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THE EFFECTIVENESS OF THE USE OF QUIZIZZ-BASED GAMIFICATION ON STUDENTS' LEARNING INTEREST IN 4TH GRADE MATHEMATICS

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Abstract

The learning interest of 4th grade students at SD Muhammadiyah 16 Palembang in mathematics is still low due to online learning media factors that are less attractive and conventional learning (questions and answers, and assignments). This research aims to determine students' learning interest before and after using Quizizz-based gamification and to determine the effectiveness of using Quizizz-based gamification on students' interest in 4th-grade mathematics learning. This research uses experimental quantitative methods. The population in this research was all 4th grade students as the experimental and the control class. The results of the research using the t-test and the N-Gain test showed that t_{table} 2,000 and t_{count} 6.104 from the results of the independent sample t-test on students' interest in learning is $t_{count} > t_{table}$. So H_a is accepted and H_o is rejected. While the N-Gain test in the experimental class is 0.77 and the control class is 0.50. It can be concluded that the use of Quizizz-based gamification is effective on students' interest in mathematics learning in the 4th grade of SD Muhammadiyah 16 Palembang.

Keywords: Quizizz Gamification; Learning Interest

A. Introduction

Mathematics has a very important role in supporting the progress of science and technology. Mathematics is the right tool for problem solving in science (Rahayu & Hidayati 2018). But the fact is that mathematics sometimes becomes a subject that is considered difficult and unpleasant by students because there are still many students who have difficulties in working on math problems.

This is in accordance to Fauzi, et al (2020) with the results of his research argues that the difficulty of mathematics learning causes students' interest in learning to decrease and causes them to be lazy to understand any given material to support the learning process. Interest in learning is one of the aspects that encourage students to learn which is based on interest or happiness and the desire of students to learn (Ricardo, 2017).

Based on information obtained from interviews with 4th grade teachers at SD Muhammadiyah 16 Palembang, there are several problems that arise in the implementation of online learning today, especially in mathematics where students' learning interest is still low and the majority of students are lacking to have high interest in learning these subjects. There are several indicators of lack of interest in learning that can be seen from the online learning process: (1) During the online learning activities students are frequently silent when listening to lectures/explanations from the teacher via Zoom and it was found that from the total of 63 students in 4th grade SD Muhammadiyah 16 Palembang only 35% of students who are active in online learning activities while 65% of students who are not active, (2) Students are less determined in doing the assignments given by the teacher.

There are several factors that cause students' lack of interest in mathematics learning, one of which is online learning media which is less attractive during the learning process. This causes a lack of confidence and competitiveness of students in learning activities and makes students' interest in mathematics learning still quite low. Teachers still use conventional methods, namely

lectures, questions and answers, and assignments. Therefore, we need an activity that can attract students' interest in mathematics learning, especially in online learning activities like today.

Media can increase students' motivation and interest, media can also help students to generate understanding, present interesting data, be reliable, facilitate data interpretation, and compress information (Sukmana, dkk, 2017). In this millennial century, the millennial generation has a very different character from the previous generation. One example is the habit of students in using smartphones. Therefore, it is necessary to optimize the use of smartphones as the learning media (Takdir, 2017).

Based on the explanation above, one of the learning concepts that can be applied during the current pandemic that is creative and innovative is gamification. According to Sari & Hartanto (2015) "gamification is a learning concept that aims to make a game in a non-game context more interesting by combining game thinking and game mechanics". This concept is used to create a sense of fun, confidence, and competitiveness in learning activities by optimizing the use of smartphones as the learning media by using the concept of Quizz-based gamification. According to Mulyati (2020) "Webtool Quizizz is a game-based online learning media that supports multi-game activities into room discussions and can make the classroom atmosphere interactive and happy education".

Several previous studies have stated that learning through Quizizz-based gamification is effective on students' learning interests. According to research by Darimi (2018) states that "the use of Quizizz learning media can develop a hobby in student learning which can be seen based on students' interest in using the team quiz method". While research by Permata (2020) states that "gamification-based mathematics learning design can increase students' interest in learning".

