CHAPTER III

RESEARCH METHOD

This chapter delivers research design, population, sampling and sample, description of treatment, research variable, research instrument, data collection method, and data analysis technique which had been used by the researcher during the research.

A. Research Design

Research design is a set of systematic procedures or strategies to conduct research. Research design is essence to find scientific conformity to the fact. By using research design, the researcher was able to get the valid data that was in accordance to the questions and objectives of the research (Winarno, 2011: 55). This study is belonged to quantitative approach. Quantitative approach conducted in specific and representative sample. The process of the research is deductive; means the hypothesis were formulated as the concept to answer research questions. Therefore, its purpose is to test theories (Nurhayati, 2020: 10).

During the research, the researcher used Quasi-experimental research design with post-test only. Experimental research has aim to determine the significant effect of certain treatment over the others in controlled situation (Sugiyono, 2016: 72). Quasi experimental design is the development of true experimental which is difficult to be applied in some cases. The used of this design was due to the researcher realized on

limitation numbers of available participants and impossibility to randomize the participants. By using quasi-experimental, the participants were organized well in the class. This design allowed the researcher to understand the effectiveness of word search puzzle on students' vocabulary mastery. This design has sufficient to measure the effectiveness of something associated to educational improvement program, a project to certain element improvement (Muijs, 2004).

The design of this research can be drawn as follows:

$$NR \qquad X \qquad O_1$$

$$NR \qquad\qquad O_2$$

(Source: Workshop Nasional Eksperimen
Peneliti Ilmu Sosial Indonesia, 2017)

- Added with one control group over *The One-Group Posttest-Only*

- Can be applied when the treatment had been done even though pre-test had not been done yet

- The placement of the sample are organized or not random (NR)

- Two groups are not equivalent (dotted-line)

This research used Post-Test Only Nonequivalent Group Design. It meant that the researcher did not randomly assign participants to classes. It was due to the researcher did not have an authority to do randomization. However, the researcher ensured that the classes used in this research were as similar as possible by selecting both classes had similar scores on mid-

term test. The consideration of choosing the participants also took the suggestion from the English teacher there.

B. Population, Sampling, and Sample

a. Population

Population is generalization area including: object/ subject which have certain quality and characteristic determined by the researcher to be learnt so that the conclusion can be drawn (Sugiyono, 2016: 80). In simply way, it can be defined as object/ subject being learnt to get a conclusion in a research.

The population of this research was all of students at second grade of SMPN 1 Karangrejo. The school has ten second grade classes with 320 students. They are VIII-A with 34 students, VIII-B with 34 students, VIII-C with 33 students, VIII-D with 33 students, VIII-E with 30 students, VIIIF with 32 students, VIII-G with 31 students, VIII-H with 31 students , VIII-I with 31 students, and VIII-J with 31 students in academic year of 2020/2021.

b. Sampling

Sampling is a method to select sample from population. Sampling is essence process in research to gain specific subject from the whole. It was impossible if the researcher used all the population as the subject. Therefore, the researcher took sample through purposive sampling. Purposive sampling is a technique to collect sample by

considering specific purpose (Sugiyono, 2016: 85). This sampling was taken due to the researcher could not use all eight grade classes but wanted to choose sample with characteristic needed in the research. The researcher considered the homogeneous sample, in this case are classes with average proficiency in mastering vocabulary, they are class VIII-C and VIII-D. In taking this consideration, the researcher asked the English teacher of eight grade of SMPN 1 Karangrejo, Mr. Baedowi whether which classes fulfilled the requirement. Besides that, the researcher looked at the mid-term score of all classes then compared the average score of them. The student's mid term test is delivered in appendic XIII.

c. **Sample**

Sample is small group taken from target population. Sample was taken by the researcher due to the limitation time, energy, and authority among the population. The sample gained through purposive sampling and the sample had to represents the population or to be representative (Ary, 2010: 156). The researcher chose 66 samples that were divided as two intact groups. They are VIII-C with 33 students as experimental group and VIII-D with 33 students as control group. Control group is the participants that were treated with usual method used by the English teacher in SMPN 1 Karangrejo during online learning. The researcher did not give word search puzzle on this class. Meanwhile, the experimental group is participants who were given

treatment with independent variable or in this case by using word search puzzle.

