

CHAPTER III

RESEARCH METHODS

This chapter discusses about research design, population and sample, data collection contents of research instrument, the validity of the test, reliability of the test, data analysis contents of normality distribution test, homogeneity test variance and hypothesis testing.

3.1 Research Design

The research design of this study uses quantitative research and it belong to experimental research design because this study is to investigate the effect of question answer relationship strategy on reading comprehension narrative text for junior high school. The researcher uses quasi experiment. Because it is impossible to conduct the true experiment in the SMP Muhammadiyah 4 Giri. It is because classification of the class in SMP Muhammadiyah 4 Giri has been determined by the school. Whereas, true experiment need to randomize the group. It means that the researcher must change the classification of group. But here, the school did not permit the researcher to change the classification of the group.

Based on Ary (1985) a variable is an attribute that is regarded as reflecting several concepts or construct. Since this is an experimental research, there are two variables used; independent variable and dependent variable. In experimental research, it is usual to differentiate between independent variable and dependent variable. Independent variable what is varied during the experiment. It is what the researcher thinks will effect the dependent variable. While, dependent variable is what will be measured. It is what the researcher thinks will be effected during the experiment. In this study, the researcher wants to know the effect of question

answer relationship on reading comprehension at 8th grade in SMP Muhammadiyah 4 Giri. So that, the independent variable is question answer relationships and for dependent variable is reading comprehension.

In this study, the subject involves two group. That are experimental group and control group. For experimental group, the researcher give four times meeting and every meeting give one text about kinds of narrative text such as fairy tale, fable, and legend. And then, guides the students to make questions by themselves from the text. Then the researcher divided the class into 6 groups with 5 students in each group. After that the teacher ask the students to give question one by one other group. The students noted first. Because all of the questions are not directly answered. And then the teacher implement QAR strategy with explain about the types of the questions. Then, the students and teacher evaluate about result this lesson. And for control group, the researcher give conventional method.

Procedure for this study are, the researcher is to give pre-test for both groups, and then the researcher give treatment that is question answer relationship on reading comprehension in experimental groups. For giving the treatment the researcher will do for four times. While on control group, they are not given treatment. The last step is the researcher gives post-test for both groups.

The design of this research could be illustrated as follows:

Group	Pre-Test	Treatment	Post-Test
Experiment (VIII A)	Y1	(QARs)	Y2
Control (VIII B)	Y1	Without QARs	Y2

Table 3.1 The Design of Experimental Research

Where :

Y1 : The pre-test which is administered before the treatment

Y2 : The post-test which is administered after treatment

3.2 Population and Sample

According to Mc Millan (1992) population is the group to which the research result would be generalized and its includes all individuals with certain specified characteristics. The population of the study is the first semester of 8th grade at SMP Muhammadiyah 4 Giri in the academic year 2016-2017. In the 8th grade, there are 2 classes, they are VIII A, and VIII B. In this study the researcher will conducted two classes as the sample. First class for the experimental group and the second class for control group where VIII A will be control group and VIII B will be experimental group. The total number of the sample both classes are 48 students. VIII A consist of 24 students and VIII B consist of 24 students.

In this study, the researcher uses cluster sampling. She takes two classes as the sample based on the students' ability in reading comprehension. The researcher takes VIII A class and VIII B class because the students has the equal characteristics in English reading comprehension as shown by result of homogeneity test.

3.3 Data Collection

Data collection consists of research instruments, validity and reliability, in which the researcher explains bellow:

3.3.1 Research Instrument

Research instrument is an important role in doing the research. In this study uses test in collecting the data. There are two test that are used

by the researcher, those are pre-test and post-test. Pre-test will be administered before the researcher conducts the treatment and it is to find out the initial different of the both groups. And post-test will be administered after the researcher conducts the treatment to experimental group, and gives some exercise to the both in a period of time. It finds out whether the experiment group makes progress in their reading comprehension. The items of pre-test and post-test are 40 items of multiple choices. Before giving pre-test and post-test, the researcher will try out to measure the validity and reliability of the test to make sure that the test valid.

