CHAPTER III

RESEARCH METHOD

In this chapter, the researcher presents about design and data that need for complete this research. This chapter consists of (a) research design, (b) population, sample and sampling, (c) research instrument, (d) validity and reliability testing, (e) normality testing, (f) data collecting method, and (g) data analysis.

A. Research Design

Researcher needs thing that help her to guide, so research carried out appropriate with her planning. According to Balnaves and Caputi (2001: 29) research design is the guide to how the research was constructed and carried out. So that, in this section explains how the research constructed.

Research is defined as a study to find the new fact. Researcher tried to research how the game is effective for students. In this study, the researcher uses experimental research. The experimental method is the only method of research that can be truly test hypothesis concerning cause-and effect relationships (L.R. Gay 1992: 298). Grounded the hypothesis, the researcher show the evidence how the technique is effective for students and it cannot be apart from previous studies. This research was to know the effectiveness of Chinese Whispers game toward students' vocabulary mastery of seventh grade at SMPN Sumbergempol 2 Tulungagung.

Variable is everything that to be learned the researcher so get the information from that, then the researcher get the conclusion. A variable is a general class of objects, events, situations, characteristics and attributes that are of interest to the researcher (Balnaves and Caputi, 2001: 46). This research conducted an experimental teaching using game. It had two variables, they are:

1. Independent variable in this research is the researcher use Chinese Whisper game toward students' vocabulary mastery.

2. Dependent variable in this research is students' achievement of seventh grade at SMPN Sumbergempol 2 Tulungagung indicate their understanding on vocabulary.

An experimental research design involve three classifications, there are pre-experimental, quasi-experimental and true-experimental. This research chooses pre-experimental for one group which are pre-test and post-test. Time for gets the scores to compare the game is effective or not conduct in two times are pre-test and post-test. Pre-test carried out before giving treatment and post-test after giving treatment.

The procedures of experimental research that use One-Group Pretest-Posttest design :

1. Administering a pre-test before applying technique with a purpose of measuring vocabulary mastery of seventh grade students at SMPN 2 Sumbergempol Tulungagung.

2. Applying the experimental students' vocabulary mastery by using Chinese Whispers game as a technique to the subjects (seventh grade students at SMPN Sumbergempol 2 Tulungagung).

3. Administering a post-test after applying technique with a purpose of measuring vocabulary mastery of seventh grade students at SMPN 2 Sumbergempol Tulungagung.

That is based on the diagram below:

Table 3.1. Diagram of One Group Pre-test and Post-test design:

Y1	X	Y1
Pre-test	Treatment (Independent variable)	Post-test (Dependent variable)

At the end of the research, the researcher concluded the effectiveness of Chinese Whispers game in teaching vocabulary by using pre-experimental design by comparing pretest and posttest results of B class. The effectiveness is known through differentiate score between pre-test and post-test, if the post-test score higher than pre-test score the technique is effective.

B. Population, Sample and Sampling

Population is all of subject in research that before founding from the interesting researcher in area that occupy the subject. Arikunto (2013: 173) in Encyclopedia of Educational Evaluation said that a population is a set (or collection) of all elements processing one or more attributes of interest. The all of subject that stay in occupy of research that is population. The populations of this

research were all of seventh grade at SMPN 2 Sumbergempol Tulungagung, there were eight classes, class A-F.

In research, all of subject is called population but some of the subject that needed the researcher it is called sample. Sample is part or representative of population that will be research (Arikunto, 2013: 174). Sampling is technique to select the sample which represents the population. This research took one class of eight classes which used purposive sampling technique. The researcher took VII B as the sample of seventh grade SMPN 2 Sumbergempol. The researcher took this class because suggestion from the teacher after interview. The teacher suggestion Chinese Whispers game is appropriate in seventh grade. She also said that this class was potential to be applied the treatment, it means that this class was homogen or it can called most of them have average ability. In class B there were 26 students consists of 15 boys and 11 girls.

C. Research Instrument

Instrument is a tool that is used in a research. The main instrument of this research was test. Test that is used in this research focused in teaching vocabulary for junior high school that appropriate with the curriculum.

