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Quizizz Application and Its Impact on Advanced Mathematics Learning Outcomes of Prospective Elementary School Teachers in Indonesia

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ABSTRAK

Adanya Pandemic Covid-19 memberikan pengaruh besar terhadap semua bidang kehidupan terlebih lagi di bidang pendidikan, salah satu dampak dari covid adalah pembelajaran yangsemula dilakukan secara tatap muka berganti menjadi belajar jarak jauh yang berpengaruh buruk terhadap mahasiswa salah satunya yaitu hasil belajar matematika lanjut mahasiswa rendah. Penelitian ini bertujuan untuk menganalisis pengaruh penggunaan media aplikasi Quizizz tehadap hasil belajar matematika lanjut mahasiswa. Jenis penelitiannya adalah Quasi Eksperimen, dengan desain penelitian Pretest Posttest Control Group Design. Populasi dalam penelitian ini yakni 32 orang mahasiswa. Penarikan sampel penelitian dilakukan dengan teknik purposive sampling. Pengumpulan data dalam penelitian dilakukan menggunakan metode tes dan observasi dengan instrument penelitian berupa tes objectif. Data hasil penelitian kemudian dianalisis dengan menggunakan teknik analisis uji deskriptif, uji normalitas, uji homogenitas, uji hipotesis dan uji anova. Hasil penelitian menunjukkan bahwa nilai signifikansi sebesar 0,000 < 0,05 atau lebih kecil dari 0,05. Sehingga dapat disimpulkan bahwa terdapat pengaruh aplikasi media quizizz terhadap kemampuan hasil belajar mahasiswa pada mata kuliah matematika lanjut.

ABSTRACT

The existence of the Covid-19 Pandemic has a major influence on all areas of life, especially in the field of education, one of the impacts of covid is that learning which was originally carried out face-to-face has changed to distance learning which has a negative effect on students, one of which is low student advanced mathematics learning outcomes. . This study aims to analyze the effect of using Quizizz application media on students' advanced mathematics learning outcomes. The type of research is Quasi Experiment, with a research design of Pretest Posttest Control Group Design. The population in this study were 32 students. The sampling of the research was carried out by purposive sampling technique. Data collection in the study was carried out using the test and observation method with the research instrument in the form of an objective test. The research data were then analyzed using descriptive test analysis techniques, normality test, homogeneity test, hypothesis testing and ANOVA test. The results showed that the significance value was 0.000 <0.05 or less than 0.05. So it can be concluded that there is an effect of quizizz media application on the ability of student learning outcomes in advanced mathematics courses.

1. INTRODUCTION

Mathematics is a field of pure science which is the basis for the development of other sciences, so that mathematics is a compulsory subject to be taught to students starting from elementary school level up to the tertiary level (Fadillah & Bilda, 2019; Huzaimah & Risma, 2021). The field of knowledge in mathematics is related to numbers and the process of thinking logically in the process of solving problems (Nur, 2021; Purna & Ardana, 2021). At the university level, mathematics is a science that is given to students as one of the subjects related to reasoning, calculation, numbers, related to the concept of logarithms, flexibility, accuracy, efficiency, and precision in problem solving (Batubara, 2020; Suparni, 2019). Through mathematics courses students will be able to find various concepts that can be useful for everyday life. One of the advanced mathematical materials that must be completed is material on the System of One Variable Linear Equations (SPLSV) (Kristanto et al., 2020). A system of one-variable linear equations is material that presents an open sentence, which is identical to the use of the symbol (=) and has only one variable (Panduwinata et al., 2019; Sonia et al., 2022).

