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"Quizizz" as an evaluation of advanced natural science learning to increase concentration in post-pandemic learning

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Abstract: Switching online learning to learning face-to-face (FTF) post-Covid-19 pandemic in the Advanced Natural Science learning course needs good adaptation from the lecturer and student. Students are not yet fully ready to follow learning FTF. When they follow learning, students are not yet entirely focused on learning. This show that the learning concentration of students is low. This research was conducted to evaluate Advanced Natural Science learning post-Covid-19 pandemic. This study aims to determine whether giving quizzes with the application Quiziz affects students' learning concentration. This study uses a quantitative approach with a quasi-experimental method of research. This research design used the pretest-posttest group design. The sample from this study is 36 students 4th Semester Class A 2021/2022 academic year of Education for Islamic Elementary School Teachers (EIEST) with a random cluster sampling technique. The data were analyzed using the t-paired test. From the study, the Quizizz can be made for evaluation on Advanced Natural Science at learning FTF post-pandemic. Students in Advanced Natural Science courses could overcome the lack of concentration by giving quizzes using Quizizz. Besides increasing the learning concentration of students, giving quizzes with the application Quizizz also have several positive impacts. The effects were increased motivation to learn, improved spirit competition, and enhanced understanding of the material.

Kata Kunci: Quizizz, Advanced Natural Science Learning, Learning Concentration, Learning Evaluation, Post Pandemic

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INTRODUCTION

The world has already started to rise from the Covid-19 pandemic, including the world of education. Learning face-to-face (FTF) has gradually applied in schools (Halimah et al., 2022), including in several universities. Islamic State University Sunan Kalijaga Yogyakarta is one of the universities that have to apply to learn FTF starting from the even semester of the 2021/2022 academic year. The students and lecturers concerned can conduct offline or online learning on its implementation.

Advanced Natural Science Course is one of the compulsory courses in the Education for Islamic Elementary School Teachers (EIEST) of Islamic State University Sunan Kalijaga Yogyakarta. Based on the discussion among lecturers and students, implementing learning at Advanced Natural Science is already held offline/face-to-face.

Existence policy and implementation of learning FTF in Advanced Natural Science; this hope students become more active in following lectures. Learning by stare advance allows interaction between educators and participants (Pratama & Mulyati, 2020). Learning FTF allows two-way communication, making participants more active (Satriani, 2022). Using multimedia to improve students' critical thinking skills can be optimized if combined with appropriate learning models (Sari & Sugiyarto, 2015).

Advanced Natural Science Course consists of activity classroom learning and practicum. Activity Practice with Theory in class is related, so the teaching is more contextual. According to Kadir (2013), contextual learning makes the participant more active in connecting the theory with solving daily

problems. Activity practicum is done using equipment that can be found in our environment. Thereby students can be more enthusiastic and active in lectures. However, the facts show that at FTF Learning, the student was not busy enough. Several students saw the play on cell phones during the learning process in class. Several of them talk with another friend. There are also students whose eyes look blank when following the lesson.

The transition from online learning to FTF learning needs good adaptation from students and lecturers (Salim, 2022; Yanti & Fernandes, 2021). Online learning has high flexibility (Astutik et al., 2022; Rifa'ie, 2020; Ni'mah et al., 2021; Mufida & Widodo, 2021). Lecturers and students can set when and where learning occurs and what features to use. The existence FTF learning policy naturally needs adaptation again with changes that occur. At FTF learning, lecturers and students must meet on campus at the time and place that has been determined. This requires readiness both from lecturers and students.

Based on the Interviews, results with some students indicated that they felt sleepy and lacked focus during the Advanced Natural Science learning. Some others think it is challenging to concentrate, easily distracted by other things, and lack motivation to study. The problematic material makes it difficult for them to concentrate on understanding the material. Some students also said that they are getting used to online learning, so they need to adapt again when face-to-face. This is because lecturers have not implemented learning innovations in dealing with post-pandemic learning. This problem is a learning problem in the classroom. As stated by Priyayi et al. (2018), the concentration of learning is a learning problem for every student. Learning is needed to attract more students' attention so that their learning concentration increases. The method used is still the same as offline learning before the pandemic.