B. Research Methodology

The research method is a scientific way to obtain data with a specific purpose and use. This research is a quantitative research using a quasi-experimental design. The research design used is the Nonequivalent control group design, but in this design, the experimental group and control group are not chosen randomly (Sugiyono, 2018: 2 and 77).

The population of this research is all 4th grade students of SD Muhammadiyah 16 Palembang, which has 54 students. The sample used was 54 students divided into the experimental class 27 students and the control class 27 students using a saturated sample. A saturated sample means the sampling technique if all members are used as the samples.

The treatment design in this research was conducted 6 times. At the first meeting, the student's learning interest questionnaire was distributed before the treatment, then 4 meetings were held in the experimental class using Quizizz-based gamification and the control class using conventional learning, while at the last meeting the student's learning interest questionnaire was distributed after the treatment.

According to Sugiyono (2018:142) "The data collection techniques used in this research are questionnaires, observation, and documentation. The questionnaire is a technique of gathering facts which are done by receiving a set of questions or written statements to the response to be answered".

The researcher uses a closed questionnaire where the resource person only determines the answers that have been provided in the form of a checklist, the measurement scale that will be used in this research is the Likert scale. The Likert scale is used to measure the attitudes, opinions, and perceptions of a person or group of people about certain phenomena.

Observation is a data collection technique that has specific characteristics compared to the other techniques, namely interviews and questionnaires (Sugiyono 2018:145). The observation sheet on the use of quizizz-based gamification is used to observe and record the implementation of the use of quizizz during the online learning. This

instrument is used to observe all student learning activities.

Meanwhile, according to Sugiyono (2018) states that documentation is a method used to obtain data and information directly from the research site, including relevant books, regulations, activity reports, photographs, documentary films, and the data that is relevant to the research.

The data analysis technique in this research used the prerequisite analysis test, namely normality and homogeneity tests to determine whether the data were normally distributed and homogeneous or not. This followed by testing the t-test hypothesis and finding out the effectiveness using the N-Gain test.

C. Result and Discussion

The purpose of this research was to determine before and after the use of Quzizz-based gamification and the effectiveness of the use of Quizizz-based gamification to students' learning interest in the field of mathematics in 4^{th} grade elementary school in the 2020/2021 academic year.

The implementation of the students' learning interest questionnaires distribution before treatment in the experimental class and control class consists of 4 indicators of students' interest in learning, namely: (1) Feelings of pleasure, (2) Students involvement, (3) Interest, and (4) Students attention. Respondents from this questionnaire were 27 students of the 4A class and 27 students of the 4B class. The distribution of the questionnaire was conducted in all classes, the experimental class and control class using google form.

Based on the results of the questionnaire data before the treatment, it was obtained that the experimental class had the highest score of 48, the lowest score of 35, and the average score is 41.15, while the results of the control class data obtained the highest score of 45, the lowest score of 28, and the average score is 37.78.

After knowing the results of the questionnaire data before treatment, then finding out the results of the

questionnaire distribution data after the treatment of the experimental class and control class with the results of the experimental class data obtained the highest score of 100, the lowest score 68, and the average is 86.89, while the control class obtained the highest score of 85, the lowest score of 50 and the average of 68.96.

During the learning process, the researcher made observations assisted by the teacher as an observer on students' learning activities during the learning process using Quizzz-based gamification. This is done to complete the data that will support the students' learning quality during the learning process. Based on the average results of the observation sheet from the experimental class showed results 80 in the very good category, while the control class showed results 49.4 in the fairly good category.

After the research data has been described, the next step is to analyze the data according to the problem formulation and provisional assumptions or hypotheses. Prerequisite testing is needed before analyzing the data, the normality and homogeneity test. If the normality and homogeneity test criteria can be fulfilled, then the T-test and N-Gain test can then be tested.

Hypothesis testing was conducted using the Independent Sample T-Test technique. In addition, the questionnaire data on students' learning interests in the experimental class and control class were processed using SPSS 17.0 for windows. With hypothesis testing criteria if $T_{count} < T_{table}$ then H_o is accepted and H_a is rejected, whereas if $T_{count} \geq T_{table}$ then H_a is accepted H_o is rejected with the level of sig. 0.05.