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Material system of linear equations one variable is very suitable to be taught by using the help of word problems related to everyday life. This is because SPLSV material is material that is closely related to daily life, for example determining the amount of money to buy goods and dividing time in a job (Hartati et al., 2019; Sonia et al., 2022). In addition, SPLSV material is also a prerequisite material that has a lot of connection with advanced material such as angles and lines or with a two-variable equation system (Ariansyah et al., 2021; Serina et al., 2022). Material related to everyday life will certainly be able to develop students' thinking processes, so that later students can solve various mathematical problems that arise in everyday life (Indah & Rochaminah, 2021; Puspandari et al., 2019). It's just that the reality on the ground shows that student mathematics learning outcomes in SPLSV material are still relatively low. This is in line with the results of observations and interviews with lecturers in advanced mathematics courses at Ahmad Dahlan University. The results of observations and interviews show that most of the learning outcomes of second semester students of the Elementary School Teacher Education Study Program at Ahmad Dahlan University are still low, this can be proven from the results of assignments, midterm exams that have not reached the achievement standards set by the tertiary institution. The causes of low student learning outcomes in advanced mathematics courses at UAD are students bored with the conventional learning system, watching evaluation systems, lack of motivation and challenges in answering and working on evaluation questions, lack of enthusiasm of students in lectures both asking and answering questions related to material, evaluation tools used is still unattractive and ineffective in the learning process. If allowed to continue, this will have an impact on not achieving learning objectives and low credit scores earned by students.

To overcome these problems, innovative evaluation tools or media are needed that are interesting and effective in the learning process during the Covid-19 period which can generate motivation and improve student learning outcomes. One of the evaluation tools that can be used is the quizizz application. The quizizz application is an interactive evaluation application, an educational application that allows students to actively participate in fun, multiplayer class activities (Azzahra & Pramudiani, 2022; Khasanah & Lestari, 2021). Quizizz application-based media is an e-learning web-based evaluation application that can be accessed free of charge by lecturers and students that are used by lecturers to create online quizzes (Hidayati & Aslam, 2021; Kristanto et al., 2020; Rukiye, 2021). Through the use of the quizizz application students can track or know the progress of their learning process, this is because students can take quizzes repeatedly, and if students take quizzes at the same time in class students can see their ranking on the leaderboard directly (Feladi et al., 2021; Munfarikhatin et al., 2021). In addition, the Quizizz application also presents time limit allocations, points, and social relations which can increase user participation and determination and can provide empowerment in completing assigned tasks (Agustia et al., 2021; Callista et al., 2021). The quizizz application can not only be used as an evaluation medium, but can also be used as a means of entertainment that can train students' thinking processes (Heckie et al., 2022). In making quizzes in the quizizz application, lecturers can prepare quizzes by making their own or choosing quiz features from other quiz libraries made by other educators which can reduce the burden on educators (Mawaddah et al., 2021; Munfarikhatin et al., 2021).

Several previous studies have revealed that the effectiveness of using the quizizz application in school mathematics courses can increase student motivation and learning outcomes (Wijayanti et al., 2021). The results of other studies also revealed that the use of quizizz interactive quizzes as a medium for evaluating online learning in physics-chemistry subject 1 was effective for students (Purba, 2020). Subsequent research revealed similar results, namely that it was said that quizizz could improve students' reading skills (Suwarto, 2021). Based on some of these research results, it can be said that the quizizz application is very suitable for use in the learning process because it can improve student learning outcomes. It's just that in previous studies there were no studies that specifically discussed the application of the quizizz application and its impact on advanced mathematics learning outcomes for prospective elementary school teachers in Indonesia. So this study focused on this study with the aim of analyzing the effect of using the Quizizz application media on students' advanced mathematics learning outcomes.

2. METHOD

This research belongs to the type of quasi-experimental research (quasi-experiment) with a Pretest-Posttest Control Group Design. The population in this study were all second semester students in two classes. Sampling in the study was carried out by using random sampling technique. The samples involved in this study were students in class 2C and 2D, with class 2C as the control class, namely the class taught by conventional learning and class 2D as the experimental class which was taught using the Quizizz learning media. Data collection techniques used the test method, with instruments test in the form of multiple choice pretest and posttest. The implementation of the research begins with giving pretest

questions to control class students. After that, the experimental class applied learning or learning evaluation using the quizizz application media while the control class used conventional methods. The final activity in this study was giving a posttest where the experimental class used the Quizizz application while the control class was given questions using the Google form.

