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The Effect of Kahoot, Quizizz and Google forms on the Student's Perception in the Classrooms Response System.

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Abstract— **Kahoot, Quizizz, and Google Forms are learning technology opens for new ways of teaching in the classroom. The teachers' laptops connected to a video projector, access to wireless network and the students smartphones, tablets or laptops can be utilized to enhance the interaction between the teacher and students, as well as boost the students motivation, engagement and learning. This paper shows the results from investigating the effect of using Kahoot, Quizizz, and Google Forms in classroom on how the students' perception of concentration, engagement, enjoyment, perceived learning, motivation, and satisfaction. The results show that students learned something from doing the quiz via Kahoot, Quizizz and Google Forms. But, there are significant differences in the concentration, engagement, enjoyment, motivation, and satisfaction. Kahoot and Quizizz has presented a lot of positives over Google forms when used in the classroom.**

Keywords— **Kahoot, Quizizz, Google Forms, Active learning, Classrooms Response System.**

I. INTRODUCTION

Many changes have occurred in the 21st century requiring people's adaptation to new ways of doing things, which affected the lives of many people. The education system must develop and respond to the changes that happen. This is so different to the past when teaching and learning methods focused on content or knowledge than learning experience. Students are not just passive learning anymore, but they have to what so called "learning by doing" and pursuit knowledge by themselves (1). According to the learning pyramid, active learning method (discussion group, practice by doing and teach others) is more effective on the long term retention than passive learning method (lecture, reading, audio visual, demonstration) (2). Teachers will be a "Coach" to design the learning method and help the students to achieve. This includes nurse educators are challenged to use multiple techniques and innovative ways of teaching that maintain student's engagement and learning (3).

The use of interactive technologies in classroom has gained popularity in the last decade in response to an increasingly digital generation (4). These technologies appear in the literature under different names such as electronic voting systems, audience response systems, personal response systems, and classroom response systems (5). Classroom response system, a system that uses wireless handheld devices like smart phones and tablets to collect and aggregate student responses instantly then display the aggregated results in the class and gather immediate feedback in response to questions posed by instructors. There are three categories of activities and equipment involved in using a classroom response system: presentation and questioning, student response and display, and data management and analysis (6). Previous studies show a variety of positive outcomes such as; increased collaborative learning and engagement, increased student learning performance and recommend their use in educational settings to support the learning process (7).

Today, there are a lot of classroom tools or websites that teachers can create or share quizzes and polls during the class. Some examples of such tools are socrative, polldaddy, poll everywhere, kahoot, verso, classmaker, google forms, quizizz, etc. Many universities have adopted these tools for education. Wang, A. I.(2015) used kahoot in classroom teaching. The results showed that the students that did the kahoot (game-based quiz) learned 22% more than students that did paper quizzes and the students that used kahoot were 25% more motivated by the quiz compared to the paper quiz. (8) The NC State University surveyed about students perceptions of google forms to student learning and engagement. The results found that 70% of students answering the survey agreed or strongly agreed that google forms helped them learn course materials. 74 % of students agreed or strongly agreed that google forms as a classroom response system increased their engagement in the classroom (9).

From these studies would assume that the use of interactive technology in the classroom not only facilitates and enhances student learning, and the co-production of learning, but that it is also perceived as a beneficial augmentation to the traditional lecture format, and adds value to the students learning experience. In this study, we investigated kahoot, quizizz and google forms as the tools for classroom response system. Addressing these issues, our primary objective is to investigate the effect of kahoot, quizizz and google forms on student's learning experience. We propose that interaction between the teacher and the students and among students using kahoot,

quizizz and google forms affects student collaborative learning and enhance student learning experiences.

II. Material and Method

This section presents the research goal and research questions, the tools for classroom response system, the data sources, the participants, the research procedure, and the method for data analysis.

A. Research Goal and Research Questions

The research goal of this study was defined as the following using the Goal Question Metric (GQM) approach (10) where we first define a research goal (conceptual level), then define a set of research questions (operation level), and finally describe a set of metrics answer the defined research question (quantitative level).

The purpose of this study was to investigate how the use of kahoot, quizizz, and google forms affected the students' concentration, engagement, enjoyment, perceived learning, motivation, and the satisfaction.

The following research questions (RQs) were defined by decomposing the research goal:

RQ1: How is the students' concentration affected by kahoot, quizizz, and google forms?

RQ2: How is the students' engagement affected by kahoot, quizizz, and google forms?

RQ3: How is the students' enjoyment affected by kahoot, quizizz, and google forms?

RQ4: How is the students' perceived learning affected by kahoot, quizizz, and google forms?

