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COMPARISON OF GIVING QUESTION AND GETTING ANSWER STRATEGY AND MULTILEVEL STRATEGY TOWARD STUDENTS' UNDERSTANDING OF MATHEMATICAL CONCEPTS

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ABSTRACT

This study aims to determine the effect of the giving question and getting answer strategy and the multilevel strategy on students' understanding of mathematical concepts. This research is a type of quasi-experimental research with a non-equivalent control group design involving students of class VII B and class VII C of MTsN 5 Bulukumba. The instrument used in this study was a test of understanding mathematical concepts through essay questions. The analysis technique used is descriptive statistical analysis and inferential statistical analysis. Based on the results of data analysis using descriptive statistics in the experimental class, the pretest mean value was 49.21, and the post-test was 74.74. In the control class, the pretest mean value was 48.50, and the post-test was 67.50. The results of the inferential statistical analysis using the independent sample t-test obtained the Sig. value of 0.067, which is greater than the value of α which is 0.05 (Sig. > α). Thus, it can be concluded that H0 is accepted, that is there is no difference between the giving question and getting answer strategy and the multilevel strategy on understanding mathematical concepts for class VII students of MTsN 5 Bulukumba. It can be concluded that there is an effect of applying the giving questions and getting answer strategy as big as the effect of applying the multilevel strategy on students' understanding of mathematical concepts.

Keywords: Question and answer strategy; multilevel strategy; mathematical concepts

1. INTRODUCTION

Education has become a pillar in improving Indonesia's human resources for nation-building. The Indonesian government has mandated the purpose of education in Law No. 20 of 2003 concerning the National Education System, namely education aims to develop the potential of students to become human beings who believe and fear Allah Almighty, have a noble character, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens (Danim, 2010). Then it was emphasized in a copy of the regulation of the Minister of Education and Culture No. 22 of 2020, which said that the ability of a nation to compete in globalization and technological innovation relentlessly depends on the quality of human resources.

The teacher is a very important role holder in teaching and learning activities. It is the teacher's duty and responsibility to plan and carry out the process of teaching and learning activities (Sopian, 2016). One of the subjects studied from elementary to college is mathematics. Mathematics plays a very important role because students' reasoning power can be processed by learning mathematics correctly. However, there are still many school students who complain about math lessons because they feel it is difficult (Sukasno, 2016).

Based on observations in class VII MTsN 5 Bulukumba on January 13, 2022, by interviewing a grade VII mathematics teacher, researchers found several problems related to understanding concepts in mathematics learning. It can be seen that when students receive mathematics learning material given by the teacher, students tend not to understand and only copy what is written by the teacher, and also, students tend not to be able to convey what has been understood, even what needs to be asked. In addition, in solving mathematics problems, students tend to need help to be able to use concepts to solve given problems. Students are engrossed in chatting with their friends and do not pay attention to lessons. From some of the problem findings described above, it can be concluded that students' understanding of mathematics learning concepts still needs to be improved. Because based on indicators of understanding concepts in mathematics learning, students are expected to be able to explain, explain, interpret and also be able to conclude the results of the learning, so strategies are needed that can be used in improving the understanding of concepts in mathematics learning.

According to Kilpatrick et al. (2017), conceptual understanding is the ability to understand concepts, operations and relationships in mathematics (Hutagalung, 2017). Students' understanding of concepts will be better if students can achieve indicators of conceptual understanding. One way that can be done to improve the understanding of concepts is the application of interesting and fun learning methods or strategies (Harfiani

& Fanreza, 2019). The ability to explain that a learning strategy is a learning activity must be done by teachers and students to achieve learning objectives effectively and efficiently.

To overcome the problems, it is necessary to develop interesting learning strategies so that students are interested in participating in learning that improves students' learning outcomes. Some strategies that can be used to improve understanding of concepts are the giving questions and getting answers strategy and the multilevel strategy (Hartini, 2021). The giving question and getting answer strategy is a learning strategy that can create an active learning atmosphere. This strategy requires students to ask and answer questions posed by their friends. Even this strategy can involve active student participation from the beginning of learning. Furthermore, the Multilevel strategy is learning in small groups by increasing maximum cooperation through learning activities by friends themselves to achieve basic competencies (Anomsari, 2011).

Based on the problems described above, researchers are interested in conducting research entitled "Comparison of Giving Quetion and Getting Answer Strategy and Multilevel Strategy toward Understanding Mathematical Concepts of Class VII Students of MTsN 5 Bulukumba" to see the understanding of mathematical concepts with the application of the giving question and getting answer strategy and multilevel strategy.