To consider to take the two class was based some criterions. First, the class should be normal or on average level. Second, the classes must be equal. To prove the equality between VIII-C and VIII-D, the researcher looked at the mid term score to compare mean score between both classes by using Independent sample T-test. The result shows that in experimental and control class, Sig/P value is 0.410. it means that there is no significant different score in students' mid-term score between experimental class and control class. In the other words, VIII-C and VIII-D are equal. The SPSS result isshown in appendic XIII.

Meanwhile, to show the population and the sample used in this research, it can be seen in figure 3.1 below:

Figure 3.1
Population and Sample
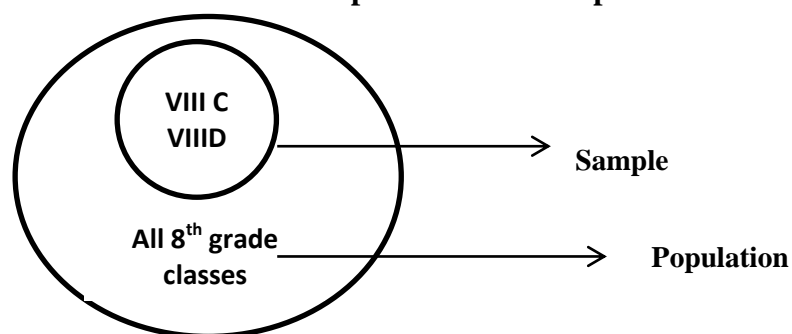
C.   **Research Variable**

Variable is what researcher determine to be learnt in the research so that the conclusion is gained. In this study, there are two variables. They are:

a.   **Independent Variable**

Independent variable gives influence to another variable. This variable affects or becomes the cause of the change for dependent variable. In this research, the independent variable is teaching vocabulary by using word search puzzle because it affected the students' vocabulary mastery.

b.   **Dependent Variable**

Dependent Variable is variable which being affected by independent variable. Student's vocabulary mastery is the dependent variable in this study since it was affected by word search puzzle.

D.   **Research Instrument**

Based on Sugiyono (2016: 102), instrument is a tool to measure the value of variable which has been researched. Thus, in quantitative research, instrument is considered as the soul of the research. The quality of the data gained in quantitative research depends on the quality of the instrument. In this research, the researcher used test as the instrument. A test is a method to measure an individual's ability, knowledge, or

performance. It means that the test was a tool to know student's general or specific competence that provided an accurate measure of the test-taker ability within a particular domain (Brown, 2004).

In this research, the researcher used objective test in the form of multiple-choices to test students' vocabulary mastery. Multiple-choice is a test that the test-taker chooses response item from a set of responses instead of creating it. In this study, the researcher gained the data from administering one kind of test through google form. Post-test was administered for both experimental class (VIII-C) and control class (VIII-D) after the treatment was completely given in order to measure the significant different score of vocabulary mastery between those who been taught by word search puzzle and those who been taught by conventional method at eighth grade in SMPN 1 Karangrejo.

The specification of the instrument for post-test before validity, reliability and level of difficulty check:

Table 3.1
The Items of Post-test before Validity, Reliability, Level of
Difficulty Check

Word	Distribution	Total
Meaning	2,9,11,12,15,18,19,22,25,26,28,30	12
Formation	3,4,7,10,13,16,21,24,29	9
Use	1,5,6,8,14,17,20,23,26,27	9

From the table above, we can see that there are three types of vocabulary knowledges. They are word form, meaning, and use. The total of items in post-test before validity and level of difficulty check was 30 items. The word or vocabulary meaning consisted of 12 numbers. They are number 2, 12, 18, 22, 26, 28, 30 for even number and 9, 11,15,19,25 for odd number. The word or vocabulary formation consists of 9 numbers. They are number 4,10,16,24 for even number and 3, 7,13,21,29 for odd number. Furthermore, the word or vocabulary use consists of 9 numbers. They are number 6, 8,14,20,26 for even number and 1, 5,17,23,27 for odd number.