Even though the conditions are different, students are used to online learning. Students have started to feel comfortable with online learning, so they adapt to face-to-face learning again. New learning methods or innovations are needed so that students can concentrate more on concentration post-pandemic offline learning. This requires serious handling so students can participate well in Advanced Natural Science learning. As delivered by Aviana & Hidayah (2015) and Suwarni et al. (2016), the learning process determines the success of the learning process. The one that became key to success is concentration (Wulandari & Dewi, 2019). Student learning concentration is also an important variable affecting cognitive, affective, psychomotor, and scientific skills (Sihotang et al., 2021).

Problem Statement

Based on the facts found in the field, it can be seen that the problem in face-to-face learning after the Covid pandemic was a decrease in student learning concentration. Learning concentration focuses on all behaviors expressed in understanding, applying, and evaluating attitudes and values on the material (Aviana & Hidayah, 2015). According to Wulandari & Dewi (2019), concentration is focusing the mind on the tasks and ignoring the surrounding distractions.

According to Setyani & Ismah (2018), a concentration study consists of nine indicators, namely: 1) attention to learning material; 2) a response to the material being taught; 3) the emergence of body organ responses according to the teacher's instructions; 4) apply the acquired knowledge; 5) analyze the acquired knowledge; 6) express ideas; 7) able to recall the knowledge possessed; 8) interest in the subjects studied; 9) through learning without feeling bored. According to Sihotang et al. (2021), indicators of learning concentration consist of attention, understanding, liveliness, precision, and serenity. According to Indrawati et al. (2021), the indicator is a readiness to accept information, ability to interpret material, knowledge to respond to the material, express opinion, pay attention to the learning process, respond to instructions, and be active in learning. The indicator of learning concentration in this research covers readiness to accept learning, attention to the learning material, activity to express an opinion, response to instructions, and abilities to respond to the material.

Novelty

Assessment is an activity that helps in developing student learning. Assessment provides an opportunity for educators to evaluate teaching to improve the quality of student learning (Mayuri et al., 2021a). One media that can overcome the problem of student learning concentration is the Quizizz application. The Quizizz application is an educational application that applies the concept of gamification (Fadhilawati, 2021). Quizizz has exciting features such as avatars, music, board ratings, and themes that make students study like they are playing games (Namara & Murphy, 2017). Further,

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Zuhriyah & Pratolo (2020) think that the quiz application gives the student an interactive experience and fun to practice, especially for answering the question. After students answer the question, Quizizz automatically presents a theme to inform whether their answer is correct. Research in several countries shows a positive influence of using Quizizz on learning (Suharsono, 2020). A study match was completed by Indrawati et al. (2021) with the title "Usage Quizizz app for Increase Learning Concentration of Students in Physics Subjects in Class XI-IPA 1 Senior High School Negeri 6. Padang." This study uses the application Quizizz to increase concentration and study results. This research focused on giving treatment quizzes with the Quizizz application as an evaluation for Advanced Natural Science learning to improve the learning concentration of students post-pandemic. It is hoped that the treatment of giving quizzes after learning using the Quizizz application in Advanced Natural Science courses can encourage students to return to FTF learning. They can refocus and concentrate on participating in offline/face-to-face learning. Research conducted (Anggraeni & Taufiq, 2021), Quizizz is used in learning evaluation and is given once after learning. The same thing was also done by (Ramadhani & Ardi, 2022), Quizizz was carried out as a form of learning assessment which was only given once after the lesson ended. In this study Quizizz was given seven times at each meeting at the end of which Quiziz was always given. The purpose of giving Quizizz seven times is to find out the impact of giving Quizizz on students' learning concentration from time to time.