2. METHODS

The approach used in this study is a quantitative research approach. Quantitative research uses numbers to present data and analysis using statistical tests (Sohilait, 2020). This type of research is the development of a true experiment, which is difficult to carry out. This experiment has a control group but cannot fully function to control external variables that affect the implementation of the experiment (Faoziyah & Rohyati, 2019). The research design used in this study is a nonequivalent control group design. This design is almost the same as the pretest-posttest control group design. It is just that in this design, the experimental group is not randomly selected. This design can be illustrated in Table 1.

Table 1. Nonequivalent Control Group Design

Pretest	Treatment	Posttest
O_1	X_1	O_2
O_1	X_2	O_2

(Mohr, 1982)

Annotation:

O_1 : Pretest is given before teaching and learning activities for the experimental group and control group.

O_2 : Posttest is given after teaching and learning activities for the experimental group and control group.

X_1 : Application of giving question and getting answer learning strategy for the experimental group.

X_2 : Application of multilevel learning strategy for the control group.

The population in this study are all grade VII MTsN 5 Bulukumba students consisting of 3 classes, namely class VII A 21 students, VII B 20 students, VII C 22 students, where the total are 63 students. The sampling technique in this study used a simple random sampling technique with a sample of 41 students.

The technique of data analysis that researchers use is quantitative analysis, also known as statistical analysis. There are two types of statistics used to analyze data, namely descriptive statistics and inferential statistics (Dahri, 2021).

Research Variables and Definitions and Operational Variables

a. Learning Strategy (X)

The independent variable (X) is a variable that is suspected as the cause of the emergence of other variables, which is meant to be a dependent variable (Sappaile, 2010). The independent variable in this study consists of two, namely the giving question and getting answer strategy (X_1) and multilevel strategy (X_2).

1) Giving Question and Getting Answer Strategy (X_1)

The giving question and getting answer learning strategy is a strategy that involves students in learning by giving index cards, completing sentences, dividing groups and asking questions and giving answers to find out students' concept understanding abilities (Syafitri, 2017).

2) Multilevel Strategy(X_2)

Multilevel learning strategy is a learning strategy that enhances student cooperation in heterogeneous groups where students who have higher conceptual understanding skills help their less capable friends (Rahwini, 2019).

b. Conceptual Understanding

The dependent variable is the factor that is observed and measured to determine whether the independent variable is influenced. The dependent variable in this study is students' understanding of concepts in learning mathematics. Conceptual understanding (Y) is the student's ability to explain, interpret, or the ability to grasp the meaning or meaning of a mathematical concept and be able to implement this concept to solve mathematical problems, as seen in student answers on the essay test.

Descriptive Statistics

Descriptive statistics are used to analyze data (Sugiyono, 2019) by describing or describing students' understanding of mathematical concepts after following the subject matter using the giving question and getting answer strategy and multilevel strategy.

a. Mean ($\bar{x}$)

The mean is calculated using all the values in the data, that is, the sum of all data values divided by the amount of data (Nasution, 2017). The formula used to calculate the mean is as follows:

$$\bar{x} = \frac{\sum x_i}{n}$$

Annotation:

$\bar{x}$ = Mean

x_i = Data i

n = The amount of data

b. Standard Deviation

Standard deviation is the square root of the variance and indicates the standard deviation of the data from its mean value (Pratikno et al., 2020). Standard deviation is used to compare the spread or deviation of two or more data groups. If the standard deviation is small, it shows the sample value and the population gathers or groups around the calculated mean. This means that because the value is almost the same as the mean value, it is concluded that the members of the sample or population have something in common. Conversely, if the deviation value is large, the spread from the medium value is also large. The formula is:

$$\mu_{-x} = \mu \text{ and } \sigma_{-x} = \frac{\sigma}{\sqrt{n}}\sqrt{\frac{N-n}{N-1}}$$

Annotation:

σ_{-x} : Standard deviation from distributive sampling $\bar{x}$

σ : Population standard deviation

n: The size of the sample

N: The size of the population

c. Categorization

Categorization aims to place individuals into separate groups in tiers based on the attributes measured.

Table 2. Categorization Formula

Formula	Category
$X < (\mu - 1.0\sigma)$	Low
$(\pi - 1.0\sigma) \leq X < (\mu + 1.0\sigma)$	Medium
$(\mu + 1.0\sigma) \leq X$	High

(Tiro, 2008).