To know the student's ability, the researcher need test. According to Gay (1992: 154) test is a means of measuring the knowledge, skill, feeling, intelegence, or aptitude of an individual or group. Therefore, test produces numerical score that get from the student and it will be as representative how much student understand the materials received from teacher.

The researcher used two kinds of instrument, they were pre-test and post-test. The aim to do test is to know Chinese Whispers game is effective or not for the students to learn vocabulary. The material of the test will be taken from English book and other resources to add more vocabularies which related to their subject and based on Junior High School curriculum.

Pre-test was arranged before the students were taught by Chinese Whispers game or before giving treatment. Pre-test is given to know how far the students' ability in vocabulary test before accepts Chinese Whispers game or treatment. The kinds of test are Multiple Choice-test and Matching Test, test includes 25 questions. Multiple Choice-test involves 15 questions and Matching test involves 10 questions.

Post-test was arranged after the students were taught by Chinese Whispers game after giving treatment. Post-test is given to know the achievement or competence the students' after given treatment. The kinds of test were same with pre-test. It is done to know the difference the score of pre-test and post-test. If the post-test score is high than pre-test, the technique or Chinese Whispers game is effective to teaching vocabulary.

The scoring of the test is the researcher counting the right answer of students' answer. To know the student's score follow as formula:

Table 3.2. The formula of score result.

Score = Σcorrect answer X 4

D. Validity and Reliability Testing

In quantitative research is always depends on measuring instrument that used in research, to measure the instrument through two concepts that must understand when the researcher measuring test. They are validity and reliability.

1. Validity

A test called valid when the test was appropriate with the items that used in learning process. Ary, Jacobes and Sorensen (2010: 224-225) states that validity is the most important consideration in developing and evaluating measuring instruments.

Validity is defined as extent to which scores on a test enable to make meaningful and appropriate interpretations. According to Gay (1992: 154) validity is totally indispensible; there is no quality or virtue of the test that can compensate for inadequate validity. There are four different types of validity; they are content, construct, concurrent; and predictive. This research measure test to be a good validity by analyzed the test from content validity and construct validity.

a. Content validity is test that only representative or not all subjek to be measure. Test content must be seen by the expert that can be covered of all subjects in content area. Gay (1992: 156-157) stated that content validity is the degree to which a test measures an intended content area. A test with good content validity adequately samples the appropriate content area. Content validity is determined by expert judgment. Usually experts in the area covered by the test are asked to assess its content validity. So, content validity is appropriate with the instrument that used the researcher because it correspondence between curriculum

objectives and objectives being assessed. The instrument of this research use design by SK-KD in KTSP 2006.

b. Construct validity is testing that done to measure the behavior of students. Gay (1992: 157) states that 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. So, we cannot measure achievement student scores, their intelligence, etc, but their ability or effect after we give the treatment. In this study the researcher use two kinds of formula in vocabulary test. It is for multiple choice test and matching test. The multiple choice test is involves choose the correct answer from a, b, c, d vocabulary answer that have to ready the researcher. Meanwhile matching test, students asked to choose the correct answer to complete the statement by the vocabularies in a box. Both of them are appropriate for testing vocabulary.

2. Reliability

To make the test consistent and dependable, the researcher needs a reliable test. Ary, Jacobes and Sorensen (2010: 224-225) states that reliability indicates how consistently a test measures whatever it does measure.

The researcher used KR-20 formula to measure the try out test to be reliable and valid, most of researcher used this formula because not crucial and requires test administration only once. The calculation used this formula can

looked on table 3.6 and the results known on page 37. The KR-20 formula by

Fraenkel and Wallen (2005: 156) follows the below:

Table 3.3. KR-20 formula

$$r11 = \left[\frac{n}{n-1}\right]\left[\frac{s_t^2 - \sum p1 - q1}{s_t^2}\right]$$

where,

r11 = reliability coefficient

n = number of test items

S_t^2 = standard deviation

p1 = the right response

q1 = the wrong response

After calculating the realibility of the test items, the researcher classified

the reliability coefficient which taken from Sudjiono (1996: 209-230), as the

follows:

Table 3.4. Classification of Reliability Test

Reliability Test Coefficient	Classification
0.99-1.00	More highly
0.70-0.89	High
0.50-0.69	Fair
0.30-0.49	Low
<0.30	Very low