METHOD

Research Design

This study uses a quantitative approach with quasi-experimental research methods. Quasi-experimental research is research designed to be more natural, not laboratory manipulative, so that not all variables can be controlled or manipulated (Cohen et al., 2007). This research design used a pretest-posttest group design which uses one research class. First, students are given a pre-test. After being given the pre-test, the students were given treatment, namely using the Quizizz application in learning. After the treatment was given, the post-test was given. Pre-test and Post-test were conducted to determine student learning concentration scores before and after treatment. The research design can be seen in Figure 1.

O_1	X	O_2

Figure 1. One Group Pre-test Post-test Research Design

Description: O_1 is the Pre-test score; X is Treatment with giving quiz through the application Quizizz; and O_2 is = Post-test score

Teacher Intervention

This research was conducted to evaluate Advanced Natura Science learning after the Covid-19 pandemic. This study aims to determine whether giving quizzes with the Quizizz application affects student learning concentration. This study uses two variables: the provision of quizzes with the Quizizz application as the independent variable and student learning concentration as the dependent variable. Giving quizzes with the Quizzizz application here is a treatment given to students in learning. The examination is given to students after the learning material. The hope is that the student's learning concentration increases because they will do quizzes. After doing the quiz, the lecturer, together with the students, discuss the results of the quiz that is done as well as conducts an evaluation.

Sample

The population of this study were EIEST students who took Advanced Natural Science courses for the 2021/2022 academic year, namely 4th-semester EIEST students consisting of classes A and B. The research sample used random cluster sampling. According to Sugiyono (2016), purposive sampling is a technique of taking a sample based on something specific. The example from the study is EIEST Semester 4 Class A, which totaled 36 students.

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Student Demography

The sample of this research is students in the 4th semester of the 2021/2022 academic year who are taking the Advanced Science Natural Course. The age range of students is between 19-21 years. This sample comprised 36 students, consisting of 33 women and three men.

Data Collection Instruments

The instrument used to obtain data on student learning concentration is the observation sheet instrument. This observation sheet consists of ten statements that will be observed. The validation of sheet instruments used in this study was validated by experts consisting of two experts. After the instrument is declared valid, then the instrument is used in the learning process. The observers in this study were lecturer colleagues who advocated learning strategy courses. During the learning process, the observer observed the students' concentration in participating in learning. This observation was carried out in two conditions: before the quiz was given (pre-test), and the observation was made in learning accompanied by an examination (post-test). The grid of the observation sheets used can be seen in Table 1.

Table 1. Guidelines for Student Learning Concentration Observation Sheet

No.	Indicator	Statement	Item
1	Readiness accepting learning	• Students prepare equipment for learning • Students already know the material to be studied	1, 2
2	Attention to material learning	• Students pay attention to the lecturer's explanation and presentations from their friends • Students are not busy themselves with gadgets or chatting with friends	3, 4
3	Active expression of their opinion	• Students ask questions that the lecturer does not understand • Students dare to express their opinions or suggestions to both lecturers and friends, presenting	5, 6
4	Responsive to instructions	• Students take part in lecture activities according to the lecturer's instructions • Students respond quickly when they receive assignments/instructions from the lecturer	7, 8
5	Ability to respond to the material	• Students understand the material presented by the lecturer • Students carry out assignments and evaluations correctly	9, 10

Besides the observation sheet, the researcher also gave a questionnaire to the students to find out their responses to the quiz using the Quizizz application. These student responses can later be used to evaluate Advanced Natural Science learning. The questions asked of students in the questionnaire can be seen in Table 2.

Table 2. Questionnaire Evaluation Advanced Science Learning

No.	Question
1	Is Advanced Natural Science learning interesting?
2	What things need to be addressed in Advanced Natural Science learning?
3	What are the obstacles experienced when learning Advanced Natural Science?
4	What do you think about being given a quiz using the Quizizz application at the end of the lesson?
5	What advice would you like to give for Advanced Natural Science lessons?

