

CHAPTER III

RESEARCH METHOD

This chapter presents six topics dealing with the research method. Those are: research design, population and sample, data collection method, research instrument, validity and reliability testing, and data analysis.

A. Research Design

In this research, the researcher used pre experimental method with quantitative approach, because the experimental method is the only method of the research that can truly test hypotheses concerning cause and effect relationship. In research design is the guide to how the research was constructed and carried out. It means that be the process includes planning and doing the research. This research was intended to investigate the effectiveness of using word square game in teaching vocabulary towards the students' mastery of vocabulary of the second grade at SMP Negeri 2 Sumbergempol.

In an experimental study, the researcher manipulates at least one independent variable, controls over relevant variables and observes the effect on one or more dependent variables (Gay, 1992:298). The steps in an experimental study are basically the same as for other types of research: selection and definition of a problem, selection of subjects and measuring instruments, selection of a design, execution of procedures, analysis of data and formulation of conclusions.

In experimental study, the researchers is in on the action from the very beginning; the researcher from or select the groups, decide what is going to happen to each group, tries to control or measure the effect on the group at the end of the study.

The present research conducted an experimental teaching using a certain game, word square. It had two variables, the teaching game as the independent variable, meanwhile and the students' achievement as the dependent variable. It is widely know that in an experimental study, the researcher manipulates at least one independent variable, controls over relevant variable, and observes the effect on one or more independent variables. This manipulation of the independent variable is the one characteristic that differentiates all experimental research from the other methods of the research.

An experimental typically involves two groups, an experimental group and a control group (Gay, 1992:299). The experimental group typically receives new or novel treatment, a treatment under investigation, while the control group usually either receives a different treatment or it is treated as usual. The control group is needed for comparison purposes to see if the new treatment is more effective than the usual or traditional approach, or to see if one approach is more effective than another. Experimental research can be done in the laboratory, in the class and in the field too. In this research, the experimental research will be done in the class with taking students as population.

In this research, the researcher used pre experimental with one group pretest-posttest design. Before, pretest, research gave to the students try out. The try out

gave in different students and class. Before giving treatment called pretest and after giving treatment called posttest. Experimenter used the same subject as control group and experimental group by giving different phases to the different time.

So that ways, this research used pre experimental design by comparing between the experimental group (x) and the control group (y). The researcher took A class as research sample through random process. The class before taught using word square game was indicated as a control group. This group with 26 students was given test, which functioned as pretest. This pretest used to observe and measure the students' ability in their vocabulary. Then done pretest, the students were given a treatment by using word square game in teaching vocabulary process. For treatment, the researcher gave drill about hobbies through game where the game was word square game in teaching vocabulary process.

This research is intended to investigate the effectiveness of using word square game towards the students' mastery of vocabulary of the first grade at SMPN 2 SUMBERGEMPOL, in academic year 2015/2016. By applying the treatment, it is expected to know whether the scores are increasing or not. So, the effectiveness of word square game knows by the writer by the writer after get score both pretest and posttest.

B. Population and Sample

According to Gay (1992:124) stated population is the group of interest to the researcher, the group which she or he would like the result of the study to generalizable. On other hand, population is a group of individuals who have the same characteristic (Cresswell, 2012:142). So that ways, population of this research were first grade in SMP Negeri 2 Sumbergempol, which consists of nine classes from A class until I classes.

Mean while, according to Cresswell (2012:142) sample is a subgroup of the target population that the researcher plans to study for generalizing about the target population. So that ways, selection of sample is very important steps in conducting a research study. Technique to take sample is sampling. According to Gay (1992:123) sampling is the process of selecting a number of individuals for a study in such a way that the individuals represent the larger group from which they were selected. This sampling has function to get information in population. This study the writer used purposive sampling technique. The researcher took one class of nine classes from the first grade of SMP Negeri 2 Sumbergempol.