RQ5: How is the students' motivation affected by kahoot, quizizz, and google forms?

RQ6: How is the students' satisfaction affected by kahoot, quizizz, and google forms?

B. Tools for classroom response system

- **Kahoot**

  Kahoot is a game-based student response system being a result of the Lecture Quiz research project project initiated in 2006 at the Norwegian University of Science and Technology (NTNU). Kahoot provides a tool for creating quizzes including adding pictures and YouTube videos to the questions. It also makes it possible to publish and share your own quizzes, and edit quizzes made by others. When playing Kahoot in the classroom, the teacher has to launch kahoot in a web browser on the laptop which must be connected to a large screen. It is important that all the students are able to clearly see what is being displayed from the teacher's laptop. On the launch screen the students are asked to open the URL *kahoot.it* in a web-browser on their own devices. The students are not required to have an account to play. To enter the game, they must enter a game pin and a nickname. (Fig.1).

Fig. 1 shows how to enter the kahoot
(http://www.wearehuman.cc/img/investments/kahoot.png)

While playing the quiz, the question along with the answers are shown on the large screen, and the students click/press the same color and symbol as the answer they believe is the correct one. On the screen a timer will count down to zero as well as the number of students that have answered is shown. During the quiz, kahoot uses a playful graphical user interface as well as music and sounds to give it a playful and competitive atmosphere similar to a game show on TV. (Fig. 2)

Fig. 2 shows how students give their answers in kahoot
(https://getkahoot.com/how-it-works)

Between every question, a distribution of how the students answered is shown before a scoreboard of the five best players. The students get individual feedback on their questions in terms of correctness, the number of points, the ranking, how far the student is behind the student ranked above, and the correct answer if wrong answer is given. At the end of a kahoot session, the winner's nickname and points will be shown on the large screen (7,11).

- **Quizizz**

  Quizizz is a very similar to Kahoot, the teacher chooses a quiz to begin. A game code is provided. Players point their browsers to join.quizizz.com and input the game code, along with their names. Quizizz is a few key differences from kahoot. (Fig. 3). Kahoot is designed to show multiple choice questions on a large screen, and students respond by clicking buttons on their devices that correspond to the answers they want to choose. But quizizz takes a different approach. No projector is necessary because players see questions and answer options on their own screens. The question order

is randomized for each student, so it's no easy for players to cheat. With quizizz, players don't have to wait for the whole class to answer a question before they continue to the next one. Quizizz is player-paced, players don't have to wait for the whole class to answer a question before they continue to the next one while kahoot's pace is determined by the teacher or host. The class can stop and discuss after each question.

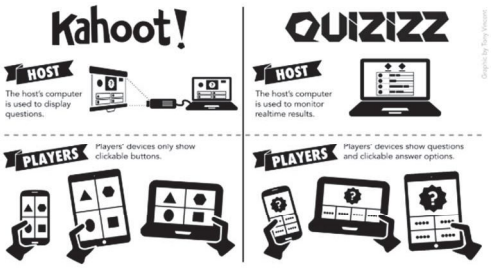

Fig. 3 shows how quizizz difference from kahoot (http://learninginhand.com/blog/quizizz)

When you host a quizizz game, you get to see a real-time view of the game's results. Quizizz shows the total number of questions that have been answered correctly and incorrectly. Quizizz also displays real-time progress bars for each player. At a glance you can see how many questions a player has got right, answered incorrectly, and have left to answer. (Fig. 4) Other option, quizizz can be assigned as homework while kahoot can be played only real-time. (12)

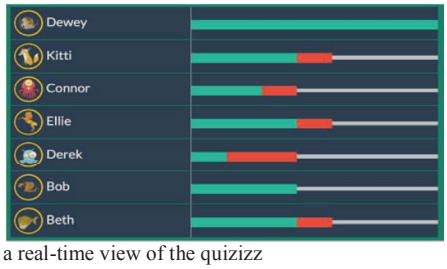

Fig. 4 shows a real-time view of the quizizz (http://learninginhand.com/blog/quizizz)

- **Google Forms**

Google Forms is an integrated web-based application that facilitates the design of online surveys, questionnaires, and quizzes with a user-friendly application programming interface (API). There is another classroom assessment tool that the teacher can push out a number of questions through the form, in survey-like format. The student responses can then be compiled into a spreadsheet for analysis, differentiation and informed teaching (Fig 5). The teacher can also incorporate conditional formatting into the spreadsheet by adding colored background to the wrong answers so they can instantly identify student that are getting on well and the ones that are struggling and will be needing intervention (13).

