

Influence of Quizizz Application As Quantum Learning Model Toward the Concept of Understanding Mathematics Ability

Hilma Arini Millati^{1✉}

¹*Tadris Matematika, Universitas Islam Negeri Prof. K.H. Saifuddin Zuhri Purwokerto, Purwokerto, Indonesia*

✉ email: 1917407081@mhs.uinsaizu.ac.id

Received June 11, 2023

Accepted June 28, 2023

Published July 5, 2023

Abstract: One of the external factors that influenced the concept of understanding ability is the learning style used in classroom activities. The aim of this research is to investigate whether *Quizizz* application as the *Quantum learning* model influence or not the concept of understanding ability at grade XI Senior High School NU 1 Kemranjen. The purpose of this study is to find out whether there is any influence and the implementation on the application of the Quantum Learning model assisted by the Quiz application on the ability to understand the concept of class XI SMA Ma'arif Nu 1 Kemranjen. This research used an Experiment as a method and a quantitative approach. The population of this research is all students of grade XI senior high school which consist of 166 students. The class XI IPA consists of 27 students as the control class and XI IPA 2 consists of 28 as the experiment class. The result showed that there was influence and implementation using the *Quizizz* application as the Quantum Learning model. Meanwhile, the instrument of post-test in the control class and experiment class which used an independent sample test achieved $\text{sig} = 0,000 < \alpha = 0,05$ that revealed different average significance, as a result, there is a significant influence using the *Quizizz* application as Quantum Learning model in the concept of understanding ability of grade XI senior high school NU Kemranjen.

Keywords: *Learning style; Quizizz; Quantum learning*

A. Introduction

Education is an effort for every human being to develop his potential through the learning process. Mathematics is a science knowledge acquired by reasoning. These problems can be solved with various mathematical concepts themselves. Mathematics is also called a structured and organized science, because mathematics starts from elements that are not defined, then elements that are defined by axioms and finally at theorems with various concepts. It is from here that students will gain experience that can improve their understanding of mathematical concepts by applying them. However, there are many students who think that learning mathematics is a complicated and very boring lesson because there is a lack of understanding of the mathematical concepts obtained. This is because there are many formulas that must be memorized and understood. So that the assumption appears that learning mathematics is learning that is difficult, complicated and terrible.

Comprehension is an ability to understand the meaning or concept of a known fact, so as to be able to make a picture, model, give some examples, to explain and re-describe more broadly. A concept is an image or design drawn in the mind. While mathematics is a scientific discipline that has rules and is organized, where there are low concepts to high concepts that

are arranged systematically and hierarchically. Conceptual understanding is a key aspect of learning, besides that the ability to understand mathematics is very supportive of the development of other mathematical abilities. Comprehension is an ability to understand the meaning or concept of a known fact, so as to be able to make a picture, model, give some examples, to explain and re-describe more broadly. A concept is an image or design drawn in the mind.

One of the problems in the process of learning mathematics is the low ability of students to understand the concept of learning mathematics. From the results of the Program survey for International Student Assessment (PISA) 2018 places Indonesia in 74th place (sixth from the bottom). Indonesian students' mathematical abilities got 379 in 73rd position. Observing the problem of students' low ability to understand the concept of learning mathematics, ideas are needed in choosing the right learning model as an innovation in building students' conceptual understanding abilities. The right learning model will create a fun learning atmosphere for students in capturing lessons. Optimal learning and able to achieve the goals of learning.

Based on the results of observations made by means of non-formal interviews with mathematics teachers at SMA Ma'arif NU 1 Kemranjen, it is said that many students are less active during learning, many students cannot re-express a concept, many students find it difficult to classify objects based on their nature according to the concept and many students have not been able to relate a concept to real life. Therefore, it can be concluded that the ability to understand the concepts of class XI SMA Ma'arif Nu 1 Kemranjen is still low. In addition, the learning model used is less attractive or lacks a good response from students so that students' focus on learning is reduced. The learning model used in SMA Ma'arif Nu 1 Kemranjen is a conventional learning model that only uses methods such as lectures and taking notes on the material that has been delivered. Because the teacher often repeats the material presented, in the end the teacher experiences a lack of time in delivering the material.

Based on the problems above, it is necessary to have ideas regarding how to improve students' understanding of mathematical concepts. One of the right ways to overcome this is by implementing a new learning model. The learning model that can be applied to PTM (face-to-face meetings) to overcome students' lack of ability to understand concepts is the Quantum Learning model assisted by the Quizizz application.

The Quantum Learning learning model is tips, instructions, strategies and the entire learning process that can sharpen understanding of memory, and make learning a fun and rewarding process. This learning model is a learning that makes learning comfortable so as to create harmony between students and teachers. In addition, the Quantum Learning learning model has the advantage of being able to increase academic potential (learning achievement) and increase the creative potential that exists within students. While the use of the Quizizz application as a complement to the Quantum Learning learning process is used as a tool that aims to help improve students' understanding of concepts.