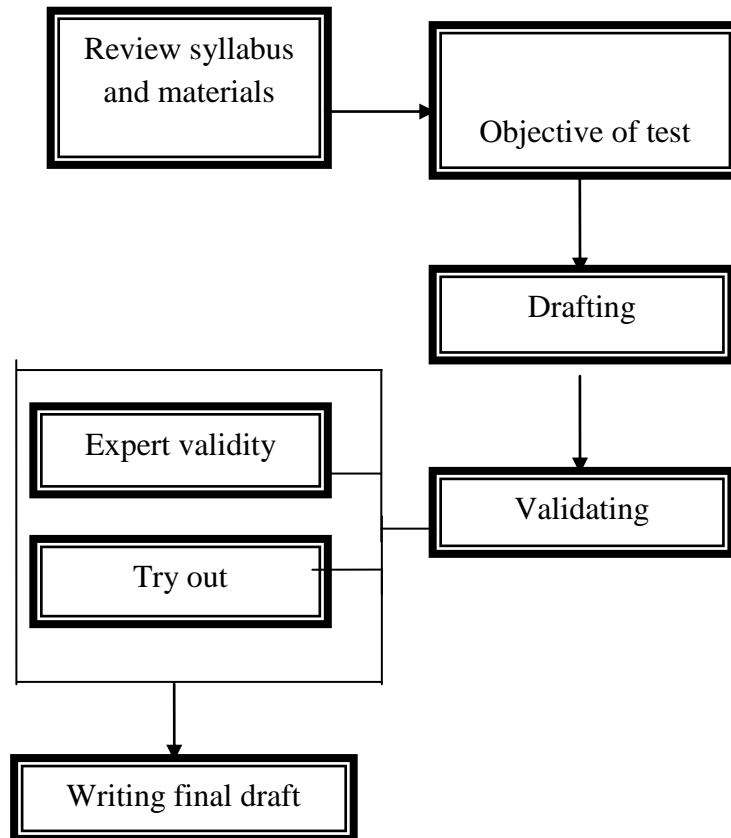
According analysis above, the researcher used the first grade students at SMP Negeri 2 Sumbergempol as population and A class students who consisted of 26 students as sample based on the selection of random sampling. The researcher takes A samples, because A class is the best class.

C. Research instrument

Instrument is the tool of the method which used in this research. The main instrument of this research was test. Test focused in testing vocabulary. According to Gay (1992:154), test is a means of measuring the knowledge, skill, feeling, intelligence, or aptitude of an individual or group. Therefore, test produces numerical scores that can be used to evaluate the test takers. To obtain the required scores of the students' achievement in vocabulary ability in this research, the researcher used two kinds of tests. They were pretest and posttest.

The first, pretest was done before treatment process (teaching vocabulary by using word square). This test is to know the basic competence and earlier knowledge before they get treatment. The numbers of the test given were 40 questions. This question was made by the researcher related to the topic. The question is consist of 15 question is fill in the blank, 10 question matching the word and 15 question is random word. The pretest was administering on 15 February 2016.

The second was posttest. The post test was done after the treatment process (teaching vocabulary by using word square). The number of the test given were 40 question related to the topic. This test was done to know the final score and to know the students' difference competence before and after they getting the treatment. The treatment was given in five meeting in the class. In the treatment, the researcher gave random words in the final of every meeting. The posttest was administered on 24 February 2015.

Table 3.1 Instrumentation

The instruction in the test were stated clearly that the students had to find, this test was consist fill in the blank. Matching the picture and circle the word randomly in the square vertically, horizontally and diagonally which was consider as the correct word or good arranging and then students write the answer in the box bellow. The total of the test is 30 questions. The time allocated was 80 minutes with 60 minutes to discuss related to the topic and 20 minutes to practice this game. To discuss related the material needed long time, because the researcher must explain the topic and in the first treatment the researcher must explain about word square game to the students. On other side, the practice of the

game needed short time, because it just to know the students understand about the material was given. The steps of instrumentation:

1.1 Review Syllabus and material

The researcher used material related to the syllabus. Before, the researcher does the research, the researcher ask the material to the teacher. The teacher gives material about hobby. Before the researcher is doing the research. The researcher give the test to students is to know the vocabulary achievement. In this material the researcher explain what is hobby and kinds of hobby. In this test, there are two kinds of test pretest and post test. Before pretest, the researcher does tryout to get the reliability of test. In this material, the researchers ask the students what is their hobby.