3.3.1.1. Try Out

Try-out test was conducted before pre-test and post-test. The purpose of tryout test are that to get the validity and reliability of the test that is going to be used and also to know the appropriate test items for the students. The try out test was tested to the students who are not given the treatment and the post-test but have same characteristics as the students who was given the treatment. Try out will be tested in MTS Masyhadiyah Giri, while the test for pre-test and post-test will be tested in SMP Muhammadiyah 4 Giri.

In this study the try out was conducted at eighth grade VIII A and VIII B at MTS Masyhadiyah Giri Gajah. This class consists of 48 which VIII A 24 students and VIII B also, and the

number of the test items was 30 questions in the form of multiple choices.

The result of the validity and reliability was from the 30 items the researcher had 20 items was accepted and 10 items was rejected.

3.3.1.2. Pre-test

Pre-test is done by the both groups. It is conducted to know the previous ability of both groups especially on experiment group in their reading comprehension. They are asked to read the text and answered the question followed. The item of pre-test are 20 items of multiple choices. They have limited time to conduct it. Book and dictionary are not allowed. The questions of the pre-test are related to their English material what will be learned

3.3.1.3. Post-test

Post-test is distributed to both groups to find out whether or not the students make progress in their reading comprehension ability. It is like pre-test. The procedure of the post-test has the same procedure with the pre-test, but this post test was conducted after giving the all treatment to the experimental group only. It is to measure the result of the treatment. It is success or not.

3.3.2 The Validity of Test

Before conducting post-test and pre-test as instrument of the research. The test should be tried out in terms of its validity and reliability on order to check the validity of the test the researcher did it into two steps. Validity is the most important in developing and evaluating of measuring instruments (Ary, 2002). Those were checking content validity and construct validity. To determine the content validity, by checking with the syllabus, the researcher asked the English teacher is help to check the instrument validity and also based on scores criteria.

The researcher used construct validity for checking validity of test items by giving try out to the different class of sample for analyzing items of the test which one is valid or not valid. Then, the researcher checked them using SPSS statistics 16.00 for descriptive statistic and use Cronbach' Alpha as correlation as coefficient. The researcher used Cronbach' Alpha because the result of data is more accurate. This is the formula for testing validity of the test using correlation product moment:

$$r_{xy} = \frac{N(\sum Xy) - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\} \{ \sum Y^2 - (\sum Y)^2 \}}}$$

Where :

- r_{xy} : The coefficient of correlation X and Y variable or validity of each items
- N : The number of students/ subject participating in the test
- X : The sum of X scores
- Y : The sum of Y Scores
- $\sum Y$: The sum of total score for each students.
- $\sum X$: The sum of total score in each item.
- $\sum Xy$: The of multiple score from each student with the total score in each item
- $\sum X^2$: The sum of the square score in each item,
- $\sum Y$: The sum of total score from each students

By SPSS statistic 16.0, the steps for determining validity of the test are:

1. Open SPSS 16.0 program
2. Choose File, New data
3. Input the data in the data view
4. For counting the test validity, click analyze menu, scale, reliability analysis.
5. Click statistic, give checklist in descriptive box, checklist item, scale and scale if item deleted, on inter item checklist correlation and click continue and then click OK.
6. The result of validity will appear in the output

3.3.3 The Reliability of Test

In this study, the researcher used Cronbach's Alpha for measuring reliability of the test. The formula of Cronbach's Alpha is :

$$r = \left(\frac{k}{k-1} \right) \left(1 - \frac{\sum Si^2}{St^2} \right)$$

Where:

r : Cronbach's Alpha coefficient
k : total of test items
 $\sum Si^2$: total of test variance
 St^2 : total variance

After knowing Cronbach's Alpha coefficient, we must consider in this

George and Mallery (2003)

> .9 = Excellent
> .8 = Good
> .7 = Acceptable
> .6 = Questionable
> .5 = Poor
< .5 = Unacceptable

In SPSS 16.00, there are some procedures in measuring reliability of the test such as:

1. Open SPSS 16.00 program
2. Choose File, New Data
3. Input the data in the data view
4. Click analyze, click scale and click reliability analyze

5. It will appear dialogue box named reliability analysis. Input all variables in items box then choose alpha in the model
6. Click OK

If Cronbach's Alpha value $>$ r-table, the test items are reliable but if Cronbach Alpha Value $<$ r-table, the test items are not reliable.