Based on the hypothesis test calculation that has been done with the help of the SPSS 17.0 program for windows, the results are in table 1 as follows.

Table 1
T-test Results of The Experimental dan Control Class

α	Class	N	Average	T	Sig.(2 tailed)	Sig.
0,05	Experimental	27	86,89	6,104	0,000	0,828
	Control	27	68,96	6,104	0,000	0,828

Observing the results of the T-test, it was found that the t_{count} value of 6.104 was sourced from the t distribution table, the t_{table} value was 2,000 with a significant value of 0.000 which was smaller than 0.05, with the value of $T_{count} \geq T_{table}$. So, according to the basis for collecting decisions in the independent sample T-test can be determined that H_a is accepted and H_o is rejected, which means that the use of Quizizz-based Gamification is effective to students' learning interest in mathematics learning in 4^{th} grade SD Muhammadiyah 16 Palembang.

The N-Gain test is the difference in scores before and after treatment to show the effectiveness of using Quizizz-based gamification to students' learning interest in mathematics learning in 4^{th} grade elementary school. Then the scores of students' learning interest questionnaire before and after treatment were obtained from the scoring results.

The results of the N-Gain test calculation with the help of the SPSS 17.0 program for windows on the value of the students' learning interest questionnaire before and after treatment in the experimental class and control class. The N-Gain Score Test Table is summarized in table 2 below.

Table 2
Recapitulation of N-Gain Test Results For Experimental and Control Class

	Experimental			Control		
	Before	After	N-Gain	Before	After	N-Gain
Total	1111	2346	20,93	1020	1862	13,63
Mean	41,15	86,89	0,77	37,78	68,96	0,50

Based on the data above, it can be analyzed that the difference in scores before and after will produces the N-Gain value. For the experimental class, the average score before treatment is 41.15 and the

average score after treatment is 86.89 with the acquisition of an N-Gain value of 0.77, and based on the interpretation of the N-Gain test included in the high category. Then for the control class, the average score before treatment was 37.78, and the average after treatment was 68.96 with the N-Gain acquisition of 0.50, based on the interpretation of the N-Gain test included in the medium category. It can be concluded that the experimental class experienced the effectiveness of learning interest compared to the control class. So the use of Quizizz-based gamification is effective on students' interest in the field of mathematics in 4th grade elementary school.

Moreover, from the results of the T-test and N-gain test above, it is known that mathematics learning using Quizzz-based gamification is effective on students' interest in learning. This is also supported by the achievement of scores for each indicator of students' learning interests. The following are the results of the achievement of the students' learning interest indicators in the experimental class and control class in table 3.

Table 3
The Result of Acquisition of Students' Learning Interest Indicators

No	Indicator	Experimental Group	Control Group
		Acquisition	Acquisition
1	Feeling of Pleasure	86,81%	71,70%
2	Students Involvement	86,07%	69,33%
3	Interest	87,55%	67,70%
4	Attention	87,11%	67,11%
Total		86,88%	68,96%

Students' learning interest is also seen from the achievement of scores for each indicator of students' learning interest, including:

a) Feeling of Pleasure

Based on the results of the students' learning interest with the feeling of pleasure indicator, the experimental class obtained 86.81% while the control class had obtained 71.70%. This is the same as the research that has been done by Nurhayati (2020) entitled Analysis of interest in Learning Elementary School Prime Numbers Assisted by

Visual Basic Application, based on the results of her research that the results of students' interest in learning with the feeling of pleasure indicators are 87.02%, students become more enthusiastic in participating the learning after using Visual Basic Applications on interest in learning.

b) Students Involvement

The results of the students' learning interest questionnaire with indicators of student involvement, the experimental class has reached 86.07%, while the control class only reached 69.33%. This is in line with the results of research conducted by Nurhayati (2020) that the results of the students' learning interest questionnaire, the indicator of student involvement is 73.08%, which means that learning activities using learning media in mathematics can increase students' interest in learning.