Table 3.2 The materials for the first grade of Junior High School

No	Topic	Objective	Learning activity	vocabulary
1.	Hobby and Interest	Students are able to mention about hobby.	Introducing vocabulary related with topic (Hobby and interest)	Swimming, cooking, dancing, fishing, camping, singing, reading, reading, writing, etc.

1.2 Objective of test

Before making a test, the researcher must know the objective of the test. It means that the test is for how and based on the learning objective in the lesson

plan. The test is to test is a means of measuring the knowledge, skill, feeling, intelligence, or aptitude of an individual or group. The learning objective is students are able to mention about hobby. So, that the test is very important in the beginning.

1.3 Drafting

In this step, drafting is very important steps because the researcher drafts all of the aspect will be input in the test. The teacher search many source to make the test. The test must suitable and based on their competence for the first grade of junior high school. The researcher take many source such as LKS mgmp Tulungagung, browsing in internet and English in focus book.

1.4 Validating

Validating is to make sure that the test is validity and reliable for the students. 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) (Cresswell, 2012:159). To measure whether the test has good validity, the researcher analyzed the test from content validity, construct validity and face validity.

In this validating, the researcher analyzed from content validity. In this content validity, the teacher makes 40 questions that consist of 15 fill in the blank. 10 matching the picture and 15 randomly word. In the construct validity, the process of validating a test of a construct is by no means an easy task. Basically, it involves testing hypotheses deduced from a theory concerning the construct. It

means that the test must be easy to understand by the student. In the face validity, the test must be clear in all aspects such as the instruction in each question, the scorer in each task and the test doesn't make ambiguity.

1.5 Expert validity

The test before the validation can be seen in appendix 1. The validation from the lecturer is from the direction is not clear. In the task 1, the type of question is wrong. It is the type of reading question. The question should fill in the blank and there are 15 questions. In each number has 3 points. In every passage should have source. Then in the task 2, the problem is direction is not clear, it makes the students is not understands. In the task 3, the problem is same with task 1. It is not vocabulary test but it is reading test. In the last task, task 4 the problem is the writer just only focused on the vocabulary test is not on the grammar test.

The next is the validation from the teacher. The teacher is agreeing about the test. She argued that the test is suitable from the teacher. Because, the test should be based on the competence and knowledge from the students. The test after the validation can be seen in appendix 2.

1.6 Try Out

Before doing the pre test, the teacher does tryout. The try out is very important to know the validity and reliability of the test. The teacher does the tryout in F class of SMPN 2 Sumbergempol, especially first grade. This tests that

consists of 40 questions. To know the reliability of tests, the researcher also used SPSS statistic. The result of the tryout is the test is reliable because the scorer is best. The scores of tryout can be seen in appendix 5

1.7 Writing final draft

In the final draft, the researcher revises the test based on all steps in instrumentation to get the reliability of test. The teacher makes 40 questions that consist 15 fill in the blanks, 10 matches the picture, 15 randomly word. For the scoring, the teacher gives points in each number. For task 1, three points in each number. For task 2, one points and task 3, three points.

D. Validity and Reliability Testing

To collect the data the researcher use instrument. The use of valid instrument is very essential to determine the validity of the data. In this research, the researcher using vocabulary test to measure the students' vocabulary achievement before and after taught by using word square game. The tests were constructed by the writer herself using some source. Before using the test, the researcher had tryout to get the reliability of the test. The researcher done the tryout for pretest and posttest was held in first grade of SMP Negeri 2 Sumbergempol, Tulungagung to 5 students to find out the validity and reliability of test.

According to Gay (1992:155), validity is that is the degree to which a test measures what it is supposed to measure. 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) (Cresswell, 2012:159). Since tests are designed for a variety of purposes and since validity can be evaluated only in terms of purpose. To measure whether the test has good validity, the researcher analyzed the test from content validity, construct validity and face validity.

a. Content Validity

Content validity is the degree to which a test measures an intended content area (Gay, 1992:156). Content validity requires both item validity where it represented measurement in the intended content area and sampling validity which was used to know how well the test samples the total content area or relevant with the purpose of the test. . Content validity is determined by expert judgment (Gay, 1992: 157). There is no formula by which it can be computed and there is no way to express it quantitatively. Usually experts in the area covered by the test are asked to assess its content validity.

