CHAPTER III

RESEARCH METHOD

This chapter presents research design, population and sample, variable and data sources, research instrument, validity and reliability testing, normality and homogeneity testing, data collecting method and data analysis.

A. Research Design

According to Ary et al (2010:19) "educational research is a way in which people acquire dependable and useful information about the educative process." It means the researcher goes to school where the educational process is done. The research is done accurately and carefully on observing phenomena, activities and teaching learning process to find new information which is useful for the researcher. Hence, the researcher should take the suitable research design and follow the design to make the research successful.

In this research, the researcher used an experimental design that is a quantitative approach. Quantitative is a research of which the data is numeric or number. Ary et al (2010:22) state quantitative research uses objective measurement to gather numeric data that are used to answer questions or test predetermined hypothesis. Experimental research involves a study of the effect of the systematic manipulation of one variable on another variable. The manipulated

variable is called the experimental treatment or the independent variable**.** The observed and measured variable is called the dependent variable.

Moreover, Ary et al (2010:265) argue that an experimental is a scientific investigation in which the researcher manipulates one or more independent variables, controls any other relevant variables, and observes the effect of the manipulations on the dependent variable(s). This is parallel with Lodico, Spaulding and Voegtle (2006:178) that experimental research is a research which is the researcher controls or manipulates how groups of participants are treated and then measures how the treatment affects each group.

Experimental design is classified into three designs, they are pre-experimental design, quasi-experimental design, and true-experimental design (Ary, Jacobs and Sorensen, 2010:302). This research used use pre-experimental research design that is a quantitative approach with one group pretest-posttest design. The researcher used pre-experimental because it provides little or no control of extraneous variables. Therefore, the researcher use one group and conducted pre-test and post-test to see the result of the treatment.

In one group pretest-posttest design, a single group is measured both before and after being taught by using the treatment. The procedures of one group pretest-posttest design involves as follows:

1. Administering a pre-test before applying the treatment with the purpose of measuring the vocabulary achievement of first grade student of MTs Al Huda Bandung.

2. Applying the experimental treatment teaching vocabulary by using secret message game to the subject, that is the first grade student of MTs Al Huda Bandung.

3. Administering a post-test after applying the treatment with the purpose of measuring the vocabulary achievement of first grade student of MTs Al Huda Bandung.

Table 3.1 The Diagram of One Group Pretest-Posttest Design

Pre-test	Treatment	Post-test
Y_1	X	Y_2

Using pre-experimental research design with one group pretest-posttest, the researcher wanted to know whether there was significant different of student's vocabulary achievement before and after being taught by using Secret Message Game at first grade student of MTs Al Huda Bandung. This experimental research consist of two variables, they are independent variable and dependent variable. The independent variable is the treatment that is used by the researcher in this research is Secret Message Game. And the dependent variable is the subject of the research that is measured by the number of score by giving test before and after being taught by using the treatment, that is students' vocabulary achievement. Thus, the subject of the research is the seventh C students of MTs Al Huda Bandung.

B. Population and Sample

1. Population

Population is all students or object of the research. According to Creswell (2012:142), population is a group of individuals who have the same characteristic. In practice, quantitative researcher samples' from lists and people available. A target population (or the *sampling frame*) is a group of individuals (or a group of organizations) with some common defining characteristic that the researcher can identify and study. Ary, Jacobs and Sorensen (2010:148) state that population is defined as all members of any well-defined class of people, events, or objects. In this study, the populations are all of the first grade students of MTs Al Huda Bandung which consist of seven classes (A, B, C, D, E, F, and G).

Table 3.2 List of Population

Class	Female	Male	Total
VII A	10	7	17
VII B	8	12	20
VII C	13	15	28
VII D	12	17	29
VII E	14	17	31
VII F	12	17	29
VII G	14	14	28
Total	83	99	182

2. Sample

From the target population, the researcher then selects the sample to conduct the research. According Creswell (2012:142), a sample is a subgroup of

the target population that the researcher plans to study for generalizing about the target population. In an ideal situation, the researcher selects a sample of individuals who are representative of the entire population. Ary, Jacobs and Sorensen (2010:148) state sample is a portion of a population.