Annotation:

π: Ideal mean

X: Empirical score

σ: Standard deviation

Inferential Statistics

Inferential statistics are used to analyze sample data, and the results will be generalized (differentiated) for the population where the sample is taken (Rosana & Setyawarno, 2016).

a. Data Normality Test

Data normality tests are carried out to determine whether or not the data used is normally distributed. If the data is normally distributed, parametric statistics are used (Rosana & Setyawarno, 2016). If the data is not normally distributed, statistical techniques

cannot be used as an analysis tool. Instead, other statistical techniques are used which do not have to assume that the data is normally distributed. The statistical technique is nonparametric statistics.

Data normality testing technique using Chi Squared formula (X^2)

$$X^2 = \sum \frac{(f_o - f_e)^2}{f_e}$$

Annotation:

f_o: Observation frequency

f_e: Expected frequency

In the calculation, it will be obtained X^2_{count} Further, this value is compared with X^2_{table} with dk (degrees of freedom) $= (k-1)$ if $X^2_{hitung} < X^2_{tabel}$, then the data is declared normally distributed.

b. Homogeneity of Variance Test

Homogeneity testing is carried out because the researcher will generalize the final research conclusions or hypotheses (H_0 or H_1) obtained from the sample to the population. If the data is homogeneous, the sample groups come from the same population. To test the homogeneity of the data, the F test is used with the formula:

$$f_0 = \frac{\text{Largest variance}}{\text{Smallest variance}}$$

The test criteria are if $F_{count} < F_{table}$ at the real level with F_{table} obtained from the distribution of F with degrees of freedom respectively corresponding to the numerator dk and denominator dk at the level α = 0.05.

c. t-Test

The t-test used in this study is a comparative analysis of two independent samples with the formula:

$$t_{count} = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{\frac{(n_1-1){S_1}^2 + (n_2-1){S_2}^2}{n_1 - n_2 - 2}\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Annotation:

$\overline{x_1}$: The mean score of the experimental group

$\overline{x_1}$: The mean score of the control group

S_1^2 : The variance of experimental group

S_2^2 : The variance of the control group

N_1 : Number of samples in the experimental group

N_2 : Number of samples in the control group

d. Hypothesis Test

Hypothesis testing s used to find out the provisional conjectures formulated in the research hypothesis by using a two-sample t-test (Rudini, 2017).

$$H_0: \mu 1 = \mu 2 \text{ versus } H_1: \mu 1 \neq \mu 2$$

Annotation:

$\mu 1$: Average students' understanding of concepts taught using the giving question and getting answer strategy.

$\mu 2$: Average students' understanding of concepts taught using multilevel strategy

H_0 : There is no difference between the giving question and getting answer strategy and the multilevel strategy for understanding mathematical concepts of Class VII MTsN 5 Bulukumba students

H_1 : There are differences in the giving question and getting answer strategy and the multilevel strategy for understanding mathematical concepts of Class VII MTsN 5 Bulukumba students.

The research hypothesis will be tested with the following testing criteria.

1) If $t_{table} \leq t_{count} \leq t_{table}$ then H_0 accepted and H_1 rejected, means that there is no difference between the giving question and getting answer strategy and the multilevel strategy for understanding mathematical concepts of Class VII MTsN 5 Bulukumba students.

If $t_{count} > t_{table}$ then H_0 rejected and H_1 accepted, means that there are differences in the giving question and getting answer strategy and the multilevel strategy for understanding mathematical concepts of Class VII MTsN 5 Bulukumba students.

3. RESULTS AND DISCUSSION

The results of this study are based on the data analyzed, namely the data from the students' conceptual understanding test results after being given conceptual understanding test instrument, namely the pretest and posttest in class VII B as an experimental group using the giving question and getting answer learning strategy and class VII C as a control group using multilevel learning strategy carried out for two weeks and as many as four meetings per class so that it can be produced maximum data.

Description of Conceptual Understanding Test Results using the Giving Question and Getting Answer Learning Strategy

Based on the pretest and posttest given to experimental class students using the giving quetions and getting answer strategy in mathematics learning in class VII B MTsN 5 Bulukumba which has been analyzed using *SPSS v.24*, the following results were obtained.

Table 3. Description of the Results of the Pretest and Posttest Conceptual Understanding of the Experimental Class

Understanding Test	N	Minimum	Maximum	Mean	Standard Deviation
Pretest	19	20	75	49.21	17.181
Posttest	19	50	95	74.74	12.413

Analysis of the description of the prestest data showed that a fairly large standard deviation was 17.181 and analysis of the description of the posttest data showed that the smaller standard deviation of the experimental pretest class was 12.413. This means that the data is evenly distributed.