The purpose of this study is to find out whether there is an implementation of the Quantum Learning model assisted by the Quizizz application and whether there is an influence of the Quantum Learning model assisted by the Quizizz application on the concept of understanding mathematics in SMA Ma'arif Nu 1 Kemranjen.

B. Methods

Before the test is carried out, there is a validation questionnaire which includes material, language and construction. This validation aims to determine the feasibility level of the instrument used. There are four scores used, namely as follows:

Average score	Description implementation
$3,25 \leq x \leq 4,00$	Very good
$2,50 \leq x < 3,25$	Good
$1,75 \leq x < 2,50$	Good Enough
$1,00 \leq x < 1,75$	Not god

The feasibility of the concept understanding instrument used in this study is based on an analysis that has been validated by the validator.

C. Results and Discussion

The following is an explanation of the results of this study:

1. The results of the analysis of the implementation of the quantum learning learning model assisted by the Quizizz application

Table 2. The analysis of the implementation of the quantum learning learning model assisted by the Quizizz application

Research Partition	Sample Location	Jumlah
1. Nur Halifah	Tuesday, May 6 2023	21,5
2. Khilmatul Fuadiyah	Tuesday, May 6 2023	21,15
Average		3,3

Based on the table above, the results of observations made by observer 1 Nur Halifah were 21.5 while for observer 2, namely Khilmatul Fuadiyah, it was 21.15. Based on the table of the researcher's ability criteria, an average value of 3.3 was obtained which was at an interval of $3.25 \leq x \leq 4.00$, which means that the criteria were well implemented.

2. The application of the analysis of the implementation of the quantum learning learning model assisted by the Quizizz application

Following are the results of data analysis:

a. Experimental Class and Control Class Pretest data

The following are the results of the control class pretest and the experimental class

Table 3. Posttest value DataFor Experiment Class and Control Class

Numb	Name	Pretest	Name	Pretest
1	A.1	25	B.1	3
2	A.2	3	B.2	28
3	A.3	18	B.3	11
4	A.4	28	B.4	14
5	A.5	14	B.5	14
6	A.6	21	B.6	25
7	A.7	14	B.7	21

8	A.8	18	B.8	21
9	A.9	14	B.9	25
10	A.10	11	B.10	32
11	A.11	11	B.11	28
12	A.12	7	B.12	18
13	A.13	21	B.13	25
14	A.14	11	B.14	25
15	A.15	3	B.15	18
16	A.16	25	B.16	7
17	A.17	7	B.17	14
18	A.18	14	B.18	11
19	A.19	7	B.19	14
20	A.20	21	B.20	21
21	A.21	25	B.21	11
22	A.22	28	B.22	18
23	A.23	32	B.23	3
24	A.24	3	B.24	18
25	A.25	18	B.25	3
26	A.26	3	B.26	7
27	A.27	21	B.27	7
28	A.28	18		

The normality test is a prerequisite test regarding the feasibility of data to be analyzed using parametric statistics. This normality test aims to determine whether or not the distribution of pretest results data is normal or not. The results of data analysis using SPSS Version 25 software. The normality test used in this study is the Kolmogorof Smirnov test. Application of the Kolmogorof Smirnov test if the significance (p-value) < $\alpha = 0.05$ means that the data is not normally distributed. If the significance (p-value) $\geq \alpha = 0.05$, it means that the data is normally distributed. The normality test results are as follows:

Tabel 4. Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Hasil Belajar	,102	55	,200	,951	55	,026

After the two class data are normally distributed with a value sig.= 0,176 > $\alpha = 0,05$, then the homogeneity value is sought. Homogeneity test was carried out to find out whether the variance of the data from the samples analyzed was homogeneous or not. In this study, the homogeneity test used the Levene test. The results of data analysis using SPSS software Version 25. With the criteria if significant (p-value) < $\alpha = 0,05$ means the data is not homogeneous and vice versa if (p-value) $\geq \alpha = 0,05$ means the data is homogeneous. The following is the result of homogeneity:

Tabel 5. Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Hasil Belajar	Based on Mean	,005	1	53	,942
	Based on Median	,014	1	53	,906
	Based on Median and with adjusted df	,014	1	52,723	,906
	Based on trimmed mean	,005	1	53	,944

The T test is carried out after it is known that the data taken is normally distributed. The t-test aims to determine the effect of the Quantum Learning model assisted by the Quizizz application on students' understanding of concepts by comparing the average results of the experimental class with the control class. Then to test the hypotheses in this study using an independent sample t test using SPSS Version 25 software. The following is the result of the -t test:

Tabel 6. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Hasil Belajar	Equal variances assumed	,005	,942	,275	53	,784	,620	2,256	-3,904	5,145
	Equal variances not assumed			,275	52,967	,784	,620	2,255	-3,904	5,144

The decision criterion H_0 is accepted if the sig. $\geq \alpha = 0,05$ and H_1 is accepted if the sig. $< \alpha = 0.05$. Based on the results of the independent sample t test using SPSS Version 25 software, it can be seen that the two variances are homogeneous with sig = 0.914 $> \alpha = 0.05$, so the sig value –t test refers to assumed equal variances. So it is obtained that the significance value is sig = 0.850 $> \alpha = 0.05$. From the predetermined decision criteria, H_0 is accepted, so there is no average difference in the pretest results. This means that the initial understanding of the concept of the control and experimental classes is the same.

