Implementation of Quizziz as a Pretest and Post-Test to Evaluate the Effectiveness of Small Group Learning

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ABSTRACT

Background and aims: Since the Indonesia Covid-19 pandemic spread out in March 2020, the online learning method was applied in a professional medical program, and we started to use "Quizziz," an educational game online. The study aimed to evaluate Small Group Learning activity's effectiveness using "Quizziz" as pre-test and post-test.

Methods: This research was quasi-experimental one group pre-posttest design, involving 107 medical professional students of Indonesian Muslim university enrolled in SGL activity as an enrichment program before entering clinical departments in November 2020. The "Quizziz" was done before and after the SGL activity and statistically analyzed the result. The students were also asked to answer some survey questions about Quizziz performance.

Result: In this research, we found the mean of Quizziz pre SGL score was 54,93 (SE±1,448), and the mean of Quizziz post SGL score was 88,64 (SE±1,141). Because both data Quizziz pre and post SGL scores were normal distributions, we compared both statistically using t-paired student test. We found significantly different with p-value <0,001. The survey result confirmed 88,3% of the student said that The Quizziz's question was in line with SGL content, 87,9 % of students felt that The Quizziz improved their concentration, and 85,3% reported that The Quizziz helped them to understand SGL's subject.

Conclusions: Small Group learning activity in medical profession program was very effective in improving student knowledge when evaluated with the Quizziz application

Keywords: SGL, The Quizziz, a medical student.

1. INTRODUCTION

Medical education in Indonesia consists of the academic stage and the professional stage. According to the university's standard, medical students must complete 144 credits at the academic stage to obtain an undergraduate medical degree. The student should learn about primary medical science, normal organ physiology, disease pathomechanism, and disease treatment in this stage. While in the professional stage, medical students should practice the knowledge they already had in the stage before in real condition with a real patient. They should learn how to make a precise diagnosis through a good anamnesis, an adequate physical examination, choose and perform laboratory tests or other supporting examination and then give appropriate treatment. Good analytical thinking is also needed to achieve this goal. [1]

Unfortunately, many medical professional program students have experienced difficulties transforming their knowledge into a skill they should perform. So, we conduct an activity assisting a student in reviewing and

refreshing the knowledge about diseases studied in a particular clinical department called Small Group Learning (SGL). In this activity, medical professional students are given a brief review of diseases before they entered rotation in a particular clinical department. SGL has already been running for almost five years in Universitas Muslim Indonesia at medical faculty and seems to have a beneficial effect. However, an evaluation is still needed from time to time to assess SGL activities' effectiveness in increasing student knowledge.

After Covid19 struck the world in November 2019 and especially Indonesia in March 2020, there was a change in teaching and learning methods to become an online system. SGL activities are also carried out online using the Zoom meeting and Quizziz application before and after the SGL activity. Quizziz is a game-based educational online application designed to make users feel that studying is fun. By using Quizizz, students can do exercises on their electronic devices.[2] Unlike other educational apps, Quizizz has game characteristics such as avatars, themes, memes, and music to keep users entertained in the learning process. Quizizz also allows students to compete with each other and motivates them to learn.[3]

There was some publication about implementing the "Quizziz" application at all education levels to evaluate teaching and learning activities. These studies include a student from elementary school until university stage involving different faculty such as mathematics, language, and physics.[4][5] However, there is no research on Quizziz implementation in the medical professional program student yet. So, we are interested in conducting one. In this study, we would like to compare the Quizziz result as a pre-test and post-test to evaluate the SGL effectivity.

2. METHODS

This research was a quasi-experimental one-group pre-test-post test design with total sampling technic. We enrolled 107 medical professional education students who took part in the SGL activity in November 2020.[6] First, the participants underwent a pre-test and post-test by Quizziz application before and after the SGL activity. When students start to join quizziz, the questions and answers were randomized. Thus, there were no same questions among students. The score was given based on accuracy and speed. If the answer was correct, they gained 600 points and 0–400 points based on speed when the question timer was turned on or 1000 points if turned off. But if the answer was incorrect, they gained no score at all.[7] Apart from that, the SGL participants also filled out a survey about Quizziz implementation.

All data were analyzed using descriptive statistics and a paired t-test to evaluate the correlation between pre and post-test values.

3. RESULTS

There were 107 students included in this study, with 22% male and 78% female. The age range of participants was between 22-24 years old. The mean pre-test value was 54.93 (SE ± 1.448), and the mean post-test value was 88.64 (SE ± 1.141). Since the data result was normally distributed, we continued to analyze with a paired T-test, and the result of p-value was <0.001. The results showed 88,3% of Medical Professional Students stated that the Quizziz's questions were relevant to the SGL's subject. The results consisted of 87.9% of students indicating that quizziz improved their concentration, and 85.3 % of students confirmed that Quizziz helped them to comprehend SGL's subject.