Selection of the sample is an important step in a research because it is impossible for the researcher to treat all of the population. In this research, the researcher chooses seventh C class that is consist of 28 students (15 males and 13 females) at MTs Al Huda Bandung, Tulungagung in the academic year 2015/2016. There is one group in pretest-posttest that are chosen by purposive sampling and advised by the English teacher in MTs Al Huda Bandung. The researcher decided to choose the class because the English teacher suggested using the seventh C class to conduct the research. The teacher suggested using the class because the students in the class include into active students and will be good to give treatment for them.

C. Variables

According to Ary, Jacobs and Sorensen (2010:37) a variable is a construct or a characteristic that can take on different values or scores. There are two types of variable; they are classified as independent variable and dependent variable.

1. Independent Variable

Independent variable is the variable which influences dependent variable. According to Ary et al (2010:37) independent variables are antecedent to dependent variables and are known or are hypothesized to influence the dependent variable, which is the outcome. Independent variable in this research was Secret Message Game.

2. Dependent Variable

Dependent variable is the variable which is influenced by independent variable. According to Ary, Jacobs and Sorensen (2010:26) the observed and measured variable is called the dependent variable. Dependent variable in this research was the students' vocabulary achievement.

D. Research Instrument

Instrument had an important function in this research. Instrument was a tool in collecting data that are necessary in a research. According to Creswell (2012:157), instrument is a tool for measuring, observing, or documenting quantitative data, an instrument is to measure the variables in a study and it may not be available in the literature or commercially. In this case, researchers have to develop their own instrument with a long and difficult process. There are some steps in developing instrument, they are; identifying the purpose of the instrument, reviewing the literature, writing the questions, and testing the questions with

individuals similar to those the researcher plan to study. In this research, the instrument was test. “A test is a set of stimuli presented to an individual in order to elicit responses on the basis of which a numerical score can be assigned” (Ary, Jacobs and Sorensen, 2010:201). To get the score of students’ vocabulary achievement, the researcher used test. There are two kinds of test, those are; pre-test and post-test.

1. Pre-Test

To know the students’ vocabulary ability before the treatment process, in this case is Secret Message Game, the researcher gave pre-test. The test was given to know the students’ basic competence and their prior knowledge before being taught by using the treatment. The researcher gave the test that contains 30 items with 3 parts of test. The first part is cloze test consist of 15 items. Second is matching test consist of 10 items. The last is arranging random letter and write down the meaning consist of 5 items. The test was administered on March, 4th 2016.

2. Post-Test

The post-test was given after the students were taught by using Secret Message Game to know their vocabulary mastery after the treatment process. The test items in the pre-test and post-test are exactly same. The researcher gave the test that contains 30 items with 3 parts of test. The first part is cloze test consist of 15 items. Second is matching test consist of 10 items. The last is arranging

random letter and write down the meaning consist of 5 items. The test was administered on March, 15th 2016.

E. Try Outing Project of the Instrument

Before the test was administered to the students, the researcher conducted a Try-Out of the test on March 4th 2016. The purpose of conducting the try-out of the test is to achieve the Validity and Reliability of the instrument. The test contains 30 items in 3 parts. The first part is cloze test consisting of 15 items. Second is matching test consisting of 10 items. The last is arranging random letter and write down the meaning consisting of 5 items.

The scoring rubrics for random letter were presented as follow:

Table 3.3 Scoring Rubric

Aspect	Score
The vocabulary writing and the meaning are correct.	7
The vocabulary writing is correct, the meaning is incorrect.	6
There is a little mistake in vocabulary writing, the meaning is correct.	5
There is a little mistake in vocabulary writing, the meaning is incorrect.	4
There are many mistakes in vocabulary writing, the meaning is correct.	3
There are many mistakes in vocabulary writing, the meaning is incorrect.	2
There are many mistakes in vocabulary writing, there is no meaning	1
The vocabulary writing is totally incorrect, the meaning is incorrect.	0

In the process of scoring, the researcher applied inter-rater. The results of scores taken from two scores were present as follow:

Table 3.4 The Students' Score in Try Out

No.	Students	Scorer 1	Scorer 2
1.	AA	79	75
2.	AAP	75	70
3.	AAPS	60	65
4.	API	65	70
5.	CTA	68	68
6.	DK	80	75
7.	DS	66	62
8.	FRK	77	75
9.	FTA	68	70
10.	INR	76	75
11.	KM	60	56
12.	MDZ	57	68
13.	MFR	70	65
14.	MIF	78	70
15.	MNM	75	72
16.	MR	60	65
17.	RAP	62	60
18.	RP	59	65
19.	ULN	73	70
20.	ZPS	68	72

In this research, the students' scores were gotten by inter-rater reliability. It means was the researcher and the researcher's friend got two sets of students' scores.

F. Validity and Reliability

Measurement is always be used in quantitative research. According to W. Creswell (2012:151), instrument is a tool for measuring, observing, or documenting quantitative data. Ary, Jacobs and Sorensen (2010:224) state that, quantitative always depend on measurement. Two very important concepts that researchers must understand when they use measuring instrument are validity and reliability.

According to Creswell (2012:159) reliability and validity are bound together in complex ways. These two terms sometimes overlap and at other times are mutually exclusive. Validity can be thought of as the larger, more encompassing term when assess the choice of an instrument. Reliability is generally easier to understand as it is a measure of consistency. If scores are not reliable, the scores are not valid; scores need to be stable and consistent first before the scores can be meaningful.

The ideal situation exists when scores are both reliable and valid. So, the scores need to be accurate and consistent to make them meaningful.

1. Validity

Validity should measure what is supposed to measure. The measurement of validity is accurate. According to Ary, Jacobs and Sorensen (2010:225) validity is the most important consideration in developing and evaluating measuring

instrument. Creswell (2012:159) state that, Validity is the development of sound evidence to demonstrate that the test interpretation (of scores about the concept or construct that the test is assumed to measure) matches its proposed use. According to Isnawati (2014:27), there are four types of validity. They are content validity, criterion-related validity, construct validity and face validity. In this research, the researcher emphasized on the content validity to know the validity if the instrument.

A test is said to have content validity if its content constitutes a representative sample of the language skills, structures, etc. being tested (Isnawati, 2014:27). The test should appropriate and includes the sample which is relevant with the purpose of the test. The researcher made this test based on the course objectives in the syllabus of first grade of Islamic Junior High School Al Huda Bandung.

Table 3.5 Scoring Rubric

No.	Competency Indicators	Test Items	Score
1.	The students are able to answer questions of cloze test.	15	45
2.	The students are able to answer the questions of matching test.	10	20
3.	The students are able to answer the questions of arranging random letter and writing down the meaning.	5	35
	Total	30	100

2. Reliability

Reliability is the results of assessment in producing the score on different testing are consistency. According to Ary, Jacobs and Sorensen (2010:236) the reliability of measuring instrument is the degree of consistency with which it measures whatever it is measuring. Creswell (2012:159) state that, reliability means that scores from an instrument are stable and consistent. Scores should be nearly the same when researchers administer the instrument multiple times at different times. Also, scores need to be consistent. When an individual answers certain questions one way, the individual should consistently answer closely related questions in the same way. According Isnawati (2014:18), reliable test is consistent and dependable. Accordingly, if students are given the same test in the different time, the result should be similar.

There are some ways to get reliability coefficient. According Isnawati (2014:20), they are test-retest method, alternate forms method, split half method, kuder-richardson reliability and rater reliability.

In this test, the researcher used test-retest method. To use test-retest method, the researcher should get the two sets of scores for comparison. Test retest method is the most obvious way of obtaining these is to get a group of subjects to take the same test twice. The researcher used test retest method where the researcher examines the test twice with the same respondence in the different time. After that, the researcher analyzed the correlation of two scores (pre-test and

post-test) by using Pearson correlation which is called Pearson Product-Moment. The researcher used SPSS 16.0.