b. Experimental Class and Control Class Posttest data

The following are the results of the control class posttest and the experimental class:

Table 7. Posttest value DataFor Experiment Class and Control Class

Numb.	Name	Posttest	Name	Posttest
1	A.1	64	B.1	96
2	A.2	96	B.2	82
3	A.3	64	B.3	100
4	A.4	67	B.4	100
5	A.5	82	B.5	100
6	A.6	86	B.6	93
7	A.7	86	B.7	86
8	A.8	75	B.8	93
9	A.9	89	B.9	96
10	A.10	78	B.10	78
11	A.11	78	B.11	86
12	A.12	67	B.12	89
13	A.13	89	B.13	93
14	A.14	96	B.14	89
15	A.15	71	B.15	96
16	A.16	82	B.16	100
17	A.17	71	B.17	89
18	A.18	82	B.18	82

19	A.19	71	B.19	75
20	A.20	57	B.20	93
21	A.21	82	B.21	75
22	A.22	93	B.22	75
23	A.23	100	B.23	93
24	A.24	64	B.24	89
25	A.25	57	B.25	100
26	A.26	53	B.26	86
27	A.27	75	B.27	78
28	A.28	75		

The normality test is a prerequisite test regarding the feasibility of data to be analyzed using parametric statistics. This normality test aims to determine whether or not the distribution of pretest results data is normal or not. The results of data analysis using SPSS Version 25 software. The normality test used in this study is the Kolmogorof Smirnov test. Application of the Kolmogorof Smirnov test if the significance (p-value) $< \alpha = 0,05$ means that the data is not normally distributed. If the significance (p-value) $\geq \alpha = 0,05$, it means that the data is normally distributed. The normality test results are as follows:

Tabel 8. Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Hasil Belajar	,107	55	,176	,950	55	,022

After the two class data are normally distributed with a value sig. = $0,176 > \alpha = 0,05$ and the value is sig. the experimental class is sig = $0,108 > \alpha = 0,05$, then the homogeneity value is sought. Homogeneity test was carried out to find out whether the variance of the data from the samples analyzed was homogeneous or not. In this study, the homogeneity test used the Levene test. The results of data analysis using SPSS software Version 25. With the criteria if significant (p-value) $< \alpha = 0,05$ means the data is not homogeneous and vice versa if (p-value) $\geq \alpha = 0,05$ means the data is homogeneous. The following is the result of homogeneity:

Tabel 9. Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Hasil Belajar	Based on Mean	4,844	1	53	,032
	Based on Median	4,853	1	53	,032
	Based on Median and with adjusted df	4,853	1	46,022	,033
	Based on trimmed mean	4,828	1	53	,032

The T test is carried out after it is known that the data taken is normally distributed. The t-test aims to determine the effect of the Quantum Learning model assisted by the Quizizz application on students' understanding of concepts by comparing the average results of the experimental class with the control class. Then to test the hypotheses in this study using an independent sample t test using SPSS Version 25 software. The following is is the result of the -t test:

Tabel.10 Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Hasil Belajar	Equal variances assumed	4,844	,032	4,356	53	,000	12,548	2,881	6,770	18,325
	Equal variances not assumed			4,388	46,930	,000	12,548	2,860	6,795	18,301

The decision criterion H_0 is accepted if the $\text{sig.} \geq \alpha = 0,05$ and H_1 is accepted if the $\text{sig.} < \alpha = 0,05$. Because the variance is homogeneous with a value of $\text{sig} = 0,032 < \alpha = 0,05$, the sig value of the $-t$ test refers to equal variances not assumed. From the table it can be seen that the value of $\text{sig.} = 0,000 < \alpha = 0.05$, means that H_1 is accepted and means $\mu_1 \neq \mu_2$. Because the initial abilities of the two classes are the same and the final abilities are different, it can be concluded that there is an influence of the Quantum Learning model assisted by the Quizizz Application on the students' understanding of SMA Ma'arif Nu 1 Kemranjen.

D. Conclusion

Based on the results of the research, it is known that there is an implementation of the Quantum Learning model assisted by the Quizizz application on the conceptual abilities of Ma'arif Nu 1 Kemranjen High School students. It can be seen that the average result of the two observers is 3.3. So that at vulnerable $3.25 \leq x \leq 4$ it can be concluded that there is a very good implementation.

Furthermore, it is known that learning with the Quantum Learning model assisted by the Quizizz application is able to influence the ability to understand the concepts of Ma'arif Nu 1 Kemranjen High School students. This can be seen from the results of the Independent Sample T-Test with a value of $\text{sig} = 0.000 < \alpha = 0.05$, means that H_1 is accepted and means $\mu_1 \neq \mu_2$. Because the initial abilities of the two classes are the same and the final abilities are different, it can be concluded that there is an influence of the Quantum Learning model assisted by the Quizizz Application on the students' understanding of SMA Ma'arif Nu 1 Kemranjen.

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