After compiling the research instrument, the next researcher tested the validity of the instrument that had been prepared. The validity of the researcher includes content/construct validity. Content validity is carried out by expert judgment lecturers, as many as two experts. Construct validity focuses on the extent to which the instrument can measure the concept of the theory. Both experts were asked to provide input and assess whether the developed instrument was suitable for use in research. Instruments that experts validated were observation sheets of student learning concentration and evaluation questionnaires for Advanced Science learning. The results of the validation show that the instrument can be used for field tests with revisions according to the validator's suggestions. The

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suggestion from the validator is to be asked to add an assessment rubric to the observation sheet. After being revised, the instrument is ready for field tests.

Data analysis was performed using the t-paired test. This analysis was carried out on the students' learning concentration scores before being given a quiz and learning with a quiz. The hypothesis given is as follows.

H_0 = there is no difference in students' learning concentration in learning before and after being given a quiz with Quizizz.

Ha = There are differences in students' concentration in learning before and after being given a quiz with Quizizz.

The t-paired test analysis was carried out with the help of statistical software. The significance used in this data analysis is 5% (0.05) or the 95% confidence level. This is following the rules of research in the field of education. It is said that there is a significant difference in the pre-test and post-test data if the value of sig. 2-tailed < 0.005, or t-count > t table. Before testing the hypothesis with the t-paired test, the prerequisite test of the hypothesis is carried out, namely the normality test. The normality test was conducted to determine whether the distribution of group data was normally distributed or not. The data is said to be normal if the sig value is at a significance level of 5% (0.005). >0.005. If the normality test has been met and the data is said to be normal, it can be continued to test the hypothesis with the t-paired test.

RESULTS AND DISCUSSIONS

This study uses two variables: the independent variable as a treatment is giving quizzes with the Quizizz application, and the dependent variable is the learning concentration of the student. This research was conducted to evaluate Advanced Natural Science learning after the Covid-19 Pandemic. This study aims to determine whether giving quizzes with the Quizizz application affects student learning concentration. Advanced Natural Science Learning at FTF learning after this pandemic has encountered various problems, especially the problem of students' concentration on the material. This can be seen from the results of observations; it can be seen that some students look blank. Some looked sleepy; others seemed to be playing with their cell phones. Less than 50% of students are focused on learning activities. The interviews with several students also showed they felt sleepy and lacked focus during learning. Some others find it difficult to concentrate, are easily distracted by other things, and lack the motivation to study. According to them, the material is quite complex, making it difficult to concentrate on understanding the material. This requires evaluation so that it can improve the less conducive learning conditions.

The existence of a quiz treatment with the Quiziz application is projected to increase student learning concentration. Purba (2019) stated that Quizizz improved student learning concentration in Physics Chemistry I. This study consisted of two learning designs: without Quizziz (as a pre-test) and with Quizzes (as a post-test). Before being used for research, the instruments used in this study were validated by two experts. Based on the expert's suggestions, there were several revisions, namely changing indicator sentences into operational sentences and revising some statements that were not standardized. The research instrument is used after being revised and declared valid by the expert. The following is the implementation of the learning carried out.

Learning Design without Quiz: To Get Preliminary Data on Student Condition

The first learning design is learning that is done before being given treatment with a quiz. This learning activity is divided into opening, core activities (material), and closing. The opening activity contains apperception, motivation, and confirmation of previous tasks. The core activity is delivering material by lecturers, presentations, discussions, or other learning activities. The closing activity is filled with evaluation or providing feedback on the learning that has been done. In this learning process, preliminary observations (pre-test) were carried out on the concentration of student learning.

Concentration data study students obtained from results observed during the learning process take place. The instrument used is sheet observation. The concentration data collection study conducted two words: when learning before the gift quiz (pre-test) and at the moment learning with the gift quiz (post-test). The results of the pre-test can be seen in Table 3.