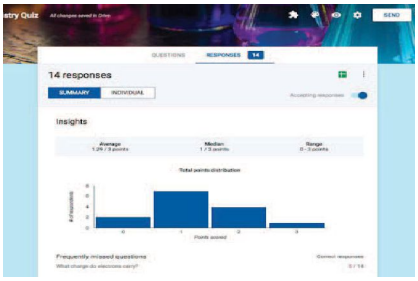

Fig. 5 shows immediate feedback on quizzes (https://blog.google/products/docs/give-feedback-faster-with-quizzes-in)

C. Data sources

A questionnaire was developed to measure the students' concentration, engagement, enjoyment, perceived learning, motivation, and satisfaction. The questionnaire consisted of eight statements reflecting the research questions RQ1-RQ6 (Table1). The questionnaire used a three-point Likert scale from disagree (1), neutral (2), and agree (3). In addition, we used observations at the end of the semester.

D. Participants

The research was conducted at Faculty of Nursing, Chiang Rai College in Chiang Rai, Thailand. The samples were taken from 121 students; they were attending gerontological nursing course. They were in their first semester. They attended classes 2 days a week for 4 hours.

E. Procedures

The teachers were to standardize their course material (e.g. lectures and PowerPoint slides). In one semester, each of the class was given 4 multiple choice quizzes, with 10 questions per quiz. The marks for each quiz were 5% from their total course marks. The arrangement of all sessions was always the same. In class, the teacher explained the topic then posed 10 questions related to the topic on Kahoot, Quizizz or Google Forms. Students were supposed to answer them individually. The teacher collected all the answers of the students and pinpoint questions in which there is a major difference of opinions. Later, teacher and students discuss their answers together. (Fig. 6)

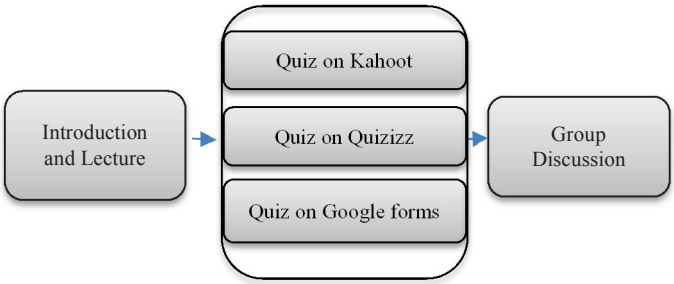

Fig. 6 shows a procedures

F. Data analysis

The Kruskal-Wallis test was ran on the data from the questionnaire to investigate the differences between the responses from the three groups Kahoot, Quizizz, and Google Forms. The Kruskal-Wallis test is a nonparametric test for the significance of the differences among the distributions of in our case three independent samples of difference sizes.

III. RESULTS

This section presents the results from the questionnaire to investigate the differences between the responses from the three groups Kahoot, Quizizz, and Google form. In the analysis we looked at students' concentration, engagement, enjoyment, perceived learning, motivation and satisfaction. Note that the descriptive statistics has summarized into the three categories agree, neutral and disagree.

RQ1: Effect of Concentration

Table I shows the descriptive statistics and the results from the Kruskal-Wallis test for statements related to concentration. The results show that there is a statistically significant difference in how kahoot, quizizz, and google forms kept the students concentration during the lecture. When kahoot were used, 83% agreed that the quiz kept on their concentration during the lecture, compared to 52-64 % when google forms and quizizz were used. Interestingly, there is also a tendency that this effect is stronger when kahoot were used in the classroom.

Table I. Results on concentration

Statement	Group	Agree	Neutral	Disagree	P
1. The quiz kept my concentration during the lecture.	Kahoot	83%	17%		0.000
	Quizizz	64%	36%		
	Google forms	52%	47%	1%	

RQ2: Effect of Engagement

Table II shows the descriptive statistics and the results from the Kruskal-Wallis test for statements related to engagement. The results show that there is a statistically significant difference in how kahoot, quizizz, and google forms on the students' perception of engagement. When kahoot were used, 86% agreed that the quiz encouraged their engagement while doing, compared to 62-74 % when google forms and quizizz were used.

Table II. Results on engagement

Statement	Group	Agree	Neutral	Disagree	P
2. The quiz encouraged my engagement while doing.	Kahoot	86%	14%		0.000
	Quizizz	77%	23%		
	Google forms	62%	36%	2%	

RQ3: Effect of Enjoyment

Table III. shows the descriptive statistics and the results from the Kruskal-Wallis test for statements related to enjoyment. The results show that there is a statistically significant difference in how kahoot, quizizz, and google forms on the students' perception of enjoyment. A smaller percentage of the students who used a quiz with google forms agreed that the quiz was fun and more interesting (55%) compared to quizizz and kahoot (78-87%) (Statement 3). Interestingly, there is also a tendency that student enjoyed learning more while playing the quiz with kahoot (91%), compared to the other groups (62-74%) (Statement 4).