After conducting validity of test, reliability, and item difficulty, there are some items which must be deleted or fixed. The validity, reliability, and item difficulty checkment are described as follows:

a) **Face Validity**

According to Ary et al (2010) who states that face validity refers to the extent to which examines believe the instrument is measuring what it is supposed to measure. In this study, the researcher used multiple choices to measure vocabulary mastery. Based on Brown (2004: 194), the technique that might to be used to test reading skills are multiple choice, picture-cued items, gap-filling tasks, C-Test, etc.

b) **Construct Validity**

Construct validity based on Ary (2010: 231) rely to what extent the instrument represents the theory behind psychological construct being measured. It evaluates whether a test really reflects what is supposed to measure. Thus, the researcher tried to find theory related to vocabulary testing technique.

Based on Heaton (1998), there are some ways to test students'vocabulary, such as matching item, multiple choice, and completion items. Since this research has focus on student's vocabulary mastery, the researcher used multiple choices as the technique used in post-test. Therefore, the instrument can be said fulfill the construct validity.

Besides consider the suitable technique, the researcher also used judgment expert to decide whether the instrument is able to be applied without revision, able to be applied with revision, or must be revised totally. The researcher consulted the test to Dr. Dwi Astuti Wahyu Nurhanyati, S.S., M.Pd. as the lecture of English Department of IAIN Tulungagung and the advisor of this research. From the consultation, the researcher needed to fix some questions. They are question number 10 must be added with article "the" before superlative form, number 12 and 27 had to use "to be" which fulfill grammatical rules, number 16, 21, 24, 25, 29 were better if researcher added word "letter" on "the right arrangement is….", and

the last is number 19, the researcher needed to change the question because it was confusing. In conclusion, instrument of post-test is able to be applied but with revision.

Besides that, the researcher also asked the teacher of English lesson at SMPN 1 Karangrejo to give judgment of the instrument. He was Mr. Ahmad Baedowi, S.Pd. From him, the researcher got advice to only fix picture for number 6 because it was unsuitable. In conclusion, the instrument is able to be applied but with some revisions. By having the expert opinion, the researcher would be able to consider whether the test is valid enough to be tried out.

Furthermore, the researcher also analyzed the validity coefficient. It was coefficient of correlation between test scores and criterion. The closer the coefficient was to 1.00, the stronger was the test used for the stated objective (Ary, 2010: 230). Based on the result, all the items are strong valid. The result of validity coefficient using SPSS can be seen in appendix IV.

c)   **Content Validity**

Content validity of the test shows relevancy between the tests with the main objectives to be measured. Ary et al., (2010: 225) states that validity is teacher examination and judgment towards the test to measure whether the test is equal sample of the content and objective to be measured or not. The test is called to have content

validity if it was able to relay a representative sample of language skills, structures, etc., being examined.

In this study, the researcher ensured that the instrument would fulfill the content validity requirement. Therefore, the researacher checked the relevancy between the instruments specification with the curriculum used at SMPN 1 Karangrejo for the second grade in the second semester in academic year 2020/2021. It is important because the instrument must reflect what students need to learn in accordance with the objective of the curriculum used in the school. The test specification of instrument for try out can be seen in appendic II and the test item for try-out is in appendic III

d) Reliability Testing

Before applying post-test, the researcher verified the reliability of the instrument. Based on Sugiyono (2016: 121), reliable instrument give consistence result although being used to measure the same object for several times. In this research, the reliability of the test was examined through conducting try-out. The try out was assigned in the second week for class E which has similar level of ability with experimental and control class.