Based on the analysis above, it can be seen that the pretest and posttest results in the experimental class increased after being given treatment, with mean score difference of 25.53. The comparison of the mean score of the pretest and posttest mathematics conceptual understanding test results can be seen in Figure 1.

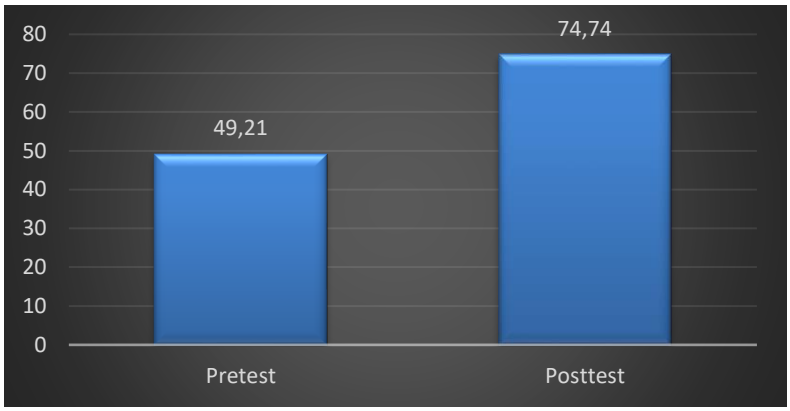

Figure 1. The Mean Score of Mathematical Conceptual Understanding Test Result in Experimental Class

If the students' mathematical conceptual understanding test results are categorized in the high, medium, and low categories, the following frequency and percentage will be obtained.

Table 4. The Distribution of Frequency and Percentage of Pretest Result for Mathematical Conceptual Understanding in Experimental Class

Category	Interval	Frequency	(%)
Low	$X < 60$	13	68%
Medium	$60 \leq X < 80$	6	32%
High	$x \geq 80$	0	0%
	Total	19	100%

Based on Table 4, it can be explained that there are 13 students with a percentage of 68% in the low category, 6 students with a percentage of 32% in the medium category. In contrast, for the high category, no students are included in that category. It can be implied that students with low score categories have the largest percentage of pretest students' mathematical conceptual understanding test results in experimental class with scores less than 60.

Table 5. The Distribution of Frequency and Percentage of Posttest Result for Mathematical Conceptual Understanding in Experimental Class

Category	Interval	Frequency	(%)
Low	$X < 60$	3	16%
Medium	$60 \leq X < 80$	10	53%
High	$X \geq 80$	6	31%
	Total	19	100%

Based on Table 5, it can be explained that there are 3 students with a percentage of 16% in the low category, 10 students with a percentage of 53% in the medium category, and 6 students with a percentage of 31% in the high category. It can be implied that students with medium grade categories have the largest percentage of posttest students' math conceptual understanding test results in experimental class with grade intervals $60 \leq X < 80$.

From the frequency distribution analysis result and the percentage of pretest and posttest test result of the experimental class understanding of mathematical concepts, it can be concluded that students' scores have increased. The following compares the pretest and posttest results of understanding mathematical concepts in experimental class presented in Figure 2.

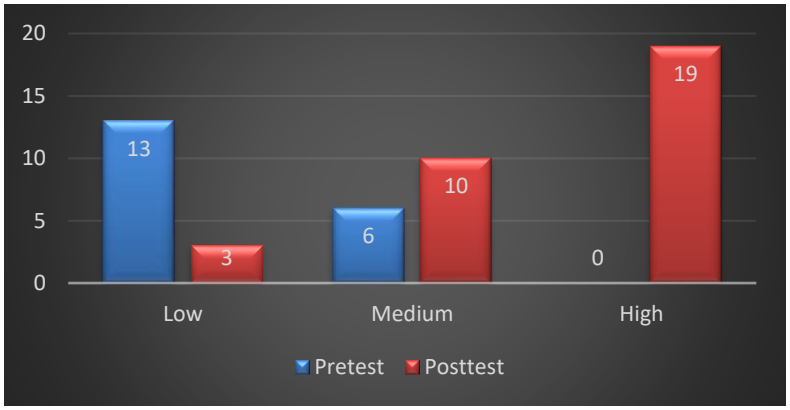

Figure 2. The Comparison of Test Results for Mathematical Conceptual Understanding in Experimental Class

In Figure 2, it can be seen that based on the grade interval, the number of students with low grades decreased significantly while the number of students with medium and high-grade categories increased significantly.