Table 3.6 Reliability by using Pearson Product Moment Correlation

Correlations

		VAR00001	VAR00002
VAR00001	Pearson Correlation	1	.754**
	Sig. (2-tailed)		.000
	N	20	20
VAR00002	Pearson Correlation	.754**	1
	Sig. (2-tailed)	.000	
	N	20	20

**. Correlation is significant at the 0.01 level (2-tailed).

From the correlation analyzing in table 3.6, the researcher got the correlation of two score. The value of correlation is 0.754 it means that correlation of score 1 and 2 very strong and from the explanation above, it was found that this test is reliable.

G. Normality and Homogeneity

1. Normality

Normality test is a test used to measure the data whether it has normal distribution or not. Normality test is intended to show that the sample data come from a normally distributed population. In this research, to know the normality the researcher used One-Sample Kolmogorov-Smirnov test with SPSS 16.0.

The hypotheses for testing normality are:

a. H_0: Data is in normal distribution.

b. H_1: Data is not in normal distribution.

Critic area is in which H_0 is rejected when the significance value is lower than 0.05 ($\alpha = 5\%$). The analysis is as follows:

Table 3.7 Data Analysis by using One-Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test

		VAR00001	VAR00002
N		20	20
Normal Parameters[a]	Mean	68.8000	68.4000
	Std. Deviation	7.49456	5.25557
Most Extreme Differences	Absolute	.146	.170
	Positive	.130	.105
	Negative	-.146	-.170
Kolmogorov-Smirnov Z		.653	.758
Asymp. Sig. (2-tailed)		.788	.613

a. Test distribution is Normal.

Based on the output from SPSS 16.0 in table 3.7 are known that the significance value from pretest 0.788 and from posttest is 0.613. Both value from pretest and posttest are bigger than 0.05. The sig/p value on pretest is 0.788 and it is bigger than 0.05 (0.788>0.05). It means that H_0 is accepted and H_1 is rejected and the data is in normal distribution. Then, for posttest score the value sig/p is 0.613 and it is bigger than 0.05 (0.613>0.05). It also means that H_0 is accepted and H_1 is rejected and the data is in normal distribution. So, it can be interpreted that both of data (pre-test and post-test score) are normal distribution.

2. Homogeneity

Homogeneity test is intended to know whether the variance of the data is homogeneous or not. In this research, the researcher wants to know the variance score in the class sample. The procedure used to test the variance of homogeneity is by determining F_{max} value. In homogeneity test, F calculation should be lower than F theoretic (table).

$$S_X{}^2 = \sqrt{\frac{n.\sum X^2 - \left(\sum X\right)^2}{n(n-1)}} \qquad S_Y{}^2 = \sqrt{\frac{n.\sum Y^2 - \left(\sum Y\right)^2}{n(n-1)}}$$

$$S_X{}^2 = \sqrt{\frac{28.115914 - (1778.1778)}{28\ (28-1)}}$$

$= \sqrt{111,519}$

$= 10,560$

$$S_Y{}^2 = \sqrt{\frac{28.164573 - (2135.2135)}{28\ (28-1)}}$$

$= \sqrt{65,898}$

$= 8,118$

$SD_1 2 = 10,560$

$SD_2 2 = 8,118$

$$F_{max} = \frac{SD_{besar}}{SD_{kecil}}$$

$$= \frac{10,560}{8,118}$$

$$F_{max} = 1,301$$

Degree of freedom (df_1) = N_1-1 = 28-1 = 27

(df_2) = N_2-1 = 28-1 = 27

The calculation shows the result of F_{max} is 1.301. Furthermore, the homogeneity is fulfilled if F_{max} calculation is lower than F table. The value of F table in 5 % level and df1=df2 = 27 is 4.21 it can be said that the result of F_{max} calculation is lower than F table or $F_{table} > F_{calculation}$ (4.21 > 1.30), it means that the variance value in the class sample based on pre-test and post-test is homogeneous.

H. Data Collecting Method

Data collecting method is a method to collect data in a research. In this research, the researcher collected the data by administering test, which is achievement test. According to Isnawati (2014:14), achievement test is kind of test that establish how successful individual students, group of students or the course have been in achieving objectives. The test is used to measure the students'

vocabulary achievement before and after being taught using Secret Message Game.