The decision to select this class was based on the consultation to the English teacher. Because of the limitation time and the authority of the researcher, to know the internal consistency of test

items, the researcher tested the instrument once. Then, the data gained would be analyzed with split-half technique Spearman Brown through statistical computation SPSS 24.0. According to Ary (2010: 243), split half can be done by dividing the items of test into two halves, gain the scores for each individual into two halves, then compute the coefficient of correlation.

It is important to ensure that the two splitted test items are equal. Therefore, the researcher divided the items to be 15 for odd numbers and 15 for even numbers. The researcher also analyzed the level of difficulty of both halves items.

To consider the test was reliable or not, the researcher used this criterion (Sarwono, 2015: 249):

1. If correlation of Guttman Split-Half Coefficient $\geq$ 0.80, the instrument is RELIABLE

2. If correlation of Guttman Split-Half Coefficient $\leq$ 0.80, the instrument is NOT RELIABLE

   The result of reliability testing by using SPSS.24.0 can be seen in the table below:

Table 3.2
The Result of Reliability Post-test

Reliability Statistics			
Cronbach's Alpha	Part 1	Value	.875
		N of Items	15[a]
	Part 2	Value	.847
		N of Items	15[b]
	Total N of Items		30
Correlation Between Forms			.776
Spearman-Brown Coefficient	Equal Length		.874
	Unequal Length		.874
Guttman Split-Half Coefficient			.871

Based on the statistical calculation above, the researcher looked at the result of The Guttman Split-Half Coefficient column and compared it to the criteria based on Sarwono to make conclusion whether the test items was reliable or not. The The Guttman Split-Half Coefficient score of the instrument is 0.871 which means it is RELIABLE. Thus, the instrument can be tested as post-test for this research.

e) Level of Difficulty

The instrument used to measure the vocabulary mastery of the students must be considered neither too easy nor difficult. According to Arikunto (2009: 245), the item of the test is accepted it level of difficulty around 0.30-0.70. It can be seen by calculating each item with formula (p.208):

$$P = \frac{B}{JS}$$

In which:

P   : Index of difficulty

B   : The number of correct answer

JS   : The number of students

If the index of difficulty is lower than 0.30, the item is considered as too hard, yet if the result is upper than 0.70, the item is beloged too easy.

The result of item difficulty can be seen in the table below:

Table 3.3
Level of Difficulty each Item

No item	P	No item	P	No item	P
1	0.63	6	0.93	11	0.47
2	0.60	7	0.70	12	0.63
3	0.87	8	0.67	13	0.67
4	0.67	9	0.63	14	0.67
5	0.47	10	0.50	15	0.60

No item	P	No item	P	No item	P
16	0.67	21	0.67	26	0.63
17	0.67	22	0.67	27	0.50
18	0.77	23	0.73	28	0.97
19	0.57	24	0.53	29	0.53
20	0.60	25	0.63	30	0.63

From the table above, the researcher could conclude that there were five numbers which considered as too easy items. They were number 3, 6, 18, 23, 28. However, instead of fixing them, the researcher deleted the items.

After ensuring validity, reliability, and level of difficulty, the researcher did revision to the instrument. In addition, she decided to eliminate ten numbers of items also as the suggestion. The specification of post-test after revision can be seen in the table below:

Table3. 4
**The Items of Post-test after Validity, Reliability, Level of Difficulty Check**

Word	Distribution	Total
Meaning	2,9,11,12,15,22,26	7
Formation	4,10,13,16,21,24,29	7
Use	1,5,8,14,17, 27	6

E.   Procedures of the Research

In this study, the researcher administered four times online meeting including post-test for two classes. The meetings were administered to VIII-C as experimental class and VIII-D as the control class. Both classes were given the same material through online class but with different method. The experimental class was given treatment by using word search puzzle game. Meanwhile, the control class was only be taught by using conventional method or a method which usually used by the English teacher at SMPN 1 Karangrejo during online class. In the second meeting, the researcher conducted try-out for class E which has similar level of ability with experimental and control class.

