018/2019 from FoM UiTM who participated in at least one Kahoot post-PBL quiz challenge throughout the academic year. The questionnaire was distributed through an online survey (Google form).

2.4   Data analysis

The collected data was transferred into SPSS version 23.0 and inferential analysis was performed using the nonparametric Mann-Whitney test.

RESULTS AND DISCUSSION

PBL has been adopted in FoM UiTM since its inception in 2003. In PBL sessions, students learn by discussing a case/problem in small groups and usually is supervised by a facilitator. There are two PBL sessions held per case/problem, where in the first PBL session, triggers were given and discussed. Several learning issue pertained to the learning objective of the PBL case will be recognized during the first PBL session. Students are expected to find the resources on the learning issues at home and to discuss them during the second PBL session. However, students may be overwhelmed with the vastness of learning objectives of PBL (Valaitis et al., 2005), and therefore, it is important to have some sort of assessment at the end of PBL sessions.

Currently, incorporating game-based apps in teaching-learning sessions is considered as one of strategies to invigorate learning (Telner et al., 2010). Game-based apps such as Kahoot! provide refreshing and exciting technique for students on top of providing them better understanding towards their learning objectives (Ismail et al., 2017). In this study, we assessed students perception on the usage of Kahoot as the assessment` tool in post-PBL session. A total of 243 students from Year 1 and 2 responded in the survey. From this number, 189 students had participated in at least one Kahoot! quiz challenge and 54 of the respondents have never participated in Kahoot! quiz challenge. Table 1 showed the most common cited reason for not participating. Majority of the students procrastinate in joining the quiz challenge which later make them fail to complete the challenge within stipulated time. Procrastination is a common attitude among university students and this may lead to negative effects towards their academic achievements (Hussain & Sultan, 2010). Improvement could be made by giving the students time to do quiz challenge before ending the PBL sessions in the future. Students may participate more when they perceive it as a compulsory task (Gafni & Geri, 2010).

Table 1. Most common reason given for not participating

Reason	Percentage (%)
Students' attitude (procrastinating, uninterested)	67
Issues with smartphone	25
Issues with internet connection	8

Among those who participated with the survey, female students made the majority of the respondents with 76.1%. This correlated with the ratio of the student population in FoM UiTM which is around 3 male students to 7 female students.Table 2 showed the median score for each item in the survey. All the items in the survey had a median score of 4, indicative of positive feedback. It showed that Kahoot! helps the students to focus, enhance understanding, facilitate learning and motivate them to learn. They also agreed that learning with Kahoot! is fun, a better e-learning platform and effective in providing them feedback. Comparison of mean score between gender (Table 3) and the year of study; Year 1 and Year 2 (Table 4) showed no significant difference in the way students' perceived Kahoot! quiz challenge post PBL.

Table 2. Median score of the items in the survey

Item	Median (IQR)
Kahoot! helps me to focus on the subjects related to the PBL sessions	4 (2)
Kahoot! enhances my understanding on the subjects related to the PBL sessions	4 (1)
Kahoot! facilitates my learning on the subjects related to the PBL sessions	4 (1)
Kahoot! is an effective method to correct my misconception on the subjects related to the PBL sessions	4 (1)
Kahoot! simplifies the complex subjects	4 (2)
Kahoot! helps to retain my knowledge	4 (1)
Kahoot! motivates me to learn more	4 (1)
Kahoot! is an effective method to provide feedback (track my performance & limitation of my knowledge)	4 (1)
I'm more engaged with feedback through Kahoot!	4 (2)
Learning with Kahoot! is fun	4 (1)
Kahoot! is a better platform than other e-learning (such as Google classroom, Ed puzzle, Quizziz, Socrates, Padlet) for feedback to students	4 (1)
Kahoot! is an effective method for reflective learning	4 (1)

Table 3. Comparison of median score between males and females

Item	Median (IQR)		z-Statistic	P value
	Male	Female		
Kahoot helps me to focus on the subjects related to the PBL sessions	4 (2)	4 (2)	-0.273	0.785
Kahoot enhances my understanding on the subjects related to the PBL sessions	4 (1)	4 (1)	-0.854	0.393
Kahoot facilitates my learning on the subjects related to the PBL sessions	4 (2)	4 (1)	-0.686	0.493
Kahoot is an effective method to correct my misconception on the subjects related to the PBL sessions	4 (2)	4 (1)	-0.516	0.606
Kahoot simplifies the complex subjects	4 (2)	4 (2)	-0.754	0.451
Kahoot helps to retain my knowledge	4 (1)	4 (1)	-0.120	0.904
Kahoot motivates me to learn more	4 (1)	4 (1)	-0.409	0.683
Kahoot is an effective method to provide feedback (track my performance & limitation of my knowledge)	4 (1)	4 (1)	-0.625	0.532
I'm more engaged with feedback through Kahoot	4 (2)	4 (2)	-0.970	0.332
Learning with Kahoot is fun	4 (2)	4 (1)	-1.413	0.158
Kahoot is a better platform than other e-learning (such as Google classroom, Ed puzzle, Quizziz, Socrates, Padlet) for feedback to students	4 (1)	4 (1)	-0.769	0.442
Kahoot is an effective method for reflective learning	4 (1)	4 (1)	-1.114	0.265

Table 4. Comparison of median score between years of study

Item	Median (IQR)		z-Statistic	P value
	Year 1	Year 2		
Kahoot helps me to focus on the subjects related to the PBL sessions	4 (1)	4 (2)	-0.771	0.441
Kahoot enhances my understanding on the subjects related to the PBL sessions	4 (1)	4 (2)	-0.578	0.564
Kahoot facilitates my learning on the subjects related to the PBL sessions	4 (1)	4 (2)	-0.512	0.609
Kahoot is an effective method to correct my misconception on the subjects related to the PBL sessions	4 (1)	4 (2)	-1.089	0.276
Kahoot simplifies the complex subjects	4 (1)	4 (2)	-0.783	0.433
Kahoot helps to retain my knowledge	4 (1)	4 (1)	-0.549	0.583
Kahoot motivates me to learn more	4 (1)	4 (2)	-0.588	0.556
Kahoot is an effective method to provide feedback (track my performance & limitation of my knowledge)	4 (1)	4 (1)	-0.366	0.714
I'm more engaged with feedback through Kahoot	4 (2)	4 (2)	-0.399	0.690
Learning with Kahoot is fun	4 (1)	4 (1)	-0.874	0.382
Kahoot is a better platform than other e-learning (such as Google classroom, Ed puzzle, Quizziz, Socrates, Padlet) for feedback to students	4 (2)	4 (1)	-1.165	0.244
Kahoot is an effective method for reflective learning	4 (1)	4 (1)	-0.338	0.736

Generation Z students, those who are born after 1995 till 2010, are the group of medical students nowadays. They have access to digital technology since they are born, hence, known as digital natives, and are accustomed to learning through mobile apps and technology (Shatto & Erwin, 2016). Therefore, they do appreciate game-based learning as it is interactive and able to provide immediate feedback (Table 2). Generation Z students rely much on immediate feedback as the way to enhance their understanding (Ding et al., 2017).

CONCLUSION

This study demonstrates that student have good perception on the usage of Kahoot! quiz challenge in post-PBL sessions by enhancing students' understanding, facilitating their learning and providing feedback to them. There was no difference in the perception among males and females students. More improvement could be incorporated in the process of implementation to get better and continuous participation from students.

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