CHAPTER III
METHODS OF INVESTIGATION

A. Time And Place of Research

1. Time of the research

   This research was implemented on 16 August– 26 September 2014, counted since the proposal was submitted until the end of research.

2. Place of the research

   The writer conducted the research at SDIT BUQ Betengan. It is located at Jl. Betengan Kadilangu Demak.

B. Research Variable

Variable is the object of research or something that became the concern of research.[1] In this study there are two variables.

1. Independent Variable

   It is a variable that influences or causes of change or emergence of the dependent variable. Independent variable in this research is the use of Hangaroo game in teaching vocabulary or the method used in teaching and learning process.

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[1] Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik,* (Jakarta : PT Rineka Cipta, 2010), p.159

2. Dependent Variable

It is variable that is affected resulting, because of the existence of the independent variable. Dependent variable in this research is the achievement of the students of the fifth grade of SDIT BUQ Betengan Demak in vocabulary.

C. Research Method

In this study, the method used was experimental study. An experiment is the way to find the causal relationship between two factors. An experimental study typically involves two groups: an experimental group and control group which receive the different treatment. This study uses control group design pre-test-post-test.

There are two groups in pretest–posttest control group design that are chosen randomly, and then they are given pretest to know the initial condition between experimental group and control group are same. The sketch of this design can be seen as follow:[2]

R	O_1	X	O_2
R	O_3	-	O_4

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[2] Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R & D,* (Bandung: Alfabeta, 2009), p. 76

Explanation:

R   : Experimental and control groups that are chosen randomly

O_1 & O_3 : Pretest of experiment and control groups to know the initial condition of both groups are same.

O_2 : Students' achievement who had been taught by using Hangaroo Game (posttest of experiment group)

O_4 : Students' achievement who had been taught by using non Hangaroo Game (posttest of control group)

X   : Treatment (teaching vocabulary by using Hangaroo Game.

There are two groups in this model of experimental research. First is experimental group and the second is control group. The writer decided to choose class V A as the control class and class VB as the experimental class. The experimental class received a new treatment. It was taught by hangaroo game in teaching vocabulary while the control class taught by non hangaroo game. It did not receive a new treatment.

D. Subject Of The Research

1. Population

Population is all the subject of the research.[3] In this study, the population or the subjects of research are the fifth

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[3] Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R & D,* (Bandung: Alfabeta, 2009), p.215

grade students at SDIT BUQ Betengan Demak in the academic year of 2014/2015. The number of the population is 84 students. They are divided into VA, VB and VC.

2. Sample

Sample is part of population.[4] In this study, there are two classes as sample. Where class VA as the control class that consisted of 28 students and class VB as the experimental class that consisted of 28 students.

3. Sampling

Two classes were chosen randomly, in which each class consisted of 28 students. Class VA was appointed as the experimental group which was taught by hangaroo game while class VB was appointed as the control group which was taught by non hangaroo game.

E. Method of Collecting The Data

To get the accurate data, in this study the writer uses two way in the collecting the data, they are:

1. Test

Test is a set of question and exercises used to measure the achievement or capability of the individual or group.[5] This method is used to get data about score of the pre-

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[4] Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R & D*, p.215

[5] Suharsimi Arikunto, *Prosedure Penelitian Suatu Pendekatan Praktik,* (Jakarta : PT Rineka Cipta, 2010), p.193

test and post-test was given for both of groups. There are experimental class and control class. The test in this study is an essay test or subjective test in multiple choice test of reading. The test consists of 20 questions.

a. Pre- test

Before the teacher taught new material vocabulary, the teacher gave a test to the students. Pre- test were given to the experimental class and the control class. This test is given before the experimental was run.

b. Post- test

Post- test was given to the experimental class and the control class. The test was given in order to know the different of students' achievement in vocabulary. The post- test was given to the experimental class and control class after received treatment. The experimental class taught by hangaroo game in teaching vocabulary and the control class taught without using hangaroo game.

2. Observation

The data had been collected through observation. "In using observation the most effective way is to complete format or form observation as instrument."[6] The observation conducted by two people. They were Fathimatuz Zahro S.Pdi, she is English teacher at SDIT BUQ Betengan. And the

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[6] Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R & D,* (Bandung: Alfabeta, 2009), p.145.

second was researcher as the observer to fill the observation form.

F. Research Procedure

   The steps of research includes preliminary visit, contact the headmaster, ask the data about the students as participants, give pre-test, give the treatments, give the post-test, and conduct the observation. The procedures of research could be seen in the following table.

No.	Task	What to prepare	Date
1.	Preliminary visit (meet the administration officer)	-	Saturday, 16th August 2014
2.	Contact the headmaster	Research permission letter	Sunday, 17rd August 2014
3.	Contact the English teacher to ask data of students as participants	Lesson plan	Sunday, 17rd August 2014
4.	Give pre-test	Pre-test	Wednesday, 27th August 2014
5.	Give treatment	Lesson plan, observation checklist	Friday, 12nd September 2014- Wednesday, 17th September 2014
6.	Give post-test	Post-test	Friday, 26th September 2014

1. Preliminary Visit

   The researcher visited the school at Saturday, 16th August 2014 to get information about the students' subject as participants. To gain the information, the researcher asked the administration staff whether the school possibly became the setting of research or not by describing the researcher's intention and asked for information about setting and participants.

2. Contact the Headmaster

   Having got the information about setting and participant, at Sunday, 17th September 2014 the researcher did the second visit to meet the headmaster of the school by asking the permission letter.