The researcher applied the formula above based on try out of VII F at

SMPN 2 Sumbergempol on the table below:

Table 3.5. The Preparatory to Compute the Standard Deviation

No.	Name	X_t	X_{t2}
1	ADK	18	324
2	AP	22	484
3	ARN	19	361
4	ATA	21	441
5	APDP	19	361
6	A	18	324
7	DZO	20	400
8	KK	21	441
9	LM	19	361
10	LDK	19	361
11	MR	16	256
12	MFNA	18	324
13	MDS	22	484
14	MRI	20	400
15	MFRB	18	324
16	RK	17	289
17	RZM	22	484
18	RAS	19	361
19	RKZ	21	441
20	SD	19	361
21	SIL	22	484
22	SAL	23	529
23	TWS	22	484
24	VIN	20	400
25	YTW	17	289
26	ZM	21	441
		$\Sigma X_t = 513$	$\Sigma X_t^2 = 10.209$

$$S_t^2 = \frac{\Sigma t^2}{N}$$

To know ΣXt^2 the formula result as the follows:

$$\Sigma Xt^2 = \Sigma Xt^2 - \left(\frac{\Sigma Xt}{N}\right)^2$$

$$= 10.209 - \left(\frac{513}{26}\right)^2$$

$$= 10.209 - 389,30$$

$$= 9.819,7$$

Therefore, the standard deviation is

$$\sqrt{St^2} = \sqrt{\frac{9.819,7}{26}} = 19,43$$

After finding the result of standard deviation, the reliability can be computed by

using Kuder Richardson formula (KR-20).

**Table 3.6. Compute the Reliability by using Kuder Richardson Formula
(KR-20)**

Item	Np	P_1	Nq	Q_1	P_1Q_1
1	20	0,76923	6	0,23076	0,17750
2	21	0,80769	5	0,19230	0,15531
3	19	0,73076	7	0,26923	0,19703
4	22	0,84615	4	0,15384	0,13017
5	17	0,65384	9	0,34615	0,22632
6	21	0,80769	5	0,19230	0,15531
7	20	0,76923	6	0,23076	0,17750
8	21	0,80769	5	0,19230	0,15531
9	21	0,80769	5	0,19230	0,15531
10	22	0,84615	4	0,03846	0,13017
11	22	0,84615	4	0,15384	0,13017
12	12	0,46153	14	0,53846	0,24851
13	23	0,88461	3	0,11538	0,10206
14	22	0,84615	4	0,03846	0,13017
15	13	0,5	13	0,5	0,25
16	23	0,88461	3	0,11538	0,10206
17	22	0,84615	4	0,03846	0,13017
18	22	0,84615	4	0,03846	0,13017
19	23	0,88461	3	0,11538	0,10206
20	23	0,88461	3	0,11538	0,10206
21	24	0,92307	2	0,07692	0,71002
22	21	0,80769	5	0,19230	0,15531
23	22	0,84615	4	0,15384	0,13017
24	21	0,80769	5	0,19230	0,15531
25	21	0,80769	5	0,19230	0,15531
					$\Sigma P_1Q_1=$ 4,39348

Therefore, the reliability is:

$$r_{11} = \left[\frac{n}{n-1}\right] \left[\frac{St^2 - \Sigma P1Q1}{St^2}\right]$$

$$= \left[\frac{25}{25-1}\right] \left[\frac{19{,}43 - 4{,}39348}{19{,}43}\right]$$

$$= \left[\frac{25}{24}\right] \left[\frac{15{,}03652}{19{,}43}\right]$$

$$= [1{,}04166667] \, [0{,}77388163]$$

$$= 0{,}8061267$$

The result above shows that the test was reliable with reliability coefficient of 0.80 or 80%, it means that the reliability of test is high.