A test with good content validity adequately samples the appropriate content area. So, content validity is prime importance for achievement test, because test score can not accurately reflect a student's achievement if it does not measure what the students was supposed to learn. The researcher made vocabulary test which consist of 10 fill in the blanks, 10 matches to the picture and 10 random words, search in horizontally, vertically and diagonally. The test made by the researcher based on the course objectives in the syllabus and discuss with the teacher.

b. Construct Validity

According to Gay (1992:157), construct validity is the degree to which a test measures an intended hypothetical construct. You cannot see a construct, you can only observe its effect. In fact constructs were “invented” to explain behavior, we cannot prove they exist; we cannot perform brain surgery on a person and “see” his or her intelligence. Constructs, however, do an amazingly good job of explaining certain differences between individuals.

Research studies that involve a construct either as an independent or a dependent variable are only valid to the extent that the measure of the construct involved is valid (Gay, 1992:157). The process of validating a test of a construct is by no means an easy task. Basically, it involves testing hypotheses deduced from a theory concerning the construct.

c. Face Validity

According to Gay (1992:156), face validity refers to the degree to which a test appears to measure what it purports to measure. While determining face validity is not a psychometrically sound way of estimating validity, the process is sometimes used as an initial screening procedure in test selection. Some learners were upset because such tests, on the face of it did not appear to them to test their true abilities in English. Face validity is almost always perceived in terms of content: if

the test samples the actual content of what the learner has achieved or expects to achieve, then face validity will be perceived.

Then next way to know a good test is by reliability. Reliability is a necessary characteristic of any good test for it to be valid at all and test must be reliable as measuring instruments. A reliable test is consistent and dependable.

According to Gay (1992:161), reliability is the degree to which a test consistently measures whatever it measures. An unreliable test is essentially useless; if a test is unreliable, then scores for a given sample would be expected to be different every time the test was administering. On other hand, reliability is expressed numerically, usually a coefficient; a high coefficient indicates high reliability (Gay, 1992:162). So, the test must first be reliable as a measuring instrument. Based on this research, the researcher used Cronbach's Alpha.

Table 3.3 The Result of Reliability in Try Out by using Cronbach's Alpha

Reliability Statistics

Cronbach's Alpha ^a	N of Items
-.814	40

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions.

Based on the table 3.3, it can be known that reliability of try out is 0.814. it is rounded up into 0.800. 0.80 belongs to reliable, it means that the instrument of

pretest is reliable. N of items is 40, it means that in this test consist of 40 questions. The items –total statistics can be seen in appendix 8.

The next way to know the good test is normality testing. Normality testing is needed to find out whether the data is an normal distribution or not. Therefore, the researcher intended to test the normality of the data by using SPSS 16.0 with One Sample Kolmogorov-Smirnov method. The normality testing was done towards the try out.

The hypotheses for testing normality are:

- a. H_0 : Data is in normal distribution
- b. H_a : Data is not in normal distribution

The hypotheses for normality testing say that the data is in normal distribution if H_0 is accepted and on the contrary, the data is not in normal distribution if H_a is accepted. The H_0 is rejected when the significance value is lower than 0.05 ($\alpha = 5\%$), while H_0 is accepted when the significance value is higher than 0.05 ($\alpha = 5\%$). The result analysis for normality testing can be seen in table 3.4

Table 3.4 The result of Try out in normality testing

One-Sample Kolmogorov-Smirnov Test		VAR00001
N		26
Normal Parameters ^a	Mean	75.8846
	Std. Deviation	6.91854
Most Extreme Differences	Absolute	.128
	Positive	.128
	Negative	-.061
Kolmogorov-Smirnov Z		.652
Asymp. Sig. (2-tailed)		.789
a. Test distribution is Normal.		

Based on the result above from SPSS 16.0 is know that the significance value from post test is 0.05 (see table above) it means that H_0 is accepted and H_a rejected and the data of the test is normal distribution. In this case, the significance value of tryout is 0.789 and it is higher than 0.05 ($0.789 > 0.05$). It means that H_0 is accepted and H_a is rejected. So, the test was used in this research have normal distribution and can be used in this research.