The test item for try-out was the same with the test item for post-test but in different total numbers. This try-out was to measure the reliability and validity of the instrument before being applied as post-test. After ensuring that the instrument is valid and reliable enough, the researcher conducted post-test in the fourth meeting. To know the procedures of the research, it can be seen in the chart below:

Figure 3.2
Procedures of the Research
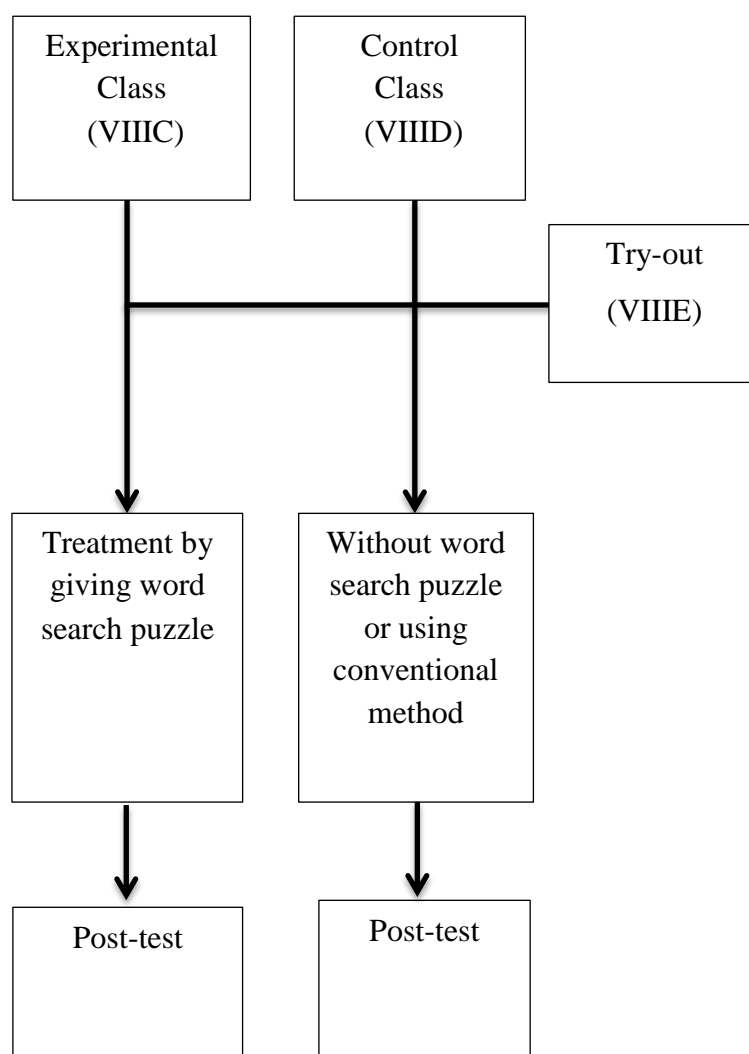
To know the schedule of the research, it can be seen on the table below:

Table 3.5
The Schedule of the Research

No.	Group	Meeting	Date	Activity
1.	Experimental (VIII C)	I	Saturday, January 9th, 2021	Treatment 1 by word search puzzle
2.	Control (VIII D)			Teaching by conventional method
3.	Experimental (VIII C)	II	Saturday, January 16th, 2021	Treatment 2 by word search puzzle
4.	Control (VIII D)			Teaching 2 by conventional method
5.	Experimental (VIII C)	III	Saturday, January 23rd, 2021	Treatment 3 by word search puzzle
6.	Control (VIII D)			Teaching 3 by conventional method
7.	Experimental (VIII C)	IV	Saturday, January 30th, 2021	Treatment 4 by word search puzzle and conducting post-test
8.	Control (VIII D)			Teaching 4 by conventional method and conducting post-test