Table III. Results on enjoyment

Statement	Group	Agree	Neutral	Disagree	P
3. The quiz was fun and more interesting.	Kahoot	87%	13%		0.000
	Quizizz	78%	22%		
	Google forms	55%	44%	1%	
4. I enjoyed learning more while doing the quiz.	Kahoot	91%	9%		0.000
	Quizizz	74%	26%		
	Google forms	62%	35%	3%	

RQ4: Effect of Perceived learning

Table IV shows the descriptive statistics and the results from the Kruskal-Wallis test for statements related to perceived learning. The results show that there is a statistically significant difference in how kahoot, quizizz, and google forms on the students' perception of perceived learning. A smaller percentage of the students who used a quiz with google forms agreed that the quiz was encouraged thinking and solving (62%) compared to quizizz and kahoot (75-76%) (statement 5). However, the results is no statistically significant difference in how the students perceived that they learn something from doing the quiz (statement 6).

Table IV. Results on perceived learning

Statement	Group	Agree	Neutral	Disagree	P
5. The quiz encouraged thinking and solving.	Kahoot	76%	24%		0.023
	Quizizz	75%	25%		
	Google forms	62%	37%	1%	
6. I learned something from doing the quiz.	Kahoot	77%	22%	1%	0.141
	Quizizz	73%	27%		
	Google forms	66%	34%		

RQ5: Effect of motivation

Table V shows the descriptive statistics and the results from the Kruskal-Wallis test for statements related to motivation. The results show that there is a statistically significant difference in how kahoot, quizizz, and google forms on the students' perception of motivation. A smaller percentage of the students who used a quiz with google forms agreed that the quiz motivated about learning and wished the quiz should be used in other classes (61%) compared to quizizz and kahoot (73-78%).

Table V. Results on motivation

Statement	Group	Agree	Neutral	Disagree	P
7. The quiz made me motivated about learning and I wish the quiz was used in other classes.	Kahoot	78%	22%		0.013
	Quizizz	73%	26%	1%	
	Google forms	61%	38%	1%	

RQ6: Effect of satisfaction

Table VI. shows the descriptive statistics and the results from the Kruskal-Wallis test for statements related to satisfaction. The results show that there is a statistically significant difference in how kahoot, quizizz, and google forms on the students' satisfaction. When kahoot were used, 85% agreed that they satisfied with the quiz for learning, compared to 61-70% when quizizz and google forms were used. Interestingly, there is also a tendency that this effect is stronger when kahoot is used in the classroom.

Table VI. Results on satisfaction

Statement	Group	Agree	Neutral	Disagree	P
8. Overall I am satisfied with the quiz for learning.	Kahoot	85%	15%		0.000
	Quizizz	70%	29%	1%	
	Google forms	61%	38%	1%	

IV. Discussion and Conclusion

In this article, we have presented an evaluating the different tools for classroom response system. Kahoot, Quizizz, and Google Forms were used throughout the lecture to facilitate questions and answers in the classroom. At the end of course, the students were asked to fill in the same questionnaire with statements related to concentration, engagement, enjoyment, perceived learning, motivation, and satisfaction. The Kruskal-Wallis test was used to test the hypothesis that variation in use of kahoot, quizizz, and google forms had a statistically significant difference for concentration (RQ1), engagement (RQ2), enjoyment (RQ3), motivation (RQ5), and satisfaction (RQ6). Kahoot and Quizizz has presented a lot of positives over Google forms when used in the classroom. This result also suggests that students perceive that Kahoot and Quizizz supports the learning and increases the student concentration, engagement, enjoyment and motivation. However, all of the tools were not difference in how the students perceived that they learn something from doing the quiz. In addition, it helped them to be aware of their level of knowledge and facilitates the understanding of the concepts and increases their learning process. Furthermore, students feel that their answers and opinions are given value by the teacher. It easy for teachers to check how many students understands the concept. A limitation, this study is not the experimental research. Therefore, further research would be to test two different student groups: classroom response system users and non-users and investigate on learning outcome. We strongly recommend the use of Kahoot and Quizizz in the class as a tool to enhance learning experience. We conclude that Kahoot and Quizizz improve students' level of interactivity, which helps student to be active in class and have collaborative learning, which also increases student engagement in the learning process.

V. Acknowledgement

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