Description of Conceptual Understanding Test Results using the Multilevel Learning Strategy

Based on the pretest and posttest given to control class students using the multilevel strategy in mathematics learning in class VII C MTsN 5 Bulukumba which has been analyzed using SPSS v.24, the following results were obtained.

Table 6. Description of the Results of the Pretest and Posttest Conceptual Understanding of the Control Class

Understanding Test	N	Minimum	Maximum	Mean	Standard Deviation
Pretest	20	30	75	48.50	12.988
Posttest	20	50	85	67.50	11.528

Based on Table 6, analysis of the description of the pretest data shows that the standard deviation value is 12.988. Analysis of the description of the posttest data shows that the value of the standard deviation is 11.528. Based on the analysis above, it can be seen that the pretest and posttest results in the control class increased after treatment, with a mean score difference of 19. The comparison of the mean score of the pretest and posttest mathematical conceptual understanding test results can be seen in Figure 3.

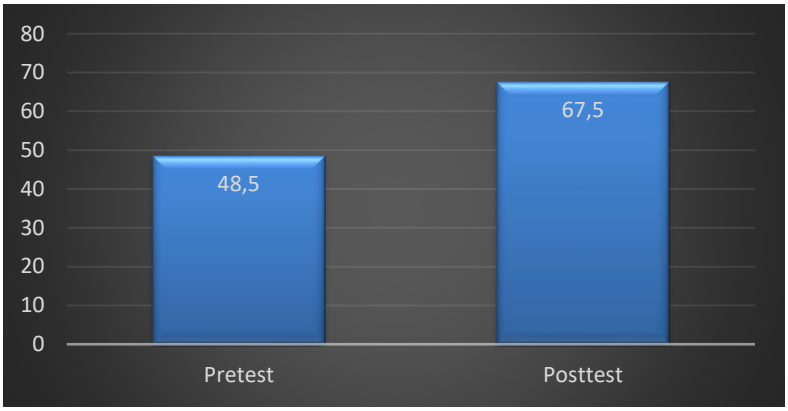

Figure 3. The Mean Score of Mathematical Conceptual Understanding Test Result in Control Class

If the students' mathematical conceptual understanding test results are categorized in the high, medium, and low categories, the following frequency and percentage will be obtained.

Table 7. The Distribution of Frequency and Percentage of Pretest Result for Mathematical Conceptual Understanding in Control Class

Category	Interval	Frequency	(%)
Low	$X < 60$	18	90%
Medium	$60 \leq X < 80$	2	10%
High	$x \geq 80$	0	0%
	Total	20	100%

Based on Table 7, it can be explained that there are 18 students (90%) who are in the low category, 2 students with a percentage of 10% are in the medium category, and no students who are included in the high category. So students with low score categories have the greatest percentage of the results of the pretest understanding of mathematical concepts in the comparison class with score intervals of less than 60.

Table 8. The Distribution of Frequency and Percentage of Posttest Result for Mathematical Conceptual Understanding in Control Class

Category	Interval	Frequency	(%)
Low	$X < 60$	8	40%
Medium	$60 \leq X < 80$	10	50%
High	$X \geq 80$	2	10%
	Total	20	100%

Based on Table 8, it can be explained that there are 8 students with a percentage of 40% in the low category, 10 students with a percentage of 50% in the medium category, and 2 students with a percentage of 10% in the high category. So it can be concluded that students in the medium value category have the largest percentage of the results of the posttest understanding of mathematical concepts in the control class with a value interval of $60 \leq X < 80$.

From the analysis of the frequency distribution and the percentage of pretest and posttest results of the test for understanding mathematical concepts in the control class, it can be concluded that the posttest interval value in the control class is greater than the pretest interval value in the control class. The following compares the results of the pretest and posttest understanding of mathematical concepts in the control class presented as a bar chart.