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Table 3. The Pre-test Data of Student Learning Concentration

	Average Score
The Lowest Score	45.0
The Highest Score	85.0
Mean	67.0
Standard Deviation	11.7

Table 3. shows that the average learning concentration score of 35 students is 67, with the lowest score of 45 and the highest score of 67. These results indicate that the student's learning concentration is still lacking.

Learning Design with Quiz: to Get Post-test Data

The second learning design is learning by being given treatment, namely by providing quizzes with the Quizizz application. This learning activity is divided into three movements: opening, core, and closing. The opening activity contains apperception, confirmation of previous tasks, and motivation. The core activity is the delivery of material by lecturers, student presentations, or other learning activities then, followed by giving quizzes with the Quizizz application. The third activity is the closing which is filled with evaluation or providing feedback on the learning activities that have taken place. This activity also discussed quiz questions that have been done by students so that students have a deeper understanding of the material that has been studied.

The students looked enthusiastic and focused on the learning process when the lecturer said there would be a quiz at the end of the material. The results of the questionnaire given to students on providing quizzes with the quiz application showed a positive response. The following are some of the answers provided by students.

Student 1: *" The quiz makes me more enthusiastic about learning. In addition, it can also measure the level of understanding of the material."*
Student 2: *" The existence of a good quiz because it can review the material studied."*
Student 3: *" The existence of quizzes with Quizizz adds to the enthusiasm because you can see the rankings directly and compete with friends."*
Student 4: *"In my opinion, having a quiz at the end of the lesson is very good because, with it, students can increase their concentration in understanding the lesson."*
Student 5: *"Quizzes will encourage students to understand the material before the quiz starts. This requires me to focus on the material."*

Some of these responses indicate that with the treatment of giving quizzes after the learning material with the Quizizz application, students give positive answers. Their concentration and focus on learning increase. In addition, Quizizz also provides a feature for students to see their grades and rankings in class. This can increase enthusiasm and competition among students (Lestari, 2022). Students still adapting to implementing FTF seem enthusiastic about participating in the learning material. This is because students are motivated by the quiz after learning (Sastranegara, 2017; Rahman et al., 2020).

The existence of a quiz is also able to measure the level of student understanding. They know whether they understand the material being studied or not. Giving this quiz can provide feedback (Riskawati, 2017). This Quizizz Media can also explore the extent of student understanding regarding the learning being carried out (Panggabean & Harahap, 2020). After giving the quiz, the lecturer and the students reviewed the material that had been studied. Quizzes can check the content of learning materials (Sihombing et al., 2021). The material review was conducted to determine which parts of the quiz could not be answered correctly and which parts needed further explanation. This is in line with what was conveyed by Salsabila et al. (2020), who revealed that Quizizz could increase student activity by asking questions related to the material and evaluating it. Thus, students can understand thoroughly what they have learned.

The post-test in this study was to observe the concentration of student learning in a series of learning that included giving quizzes with the Quizizz application. The treatment of giving this quiz is done seven times in one semester. Based on the observations, the post-test results are listed in Figure 2.