c) Interest

The results of the students' learning interest questionnaire with the indicator of student interest in the experimental class obtained 87.55%, while the control class was 67.70%. Research conducted by Nurhayati (2020) based on the results of her research, the results of the student's learning interest questionnaire on the indicator of interest is 89.18%, which means that it makes students more active and facilitates student and teacher interaction in the use of learning media. So students' self-confidence arises in their goals and answers the math problems they get.

d) Students' Attention

Seeing at the results of the students' learning interest questionnaire with indicators of student attention, the experimental class has achieved 87.11% and the control class 67.11%. This is in line with the research that has been done by Adnyana (2013), obtaining almost the same research results, namely, the results of the students' learning interest questionnaire with the attention indicator are 81.31%.

Based on the results of data analysis and research implementation, the use of Quizizz-based gamification is effectively related to students' learning interest in the field of mathematics in 4th grade elementary school.

The results of this research are also in line with research conducted by Azizah, B (2020) entitled "The Effect of Quizizz Media on Students' Interest in Learning in Akhlak Akidah Subjects in 12th grade of MAN 1 Gresik" based on the results of the research, the Quizizz media has a positive and significant effect on the relationship of students' learning attention, so it can be understood that the more effective the Quizizz media, the higher the students' learning attention. Based on research that has also been done by Takdir, M (2017) entitled "The Application of Gamification Concepts in Mathematics Learning Increases Students' Mathematics Learning Motivation" this is in line with the results of his research in applying the concept of gamification in teaching and learning activities, students will act as players and also the student response is really enthusiastic about students applying gamification in learning mathematics.

The results of research by Yulistiarawati, Umayaroh and Linguistika (2021) which shows that students' interest in learning using the Quizizz learning application is 83% included in the high category. There was a 20% increase in learning interest, so it can be concluded that Quizizz learning can be an alternative for teachers in using learning media during online learning in a pandemic to increase students' interest in learning.

Meanwhile, the results of research by Husna (2021) states that "there is a result of the use of the Quizizz learning media on the learning attention of 11th grade students in the field of economic studies at SMK Negeri 3 Pekanbaru. This is based on the T-test that there is a significant effect on the use of Quizizz learning media on students' learning attention". While the results of Wiratama's research (2015) shows that applying the concept of gamification learning can increase students' interest and participation in

learning geography with a comparison between pre-cycle, cycle I, and cycle II which the percentage is always increasing.

Based on the results of previous research which states that the use of explanation evaluation media on students' learning interest in mathematics learning subjects. Besides the very attractive appearance of the Quizizz media, this media also makes students feel challenged to compete with their friends to get the best score so students are more enthusiastic in mathematics learning. The learning process is said to be effective if all students can be actively involved, both mentally, physically, and socially (Maryani & Suparno, 2018).

D. Conclusion

Based on the results of research that was conducted using the T-test and N-Gain test Based on the results of research that was conducted using the T-test and N-Gain test, there is a big difference to the average results of the questionnaire before treatment in the experimental class of 41.15 and after treatment of 86.89 while students' learning interest before treatment in the control class is 37.78 and after treatment 68.96.

Based on the hypothesis test of the questionnaire data using the T-test after treatment, the results obtained $t_{count} = 6.104$ $t_{table}=2.000$ so that $t_{count} > t_{table}$ then H_a is accepted and to determine the effectiveness of the use of Quizzz-based gamification can be seen through the results of the N-Gain test analysis of students' learning interest questionnaires before and after the experimental class obtained results of 0.77 while the control class obtained results of 0.50. So the use of Quizizz-based Gamification is effective on students' interest in learning in the field of mathematics in 4^{th} grade SD Muhammadiyah 16 Palembang.

Based on the research that has been conducted for the sake of effective and enjoyable learning in order to improve the quality of education. Therefore the need for support from principals, teachers, and the role of parents in increasing the use of learning media, especially

during online or face-to-face learning that optimizes technology, one of which is Quizizz-based Gamification learning evaluation media in order to increase students' interest in learning, especially in mathematics subjects, which is considered boring and difficult for students and can also be developed by subsequent research.

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