3.3.4 General Schedule of Research Implementation

The researcher takes fourth meeting, because it need many times to apply the technique, whereas the classes are not ours. The researcher cannot take many meeting, it can drag feet school learning activity.

No	Time	Activity
1	Desember 5 th , 2016	Sending Permission Letter to MTS Masyhadiyah for Try Out
2	December 6 th , 2016	Sending Permission Letter to SMP Muhammadiyah 4 Giri
3	Desember 7 th , 2016	Asking Permission to School Principle To SMP Muhammadiyah 4 Giri
4	Desember 8 th , 2016	Asking Permission to School Principle MTS Masyhadiyah Giri
5	Desember 7 th , 2016	Try Out Pre Test at MTS Masyhadiyah Giri
6	Desember 8 th , 2016	Pre-test for Experimental Group
7	Desember 8 th , 2016	Pre-test for Control Group
8	January 5 th , 2016	First Treatment for Experimental Group by Using QAR Strategy
9	January 5 th , 2016	First Treatment for Control Group by Using Traditional Method
10	January 6 th , 2016	Second Treatment for Experiment Group by Using QAR Strategy

11	January 6 th , 2016	Second Treatment for Control Group by Using Traditional Method
12	January 7 th , 2016	Third Treatment for Experiment Group by Using QAR Strategy
13	January 7 th , 2016	Third Treatment for Control Group by Using Traditional Method
14	January 8 th , 2016	Fourth Treatment for Experimental Group by Using QAR Strategy
15	January 8 th , 2016	Fourth Treatment for Control Group by Using Traditional Method
16	January 9 th , 2016	Try Out Post Test at MTS Masyhadiyah Giri
17	January 10 th , 2016	Post Test for Experimental Group
18	January 10 th , 2016	Post Test for Control Group

Table 3.3.4.1

3.4 Data Analysis

Data analysis method is very important in a research in conducting a research, it is requirement to analyze the data in order to interpret the data obtained from the field. The data analysis is carrying out in order to answer the research problem with the data obtained through pre-test and post-test. The research analyze the data by using independent sample t-test. Since the samples are small and the groups are independent, the t-test for independent samples are carried out to determine whether there is any difference between experiment group and control group. The researcher used SPSS version 16.0 to compute descriptive statistic, descriptive statistic are conducted in order to find the effect

of the treatment whether there is significant or not by using question answer relationship.

Assumptions for the independent t-test where: (1) independence test: observation within each sample must be independent (they do not influence each other), (2) normal distribution: The scores in each population must be normally distributed and (3) homogeneity of variance: the two populations must have equal variances (the degree to which the distributions are spread out is approximately equal). The steps of analyzing the result are:

Arikunto (2010:278) classified the data analysis method into three parts are: Preparation, Tabulation and Making Conclusion. The data analysis method used in this research is t-test. T-test is used to analyze the data and to compare the mean difference of the pre-test and post-test and this research wants to know the effectiveness of using scaffolding on reading comprehension of the Eight grade students of SMP Muhammadiyah 4 Giri in the academic year 2016/2017

3.4.1 Normality Distribution Test

In this study, Kolmogorov Smirnov Sample Test in SPSS Version 16.0 is used to analyze the normal distribution. It is aimed to find whether or not the distribution of pre-test score in the two groups are normally distributed. In this case, the result of normality the distribution is also used to find out whether or not the hypothesis that had been determined is accepted.