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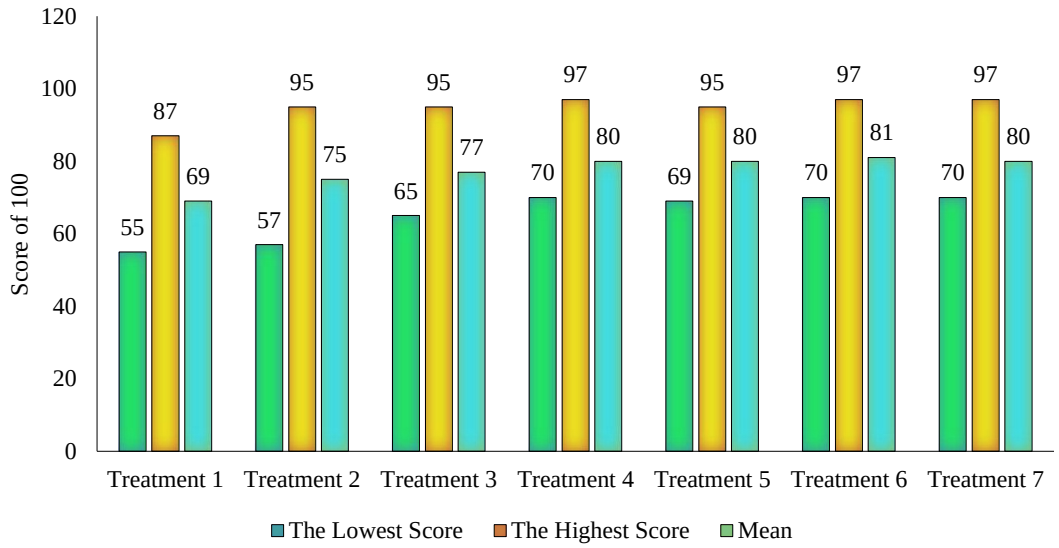

Figure 2. Student Quiz Result Diagram

Based on Figure 2. It can be seen that giving quizzes with Quizizz can increase student learning concentration. In the first treatment, there was an increase but not too big. The increase in learning concentration increased significantly in the second to fourth treatments. After the fourth treatment, it was seen that the concentration of student learning was relatively stable. This shows that the concentration of student learning on learning with Quizizz increases rapidly but does not when Quizizz is given continuously. As stated by Adawiyah (2021), so that students do not get bored, learning methods that are varied and not monotonous are needed.

Table 4. The Average of Student Learning Concentration Post-test Results

	Average Score
The Lowest Score	65
The Highest Score	95
Mean	78
Standard Deviation	7

Table 4. shows that the average learning concentration score of 35 students is 78, with the lowest score of 65 and the highest score of 95. Table 4. shows that the concentration of student learning has increased after the treatment of giving quizzes with the Quizizz application. The complete ratio of the pre-test and post-test student learning concentration can be seen in Figure 3.

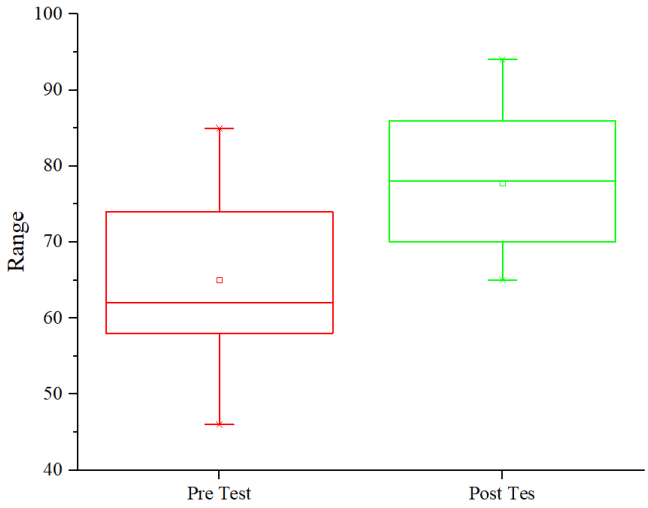

Figure 3. Learning Concentration Score of Student

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Figure 3. It shows that the student's concentration in learning increases with the treatment of giving quizzes using the Quizizz application. Students will pay more attention to the learning material when they know a quiz will be held. Panggabean & Harahap (2020) convey that the quiz encourages students to prepare themselves. In addition, Quizizz provides some exciting features. Students can see the quiz results directly; they can find the wrong items and know the correct answers; they can compete with their classmates because they are ranked in class. Besides that, Purba (2019) also mentioned that student performance results in doing quizzes could be downloaded in Excel. This will be very helpful in evaluating the learning activities that have taken place.