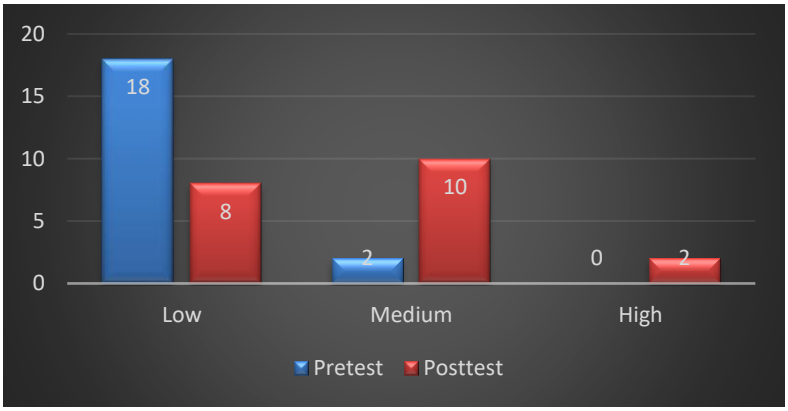

Figure 4. The Comparison of Test Results for Mathematical Conceptual Understanding in Control Class

Differences in Test Results of Understanding Mathematical Concepts between the Implementation of Giving Question and Getting Answer Strategy and Multilevel Strategy in Class VII MTsN 5 Bulukumba

In this section, it will be known whether there are differences in applying the giving question and getting answer strategy and the multilevel strategy to understanding the mathematical concepts of grade VII MTsN 5 Bulukumba students. An inferential statistical analysis will be carried out to find out this, namely testing the research hypothesis. Before conducting the analysis, a normality test and homogeneity test will first be carried out.

a. Normality Test

This normality test is intended to determine whether the data used is normally distributed. Normality tests were performed on both groups. Data can be said to be normally distributed if the sig value> α = 0.05 and can be said to be not normally distributed if sig< α = 0.05.

1) Normality test of pretest and posttest results in the experimental class

The results of the normality test data of pretest and posttest results in the experimental class using *SPSS V. 24* are as follows:

Table 9. Normality Test Results from Pretest and Posttest in Experimental Class

Variance	K-Sz	Sig.	Annotation
Pretest	0.178	0.116	Normally Distributed
Posttest	0.104	0.200	Normally Distributed

Based on Table 9, it can be seen that the significance value in the pretest and posttest results in the experimental class is greater than α=0,05. So the data from the test results of understanding mathematical concepts of grade VII B MTsN 5 Bulukumba have been normally distributed.

2) Normality test of pretest and posttest results in the control class

The results of the normality test data of pretest and posttest results in the control class using *SPSS V. 24* are as follows:

Table 10. Normality Test Results from Pretest and Posttest in Control Class

Variance	K-Sz	Sig.	Annotation
Pretest	0.178	0.116	Normally Distributed
Posttest	0.104	0.200	Normally Distributed

Based on Table 10, it can be seen that the significance value in the pretest and posttest results in the control class is greater than α=0,05. So the data from the test results of understanding mathematical concepts of grade VII C MTsN 5 Bulukumba have been normally distributed.

b. Homogeneity Test

The homogeneity test is carried out to determine whether the data used come from the same population. Pretest and posttest result data can be considered homogeneous if the significance value is based on mean > α= 0.05 and is said to be not homogeneous if the significance value based on mean < α= 0.05. The results of the pretest and posttest homogeneity tests in the experimental and control classes are shown in Table 11.

Table 11. Pretest and Posttest Homogeneity Test Results of Experimental Class and Control Class

Variance	Sig. based on mean	Annotation
Pretest	0.140	Homogeneous
Posttest	0.790	Homogeneous

Based on Table 11, it can be seen that the pretest significance value for the experimental class and the control class is 0.140> α= 0.05, so it can be concluded that the pretest result from data in class VII MTsN 5 Bulukumba is homogeneous. In addition, it can be seen that the posttest significance value of the experimental class and the control class is 0.790 > α = 0.05, so it can be concluded that the posttest result data in class VII MTsN 5 Bulukumba is homogeneous.

c. Hypothesis Test Result

The hypothesis test of this study was carried out on posttest result data from the experimental and control classes. Because the test result data has been proven to be normally distributed and homogeneous, parametric statistical tests are carried out using the t-test, namely the independent sample t-test. The following are the results of the independent sample t-test.

Table 12. Independent Samples t-Test results

Variance	T	Sig.	Annotation
Posttest	1.88	0.067	H_0 accepted

Based on the data processing results in the SPSS V.24 application in Table 12, the value of t = 1.88 and sig. = 0.067 is obtained. Where is the sig. = 0,067 > α= 0.05 so that it can be concluded that H_0 is accepted, that is, there is no difference between the giving

question and getting answer strategy and the multilevel strategy on the understanding of mathematical concepts for class VII students of MTsN 5 Bulukumba. There is no difference in the results of students' understanding of mathematical concept tests indicating an equal influence from applying the two strategies, namely the giving question and getting answer strategy and the multilevel strategy.

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