The data obtained in the study were then analyzed using One Way Anova analysis. Before testing the hypothesis, there are several requirements that must be met and need to be proven, including: the data being analyzed must be normally distributed, the data being analyzed is homogeneous. Both of these requirements must be proven first. So from this it is necessary to test the prerequisite analysis by carrying out the normality test and homogeneity test. The normality test uses SPSS version 23 for windows, the Shapiro Wilk statistical test is at a significance of 0.05. While testing the homogeneity of variance in this study was carried out using the Levene's Test of Equality of Error Variance with the help of SPSS version 23 through the Box's M test.

3. RESULT AND DISCUSSION

Result

Descriptive statistical test

Data The results of descriptive statistical analysis regarding the effect of using the quizizz application on student learning outcomes in PGSD advanced mathematics courses can be seen in table 1.

Table 1. Results of Descriptive Statistical Calculations of Student Learning Outcomes

	N	Minimum	Maximum	Mean	Std. Deviation
Pre test Eksperimen	32	60	92	72.00	8.254
Post test Eksperimen	32	72	100	84.25	8.250
Pre test kontrol	32	52	84	66.63	7.975
Post test Kontrol	32	60	96	80.13	7.902
Valid N (listwise)	32				

Based on the data in the table above, it can be seen that the pretest results of PGSD students in the experimental group before the quizizz media application was applied obtained an average score of 72.00 with a minimum score of 60, and a maximum score of 9. Meanwhile, the posttest results of PGSD students in the experimental class after the quizizz application was applied , students get an average score of 84.25 with a minimum score of 72 and a maximum score of 100. Then the pretest results of control class PGSD students get learning outcomes or an average score of 66.63 with a minimum score of 52 and a maximum score of 84 While the posttest score for the control class is to get an average score of 80.13 with a minimum score of 60, and a maximum score of 96. So from these data the Quizizz media application has an influence on student learning outcomes as evidenced by the posttest results data of experimental class students having the average is greater, namely 84.25.

Prerequisite test

Testing the research prerequisites is carried out by carrying out the normality test and homogeneity test. The normality test was carried out to find out the learning outcomes of PGSD students' basic mathematics courses using the Quizizz media application whether the data has normal distribution or vice versa. The results of the data normality test can be seen in table 2.

Table 2. Normality Test Results

Model		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistc	df	Sig.
Hasil belajar Mahasiswa	Pre Test Eksperimen	0.095	32	0.200	0.952	32	0.164
	Post Test Eksperimen	0.134	32	0.151	0.944	32	0.095
	Pre Test Kontrol	0.129	32	0.191	0.971	32	0.514
	Post Test Kontrol	0.131	32	0.173	0.964	32	0.351

Based on table 2, it can be seen that the normality test can be analyzed by comparing the largest (sig) value with the significance level (α = 0.05). If the value (sig)>(α=0.05) is normally distributed data. The results of the normality test in table 2 show that the value (sig) of the experimental class and the value (sig) of the control class have a value of more than 0.0. The results of the two classes show that the

data is normally distributed. After obtaining the results of the normality test, the analysis then proceed to the homogeneity test. The homogeneity test results can be seen in table 3.

Table 3. Data homogeneity test results

	Model	Levene Statistic	df1	df2	Sig.
Hasil Belajar Mahasiswa	Based on Mean	0.542	1	62	0.464
	Based on Median	0.511	1	62	0.477
	Based on Median and with adjusted df	0.511	1	61.127	0.477
	Based on trimmed mean	0.475	1	62	0.493

Based on table 3, it can be seen that the calculations in both classes have a value (sig) of 0.493> 0.05, where the value (sig) is superior to the level of significance (α = 0.05) so that the data is declared homogeneous.

Test the research hypothesis

The next analysis is testing the research hypothesis through the t-test assisted by the Windows SPSS version 23 application. The results of the t-test analysis can be seen in table 4.