1. **First treatment of word search puzzle was conducted on January 9th, 2021**

After giving the explanation about the first material about positive degree, the researcher conducted the treatment. To begin the treatment by using word search puzzle, the researcher gave some introduction about this media to the students. The researcher explained how to run word search puzzle mini game through website which had been sent. After checking the understanding of the students, the researcher asked them to play word search puzzle. After that, the students were given by an exercise. The answers of the exercise could be found through word search puzzle. Finally, the students collected the exercise along with the puzzle they had been completed.

2. **Second treatment of word search puzzle was conducted on January 16th, 2021**

After giving the explanation of the second material about comparative degree, the researcher gave the treatment by using word search puzzle to the students. The given treatment was the same with the first meeting. They played the word search puzzle online through link which had been sent. After that, they needed to answer the exercise where the answer could be found through the puzzle. Finally, they had to collect it to the researcher via whatsApp to get the feedback.

3. **Third treatment word search puzzle was conducted on January 23ʳᵈ, 2021**

In the third meeting, the researcher explained about superlative degree. After explaining, the researcher sent link of word search puzzle to the students in WhatsApp group. The treatment was similar with the second treatment. The students worked in the puzzle and continued to do exercise. The researcher told that the students could find the answer through the puzzle so that they neede to pay more attention to the game. Finally, they collected the exercise along with the puzzle.

4. **Fourth treatment word search puzzle and post-test were conducted on January 30ᵗʰ, 2021**

In this meeting the researcher reviewed material of three meeting. After that, the researcher gave treatment by using word search puzzle to the students. The students tried to find the words individually just like the three previous meetings. After they collected the done puzzle, the students were given post-test through google form. After finishing the post-test, students sent their answers through google form.

F. **Data Collecting Method**

Data collecting method is the way the researcher to collect the data. Researcher used one kind of tests and four treatments.

a. Treatment

The treatments were conducted four times. The treatment by applying word search puzzle was only given to experimental class (VIII-C). The

aim of the treatment was to help student mastery more vocabulary form, meaning, and use related with degrees of comparison with the help of word search puzzle in online class.

b. Post-test

After the treatment had been completely conducted, the researcher administered post-test to the students. Post test was administered to experimental and control class. The number of test items was 20 included questions to know students' understanding in vocabulary form, meaning, and use.

G.   Data Analysis

The data gained from this research was analyzed to know the effectiveness of using word search puzzle toward students' vocabulary mastery. There were two row scores from administering post-test to both experimental and control class. Before the scores were analyzed statistically by using SPSS 24.0, the result of the test done by students was divided into score in vocabulary form, vocabulary meaning, and vocabulary use.   To know the significant different score between experimental and control class, it was important to find out whether the data had been distributed normally and whether there was any difference variance in the two groups above. The normality and homogeneous testing is a requirement before doing hypothesis testing by using Independent Sample T-test. In hence, the researcher conducted normality and homogeneity testing as follows:

1. Normality Testing

    Normality found when the data can be distributed in normal way. To test the normality of the data, the researher used *Kolmogorv-smirnove test* through *SPSS.24.0* which could be used for a test in a large sample.To consider whether the data was normal or not, it was needed and indicator. The indicator is shown in chapter IV.

2. Homogeneity Testing

    Homogeneity is to make sure the data gained from different characteristic population. To know the homogeneity, the researcher used T-test of Homogeneity of Variances with SPSS.24.0.

    After ensuring the data had fullfiled normality and homogeneity, the researcher used t-test to know the significant value is higher or smaller than α (0.05). If the significant value less than α (0.05), H_0 would be rejected and H_a would be accepted. In contrast, if the significant value more than α (0.05), H_0 would be accepted and H_a would be rejected.