3.4.2 Homogeneity Test of Variance

The analysis of variance, assume that variance are equal across group or samples. For homogeneity test, the researcher uses Levene's *test*

of homogeneity In SPSS 16.0 version. The test of Levine's test, or P ,

defines as follow:

$$P = \frac{(N - k) \sum_{i=1}^k N_i (Z_i - Z_{...})^2}{(k - 1) \sum_{i=1}^k \sum_{j=1}^{N_i} (Z_{ij} - Z_i)^2}$$

Where:

- P is the result of the test,
- K is the number of different groups to which the sample belong,
- N is the total number of samples,
- N_i is the number of samples in the i^{th} group,
- Y_{ij} is the value of the j^{th} sample from the i^{th} group,

$$Z_{ij} = \left\{ \begin{array}{l} |Y_{ij} - \bar{Y}_i|, \bar{Y}_i \text{ is a mean of } i\text{th group} \\ |Y_{ij} - \hat{Y}_i|, \hat{Y}_i \text{ is median of } i\text{th group} \end{array} \right\}$$

The significance of P is tested against $F(\alpha, k - 1, N - k)$ where F is a quintile of the F test distribution, with $k - 1$ and $N - k$ it is degrees of freedom, and α is the chosen level of significance (0.05).

3.4.3 Hypothesis Testing

Independent t-test was used to find out the significant differences between experimental and control groups. Here were steps of t-test calculation:

The first step was stating the hypothesis and setting the alpha level at 0.05 (two tailed test). In this researcher, the hypothesis used was a null hypothesis that said, "There is no significant difference on the effectiveness of Question Answer Relationship to teach reading comprehension between Experimental and control group

The hypothesis can be formulated as follow :

H1 (null hypothesis) is $\mu_1 - \mu_2 = 0$ ($\mu_1 = \mu_2$)

Alternatives hypothesis is $\mu_1 - \mu_2 \neq 0$ ($\mu_1 \neq \mu_2$)

- H1 : Reading comprehension using question answer relationship
 H2 : Reading comprehension without using question answer relationship

Hypothesis testing in this research was :

- H0 : There is no significance difference on the effect of question answer relationship strategy in reading comprehension between experimental and control group
 H1 : There is significance difference on the effect of question answer relationship strategy in reading comprehension between experimental and control group

The second step was finding t-value using independent t-test formula and comparing the probability with the level of significance for testing the hypothesis. Determining t-critical in table t-(0,05) df, the researcher compared t-observed and t-critical. If $t_{obs} < t_{critical}$, the researcher should accept the null hypothesis and if $t_{obs} > t_{critical}$, it means the researcher can reject the null hypothesis and another word. The researcher can accept the alternatives hypothesis.

T-test was calculated to find out the comparison of two means between experimental and control group pre and post-test. In analyzing the data, the researcher used independent t-test formula. The formula used in calculating t-test is

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{S_{\bar{x}_1 - \bar{x}_2}}$$

Where:

$$S_{\bar{x}_1 - \bar{x}_2} = \sqrt{\frac{S^2_{pooled}}{n_1} + \frac{S^2_{pooled}}{n_2}}$$

Pooled variance: the average of the two sample variances, allowing the larger sample to weight more heavily.

$$S_{pooled}^2 = \frac{(df_1)s^2_1 + (df_2)s^2_2}{df_1 + df_2} \quad \text{OR} \quad S_{pooled}^2 = \frac{SS_1 + SS_2}{df_1 + df_2}$$

df_1 =df for 1st sample; n_1-1

df_2 =df for 2nd sample; n_2-1

Formula:

Estimated Standard Error of the Difference

$$S_{\bar{x}_1 - \bar{x}_2} = \sqrt{\left(\frac{SS_1 + SS_2}{n_1 + n_2 - 2}\right) + \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

Clearly, the result of the test were subjected to the following statistical procedures. To calculate t-test, the researcher used SPSS (Statistical product and Service Solution) version 16.00. The post of experimental and control groups were analyzed by using SPSS version 16.00 with the following procedures. The first procedure was inserting the post test data of both experimental and control groups using the data view. The seconds procedures were going to the analyze Menu, selecting compare was interpreting t-test output, automatically it could answer to the research questions about the comparison between two groups.

In short, the primary data was collected by means of pre-test and post-test to find out the significance on the effect of question answer relationship strategy in reading comprehension.