Hypothesis Testing

This study conducted research in one class with a one-group pre-test and post-test design. The research was conducted in two conditions: learning before applying the quiz with the Quiziz application (pre-test) and learning after applying the quiz with Quizizz (post-test). Observation of student learning concentration was carried out during the learning process. Furthermore, a statistical test was conducted using the T-Paired Test to determine whether there is a significant difference in students' learning concentration scores before and after being given treatment with Quizizz. Before testing this hypothesis, a prerequisite hypothesis test is tested, namely the normality test. The normality test was carried out to determine whether the data is normally distributed. Good data is normally distributed. The results of the normality test can be seen in Table 5.

Table 5. Normality Test

Prerequisite Test Hypothesis	Value Significance
Normality Test	0.053

Table 5. The significance value obtained in the normality test is 0.533 or sig.> 0.05. These results indicate that the student learning concentration data is normally distributed. After knowing that the data is normally distributed, then the hypothesis is tested. Data analysis was performed using the t-paired test. This analysis was carried out on the students' learning concentration scores before being given a quiz and learning with a quiz. The hypothesis given is as follows.

H_0 = There is no difference in students' learning concentration in learning before and after being given a quiz with Quizizz

Ha = there are differences in student learning concentration in learning before and after being given a quiz with Quizizz

The results of hypothesis testing can be seen in Table 6.

Table 6. T-Paired Test

Variable	Sig. (2-tailed)
Learning Concentration of Student	0.001

Table 6 shows that the results of hypothesis analysis using the T-Paired Test obtained a significance value of 0.001 or a significant value. (2-tailed) < 0.05. This shows a significant difference in student learning concentration between the pre-test (before treatment) and the post-test (after treatment). The experimental results show that giving treatment with quizzes using the Quizizz application increases students' concentration (Indrawati et al., 2021; Agustia et al., 2021; Zhao, 2019). Furthermore, Zhao (2019) also explained that students liked the device board feature provided by the Quizizz application. With this device board feature, they can find their rankings directly and motivate them to learn.

The findings of this study indicate that Quizizzz can be used to evaluate Advanced Natural Science Courses in post-pandemic PTM. The lack of student concentration in Advanced Science lectures can be overcome by giving quizzes using the Quizizz application. In addition to increasing student learning concentration, it turns out that providing quizzes with the Quizizz application also has several positive impacts. Among these positive impacts are increasing learning motivation (Santosa & Yulianti, 2020), improved spirit competition (Supriadi et al., 2021), and enhanced understanding of the material (Mayuri et al., 2021b).

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Students who can adapt to face-to-face learning must be supported and facilitated as much as possible so they can focus and be comfortable with FTF learning. Class conditions are made as fun and relaxed as possible. This conducive learning will encourage students to be active (Arianti, 2019). Besides that, lecturers can innovate in face-to-face learning that as begun by Zunidar, 2019 so that students are more motivated and focused on participating in education (Pratiwi & Siswanto, 2020). In addition, lecturers can use the media to help students more easily refocus and concentrate on FTF learning (Magdalena et al., 2021). Evaluation of learning needs to be done periodically so lecturers can determine whether education is effective (Munthe, 2015). Lecturers need to evaluate to determine the methods and learning media used. Lecturers and students must work together for the success of learning (Annajmi, 2018).

CONCLUSION

The findings from this study show that Quizizz can be used to evaluate Advanced Natural Science subjects in face-to-face learning after the pandemic. The lack of student concentration in Advanced Natural Science lectures can be overcome by giving quizzes using the Quizizz application. This can be seen from the analysis using the t-paired test, where the significance value is 0.001 or the sig value. (2-tailed) < 0.05. These results indicate a significant difference in student learning concentration between the pre-test and post-tests (before and after treatment). In addition to increasing student learning concentration, it turns out that giving quizzes with the Quizizz application also has several positive impacts. Among the positive impacts are increasing learning motivation, increased spirit of competition, and increased understanding of the material. As a suggestion, future researchers who wish to research related to post-pandemic learning can innovate in learning methods. Quizizz will be more optimal if combined with a learning approach or model, so students do not get bored.

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