E. Normality Testing

The purpose of normality testing is to know the data that used is normal distribution or not. The data was normal distribution used as the representative of population, so why it is important for researcher to get the data. In this research, the researcher used One Sample Kolmogrov-Smirnov Test as the methods of normality testing. The normality testing was done toward posttest score. The data were presented on the table below:

Table 3.7 Students' Score to Test Normality

No.	Name	Try out (post-test)
1.	ADK	72
2.	AP	88
3.	ARN	76
4.	ATA	84
5.	APDP	76
6.	A	72
7.	DZO	80
8.	KK	84
9.	LM	76

10.	LDK	76
11.	MR	64
12.	MFNA	72
13.	MDS	88
14.	MRI	80
15.	MFRB	72
16.	RK	68
17.	RZM	88
18.	RAS	76
19.	RKZ	84
20.	SD	76
21.	SIL	88
22.	SAL	92
23.	TWS	84
24.	VIN	80
25.	YTW	68
26.	ZM	84
		$\Sigma y = 2048$

The hypothesis for testing normality were:

a. H_0 : Data is not normal distribution

b. H_1 : Data is normal distribution

In testing the hypothesis, H_1 was accepted when the data in normal distribution. H_0 was rejected if significance value was lower than 0,05 (5%) while H_0 was accepted if the significance value was higher than 0,05. The analysis of data as follow:

Table 3.8 Finding Normality Testing using SPSS 16.00

One-Sample Kolmogorov-Smirnov Test

		VAR00001
N		26
Normal Parameters[a]	Mean	78.7692
	Std. Deviation	7.31195
Most Extreme Differences	Absolute	.148
	Positive	.148
	Negative	-.147
Kolmogorov-Smirnov Z		.752
Asymp. Sig. (2-tailed)		.623
a. Test distribution is Normal.		

The analysis data by SPSS 16.00 using One Sample Kolmogrov Smirnov test above was showed the normality testing. The significant value of posttest was 0,623. It means that H_1 was accepted and H_0 was rejected, so the data was normal distribution.

F. Data Collecting Method

Data collecting method is the method to obtain data. Data of this research is collected by administering test. To measure how far the ability of object, the researcher must use test (Arikunto. 2013: 266). The data in this research is students score of vocabulary test. Because this research is quantitative design, so the data are in the form of number. In order to get the good quality of data, the researcher must choose the good instrument that used in research. The instruments

of test were Multiple Choice-test and Matching test. This test give twice. The technique of collecting data was clarified as follows:

1. Pretest

Pre-test was given before the students get the treatment by using Chinese Whispers game. This test followed by 26 students and conducting 40 minutes for allocated times. The test includes multiple choice test and matching test. Multiple choice test includes 15 number and matching test includes 10 number. It was done before treatment process by using Chinese Whispers game. This test given by students is to know their basic competence before applying the treatment.

2. Treatment

The treatment was given in three circles by using Chinese Whispers game. The researcher conducted treatment in the classroom.

3. Posttest

Post-test was given after the students get the treatment by using Chinese Whispers game. This test followed by 26 students and conducting 40 minutes for allocated times. The test includes multiple choice test and matching test. Multiple choice test includes 15 number and matching test includes 10 number. It was done after treatment process by using Chinese Whispers game. The result of test to know differentiate score between pre-test and post-test is any significant or not. If there any differences score, it showed the treatment was successful but if there was no differences score, it showed the treatment was unsuccessful.

G. Data Analysis

In this research the researcher use pre-experimental in quantitative research. In this study, pre-experimental are processed by comparing the two test (pre-test and post-test). The first data is data of student score before taught using Chinese Whispers game (pre-test). The data result is after using Chinese Whispers game (post-test). If the post-test of using Chinese Whispers game's score test is higher than pre-test, it means that the technique is effective.

To get the student's ability in vocabulary mastery, the researcher is going to give the students a test after get treatment in vocabulary by using Chinese Whispers game. The test is multiple choice-test and matching test.

The researcher uses t-test formula to analyze the data, which formula is effective to know students differentiate the students giving treatment and the students not giving treatment. The formula for t-test according to Ary, Jacobes and Sorensen (2010: 171) as the following formulation:

Table 3.9. T-test formula

$$t = \frac{\bar{D}}{\sqrt{\dfrac{\Sigma_D 2 - \dfrac{(\Sigma D)^2}{N}}{N\,(N-1)}}}$$

where:

t   = t ratio (t score)

$\bar{D}$ = different scores squared, the summed

$\Sigma\, D^2$ = different scores summed then squared

N   = number of pairs (number of samples)