The procedures of collecting data are as follows:

1. Pre-Test

Pre-test is a test given to students before they are taught by using treatment, in this case is Secret Message Game. According to Lodico, Spaulding and Voegtle (2006:178) a pretest is a test given before the experimental treatment. This is parallel with Creswell (2012:297) a pretest provides a measure on some attribute or characteristic that assess for participants in an experimental before they receive a treatment. This test was used to know the students' basic competence in vocabulary before get the treatment.

The pre-test was administered to the students at the first meeting on March 4th 2016. The researcher gave the test that contains 30 items with 3 parts of test. The first part is cloze test consist of 15 items. Second is matching test consist of 10 items. The last is arranging random letter and write down the meaning consist of 5 items. The total of students who took the pre-test was 28 students.

2. Post-Test

After the treatment process has been given to students, the researcher administered post-test. According to Creswell (2012:297) a posttest is a measure on some attribute or characteristic that is assessed for participants in an

experiment after a treatment. This is in line with Lodico, Spaulding and Voegtle (2006:178) that a posttest is a test given after the experimental treatment. This test was used to know how significant the treatment influence students' vocabulary ability.

The post-test is administered to the students at the last meeting on March 15th 2016. The researcher gave the test that contains 30 items with 3 parts of test. The first part is cloze test consist of 15 items. Second is matching test consist of 10 items. The last is arranging random letter and write down the meaning consist of 5 items. The total of students who took the pre-test was 28 students.

I. Data Analysis

In this research, the researcher used a quantitative data analysis technique, and the data analyzed by using statistical method. This technique is used to find the significant on the students' score before and after taught by using Secret Message Game. To know the effectiveness of Secret Message Game in teaching vocabulary, the data was collected from students' score in pre-test and post-test. The data collected was processed by comparing the score of pre-test and post-test to see whether there is significant difference after being taught by using the treatment. The data was analyzed by using Paired-Samples T-test at SPSS 16.0 for windows.

The formula of t-test as follows:

1. The researcher finds out the mean of pre-test (x) and mean of post-test (y), the formula is:

$$x = \frac{\sum x}{N}$$

$$y = \frac{\sum y}{N}$$

Where:

$\sum x$: Total score of pre-test

$\sum y$: Total score of post-test

N : total number of students

2. Then, the researcher finds out the mean of differentiate pre-test and post-test, the formula used is follow:

$$Md = \frac{\sum d}{N}$$

Where:

Md : the mean of differential pre-test and post test

$\sum d$: sum of different between post-test and pre-test

N : total number of students

3. Next, the researcher finds out the data percentage, the researcher used formula:

$$P = \frac{f}{n} \; x \; 100\%$$

Where:

P : percentage of data

f : frequency of the counted value

n : number of students

4. After that, the researcher finds out the standard deviation, the formula used is:

$$S = \sqrt{\frac{\sum X^2 - \frac{\sum(x)^2}{N}}{N-1}}$$

$$S = \sqrt{\frac{\sum y^2 - \frac{\sum(y)^2}{N}}{N-1}}$$

Where

S : standard deviation

$\sum X^2$: sum of pre-test quadrate score

$\sum x$: sum of pre-tes score

$\sum Y^2$: sum of post-test quadrate score

$\sum y$: sum of post-test score

N : number of students

5. Then, the researcher finds out the total number of quadrate deviation ($\sum X^2 d$), the formula is:

$$\sum X^2 d = \sum d^2 - \frac{(\sum d)^2}{N}$$

Where:

$\sum X^2 d$: total number of quadrate deviation

$\sum d$: sum of different between post-test and pre-test

N : number of students

6. Next, the researcher finds out the t-test by using formula:

$$t_{count} = \frac{Md}{\sqrt{\frac{\sum x^2 d}{N\,(N-1)}}}$$

where:

Md : mean different of pre-test and post-test

$\sum x^2$ d : total of quadrate deviation

N : number of students

7. Finally the researcher looks for t-table distribution with significant 5%

df = N-1

where:

df : degree of freedom

N : number of students

The criteria for accepting or rejecting the hypothesis are: if the significance value bigger than 0.05 means that H_0 is rejected and H_1 is accepted. On contrary, if the significance value smaller than 0.05 means that H_0 is accepted and H_1 is rejected.