Table 4. Results of the t-test or Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre test Eksperimen - Post test Eksperimen	-12.250	12.768	2.257	-16.854	-7.646	-5.427	31	.000
Pair 2	Pre test kontrol - Post test Kontrol	-13.500	11.484	2.030	-17.640	-9.360	-6.650	31	.000

Based on the results of the calculation of the paired sample t-test, there is a requirement when making a decision, that is, if the sig 2-tailed value is smaller than the value α = 0.05 then H0 and H1 are accepted. The paired sample t-test type test serves to test the hypothesis of increasing pretest and posttest scores for the class that was given the Quizizz treatment and the non-treatment class. In addition, the results of the analysis also show that the significance value is smaller than 0.05, namely 0.000 <0.05. So it can be concluded that there is an effect of using the Quizizz media application on the learning outcomes of second semester PGSD students in advanced mathematics courses. This can also be proven by the results of the ANOVA test which also shows that the significance value is 0.000 <0.05 or less than 0.05. So it can be proven that there is an influence of the quizizz media application on the ability of student learning outcomes in advanced mathematics courses. The results of the ANOVA test can be seen in table 5.

Table 5. One Way Anova Results

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6039.000	3	2013.000	30.706	0.000
Within Groups	8129.000	124	65.556		
Total	14168.000	127			

Discussion

The results of the research analysis show that the quizizz application is very suitable for use in the learning process, this is because the quizizz application can attract students' attention in the learning process with its attractive characteristics and easy to use (Rizki & Kurniawati, 2022; Sales, 2020). Based on these results it can be said that an increase in student learning outcomes in mathematics courses can be achieved because this quizizz media application has various features that help students and lecturers such as fun features such as: leaderboards, material via video, images, audio and others (Feladi et al.,

2021; Kristriani & Usodo, 2022; Munfarikhatin et al., 2021). There is an increase in learning outcomes because in the quizizz application students can see firsthand the ranking or grades they get, so students can find out where their strengths and weaknesses are in the process of understanding teaching material (Agustia et al., 2021; Callista et al., 2021; Kristriani & Usodo, 2022). The quizizz application has various advantages such as web-based e-learning which can be accessed free of charge by anyone anywhere and anytime, students can see their ranking on the leaderboard directly, the quizizz application presents time allocation points, and social relations that can increase user participation and determination and can provide empowerment in completing the assignments given, the quizizz application can also help strengthen students' memories of the material being taught (Hamidah & Wulandari, 2021; Kristanto et al., 2020; Matlan & Maat, 2021; Sales, 2020).

The quizizz application which can be accessed anywhere and anytime is of course very helpful for the online learning process during a pandemic. Improving the quality of education during the pandemic was carried out by increasing students' technological mastery abilities, especially students of the Elementary School Teacher Education study program. In order to get a better quality of education, it is necessary to increase student achievement. Improving learning achievement in a better direction is the target and goal of all institutions from elementary to tertiary institutions. The existence of an increase in learning achievement can be seen from the achievement of student learning outcomes. Student learning outcomes are one aspect that is used as a measure of success in the world of education and learning (Kaso et al., 2021). Learning outcomes will be good if supported by maximum learning activities. This then reiterates that learning has an important role in improving student abilities, where the learning process accompanied by the use of technology can increase student interest, focus, stimulate metacognitive, and be active (Hamilton et al., 2021; Kawuri et al., 2019; Munawir & Hasbi, 2021; Razali et al., 2020).

The results obtained in this study are in line with the results of previous research which also revealed that the effectiveness of using the quizizz application in school mathematics courses can increase student motivation and learning outcomes (Wijayanti et al., 2021). The results of other studies also revealed that the use of quizizz interactive quizzes as a medium for evaluating online learning in physics-chemistry subject 1 was effective for students (Purba, 2020). Subsequent research revealed similar results, namely that it was said that quizizz could improve students' reading skills (Suwarto, 2021). Based on some of the results of these studies, it can be said that the quizizz application is very suitable for use in the learning process because it can improve student learning outcomes.

4. CONCLUSION

Based on the results of data analysis, it can be seen that the significance value is superior to the level of significance. So it can be concluded that there is a positive influence on the use of the quizizz application on student learning outcomes in advanced mathematics courses.

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