E Data Collecting Method

Data collection method is the way to get the data. In this research, the data collecting method is administering test that consist of pretest and posttest. The procedure of administering test was clarified as follows:

1. Pre-test

At the first meeting, the writer gave a pre test to the students. There are 40 questions and have done in 80 minutes. In this test consist of 15 fill in the blank, 10 matches to the picture and 15 randomly word. For the scoring in task 1, the teacher gives three points in each number. In task 2, the teacher gives one points in each number and in task 3, the teacher gives three points in each number. So, if the all student's answer corrects, the students will get the score 100. It was conducted to know the scores of the student's vocabulary achievement before taught the treatment. The pre test was administered on 15 February 2016.

2. Post-test

The post test is given to the student after conducting the treatment of using word square game. In this post test, the teacher gave the students 40 questions and has done in 80 minutes. The kinds of test are 15 fill in the blank, 10 matches to the picture and 15 randomly word. Post test was used to know ability's students after getting treatment. Then, the result of test would be compared between pretest and post test score whether differences or not. If there any differences score, it showed that treatment was successful and if there was no differences score, it showed that treatment was successful. The post test was administered on 24 February 2016.

Table 3.5 The Schedule Test and Treatment

No	Activity	Date
1.	Pretest	February 15, 2016
2.	Treatment	February 16, 2016 February 17, 2016 February 22, 2016 February 23, 2016
3.	Posttest	February 24, 2016

F. Data Analysis

In analyzing and managing quantitative data, the researcher used quantitative data by using statistical program. The quantitative data analysis was used to know the students achievement in vocabulary after using word square

game. The researcher conducted test to the students before and after they were taught by using word square game.

Data that was the students' scores obtained from the pretest and posttest would be analyzed statistically using the paired t-test. The samples were referred to as paired samples or dependent samples, because they were drawn dependently from population within one group. This program used the t-test formula, because the sample of this research was small and below 30. In this research, the first grade at SMP Negeri 2 Sumbergempol, especially A class was taken as samples, which were 26 students. The test results were compared.

T-test was taken from the students' test result which was conducted before and after the students being taught by using word square game in the process of teaching and learning vocabulary. By using the paired t-test through SPSS program, the researcher wants to know any significant differences in the one group pretest and post test as the effect of the treatment. The analysis of the data would use SPSS program with the following steps:

1. The researcher opened the SPSS program
2. Then, the researcher computed the mean of the data with got into the pretest and post test to be analysis through compared means with chosen paired-samples t-test.
3. The data got again into paired variables columns
4. The researcher would choose option to decide confidence interval percentage 95%
5. After that click "OK" to get the result.

6. Before finishing, the researcher looked up the degrees of freedom. The number of degrees of freedom (df) was the number of observations free to vary around a constant parameter. According Ary, et, al (2010:177) is:

$$df = N-1$$

Where:

df : degrees of freedom

N : number of pairs

7. The t value has to greater than the significant levels two tailed 5%, because this showed if this research could be accepted or rejected the null hypothesis (Ho).

In hypothesis testing, we as researcher always referred to the null hypothesis. The null hypothesis is a statistical hypothesis, because it states that there is no relationship between the variables in the population. The basic formula of null hypothesis is $H_0: \mu_1 = \mu_2$, meanwhile the alternative hypothesis is $H_0: \mu_1 \neq \mu_2$.

Where:

H_0 : The null hypothesis

μ_1 : The mean of the pretest

μ_2 : The mean of the post test

The criteria for accepting or rejecting the null hypothesis as follow: H_0 is rejected if significant value < 0.05 and H_0 is accepted if significant value > 0.05 .

In this study, the researcher provides some formula of T-test based on Arikunto (2010:311) as follows:

$$a. \text{ Find } t, t = \frac{M_x - M_y}{\sqrt{\left(\frac{\Sigma x^2 + \Sigma y^2}{N_x + N_y - 2}\right)\left(\frac{1}{N_x} + \frac{1}{N_y}\right)}}$$

Where:

M: average of gain between pre-test and post-test

N: total of subjects

x: deviation from x_2 score and x_1 score

y: deviation of the y_2 score and y_1 score