Table 1. Quizziz score distribution

Quizziz score	Pre Tes (n MPPD)	Post Tes (n MPPD)
<25	1	0
26-50	39	0
51-75	47	22
76-100	20	85

Table 2. Mean of quizziz score and p-value p

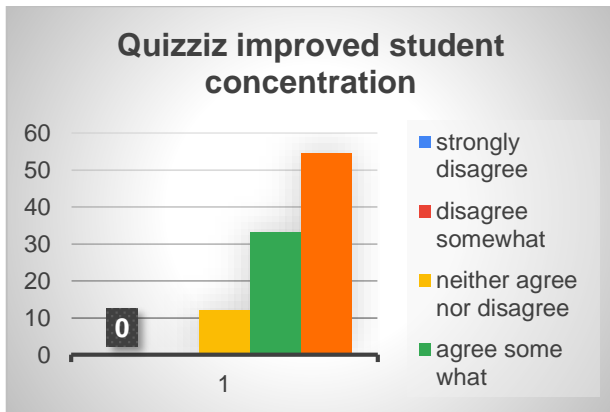| Mean pre-test	Mean post	-test p-value
54.93 (SE ± 1.448)	88.64 (SE ± 1.141)	<0,001

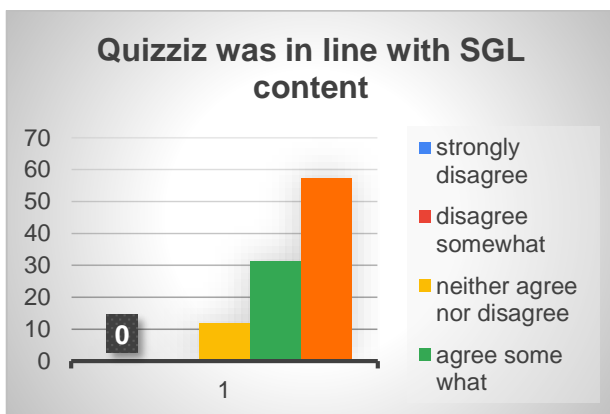**Figure 1.** Survey result of Quizziz improved student concentration

Figure 2 Survey result about Quizziz relevant with SGL content
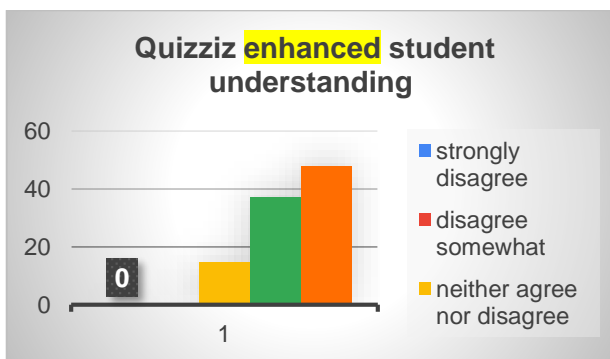

Figure 3. Survey result in Quizziz improve student's understanding

4. DISCUSSION

In this research, we found that the mean pre-test value was 54.93 (SE ± 1.448), and the mean post-test value was 88.64 (SE ± 1.141). Since the data distribution was normal, the statistical analysis was carried on through a paired T-test and obtained the p-value <0.001. This result means there was a significant difference in Quizziz's score before and after SGL activity, so we can conclude that SGL significantly improves student knowledge. This result is similar to the results reported by Hadimani, who studied the effectiveness of biochemistry learning in medical students using small groups.[8] Likewise, in line with Phenwan's research, the study found that pre-clinic students can get good scores on evidence-based medicine by learning in small groups. [9]

As a result of the Covid19 pandemic, there has been a change in the education system from offline to online using online applications, and Quizziz is one of them. The advantages of online learning appear in Namara D Mac et al. which concluded that online students incredibly showed an increase in the learning process both value and progress than those studied offline.[10]

Several studies have utilized Quizziz to evaluate the effectiveness of teaching and learning activities at all levels of education and various subjects. Purba et al. in 2019 employed Quizzis to assess the efficacy of teaching and learning activities in biochemistry courses.[11] Meanwhile, Hendarto et al. researched the use of quizzes in Nahwu science learning.[12]

The Quizziz application's advantages are free game-based learning, easy to create a multiplayer, and can be used on any device, such as laptops, smartphones, or tablets. After completing the Quizziz questions, students can see their rank on the ranking board [11]. So, this application is also able to motivate and engage students or users with the content.[13]

According to the survey results, 88.3% of medical profession's students approved that the Quizziz questions were relevant to the SGL material, 87.9% of students stated that Quizzis helped increasing concentration, and 85.3% of students stated that Quizziz assisted them in

understanding the SGL subject. Hendarto et al.'s study also obtained a similar result, in which 100% of participants perceived the Quizziz application's benefits in increasing their learning material comprehension.[12] Fang Zhou in 2020 has confirmed that the Quizziz application helped the learning process and enhanced students' interest in lessons. Even some students explained that the Quizziz application facilitated them to get used to answering questions, so they were not worried about undergoing exams.[7] Meanwhile, Purba (2019) found that the quizziz application can boost student concentration and motivation in studying physical chemistry courses.[11] Sou et al. also found that Quizziz raises student concentration in learning the Arabic language.[14]

In medical education, Dayal et al. conducted research that used Quizziz to upgrade student understanding of musculoskeletal system anatomy and found a positive result. [15] As far as we know, our study is the first study using Quizziz to assess the effectiveness of teaching and learning activities in medical students of professional programs. We found that using the Quizziz application in SGL activities provides many positive benefits in increasing professional program students' competencies.

5. CONCLUSIONS

Small-Group learning activity in the medical profession program effectively enhances student knowledge evaluated by Quizziz application.

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