3. Contact the English Teacher

   At 17th September 2014, after receiving research permission from the headmaster of the school, the researcher met the English teacher and asked for the data of students what the class should become the participants that were the control and experimental groups.

4. Pre-test

   In this session, the researcher gave the pre-test both experimental and control groups the same multiple choice tests . This test conducted at Friday, 27th August 2014. The test was to ensure that both two groups were the same in

score. In addition, the results or score of the test were used to determine the students.

5. Treatment

At Friday, 12nd September 2014 – Wednesday, 17th September 2014 the experimental group was given the treatment and taught by researcher as the experimenter while the control group was taught also by the researcher. Both groups teaches in same material, but was different in teaching material that was by hangaroo game and non hangaroo game. During the treatment, the observation was also conducted to observer.

6. Post-test

Having administered the treatment for secondly, the post-test was given to both groups to test their understanding on English advertisement text. The post test was given at Friday, 26th September 2014.

G. Techniques of Data Analysis

The writer analyzed the data through giving test to the students. It needs some steps in analyzing of the data. The following are the steps taken by the writer:

1. Technique of scoring test

As stated in the hypothesis in this research, the researcher wants to know whether hangaroo game more effective than teaching available on vocabulary at fifth grade students of senior high school. The researcher made esay

test, each item had one score. A certain technique to score is used, it is:

$$S = \frac{R}{N} \times 100$$

Where:

S = Score

R = Total number of correct answer

N = Total number of item

2. Pre-requisites Test

Before the writer determined the statistical analysis technique used, the first the writer examined the validity sample. The way that was used to examine the validity sample was normality and homogeneity test.

a. Normality Test

Normality test used to know the distribution data normal or not. To find out the distribution data is used normality test with Chi-square.[7] The steps of Chi-square test as follows:

1) Determine of the range (R): the largest data reduced the smallest data.

2) Determine the many class intervals (K) with the formula:

K= 1+ (3, 3) log n

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[7] Sudjana, *Metode Statistika,* (Bandung: Tarsito, 2001), p.273.

3) Determine the length of the class, using the formula:

$$p = \frac{range\ R}{number\ of\ class}$$

4) Make a frequency distribution table

5) Determine the class boundaries (bk) of each class interval.

6) Calculating of the average Xi ($\bar{x}$), with the formula:

$$\bar{X} = \frac{\sum f_i x_i}{\sum f_i}$$

7) Calculate variance, with the formula:

$$s^2 = \frac{n\sum f_i x_i^2 - (\sum f_i x_i)^2}{n(n-1)}$$

8) Calculate the value of Z, with the formula:

$$Z = \frac{x - \bar{x}}{s}$$

x = Limit class

$\bar{x}$ = Average

S = standard deviation

9) Define the board area of each class interval.

10) Calculate of the frequency expository (fh), with the formula: fh = n x wide area with the n number of sample.

11) Make a list of the frequency of observation (fo), with the frequency expository as follow:

class	Bk	Z	P	L	Ei	$\dfrac{(Oi - Ei)^2}{Ei}$

12) Calculate the Chi-square (x^2), the formula:

$$X^2 = \sum \frac{(O - Ei)^2}{Ei}$$

13) Determine the degree of validity (df). In the calculation of this data is arranged in the list of frequency distribution consisting of k pieces so that the interval to determine the criteria test used formula df = k-1, where k is the number of class intervals and the real extent α = 0.05

14) Determine the value of x^2 table.

15) Determine the distribution normality with test criteria:

If $X_{count} > X_{table}$ so the data is not normal distribution and other way if the $X_{count} < X_{table}$ so the data is normal distribution.

b. Homogeneity Test

Is used to know whether the data are homogeneous or not.

The formula is:[8]

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[8] Sudjana, *Metode Statistika*,(Bandung: Tarsito,2001), p.250

$$F = \frac{Vb}{Vk}$$

Where:

Vb: bigger variance

Vk: smaller variance

The hypothesis in homogeneity test are:

Ho: homogeny variance = $\sigma_1^2 = \sigma_2^2$

Ha: non homogeny variance = $\sigma_1^2 \neq \sigma_2^2$

If the calculation result of F_{count} is lower that

F_{table} ($F_{count} < F_{table}$) by 5% degree of significant so Ho is

accepted, it means the data is homogeneous or both of groups have the same variance.

c. Test of the Average

It is used to examine average whether experimental group and control group that has been decided having significant different average.

Ho: $\mu_1 = \mu_2$

Ha: $\mu_1 \neq \mu_2$

The formula that is used in the t-test as follows:[9]

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[9] Sudjana, *Metode Statistika*,(Bandung: Tarsito,2001), p.239

$$t = \frac{\overline{X} - \overline{X}_2}{s\sqrt{\dfrac{1}{n_1} + \dfrac{1}{n_2}}}$$

$$\text{with} \quad s = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

Where :

t : Statistic

$\overline{X1}$: The mean score of the experimental group

$\overline{X2}$: The mean score of the control group

$S_1{}^2$: The variants of experimental group

$S_2{}^2$: The variants of control group

n_1 : The total of the students of experimental group

n_2 : The total of the students of control group

     Criteria   test   is   Ho   is   accepted   if $-t_{1-\frac{1}{2}\alpha} < t < t_{1-\frac{1}{2}\alpha}$.   where $t_{1-\frac{1}{2}\alpha}$ obtained   from   the distribution list t with df $= (n_1 + n_2 - 2)$ and opportunities $(1 - \frac{1}{2}\alpha)$. Values for other t Ho rejected.

3. Analysis Phase End

     To examine the hypothesis that have been stated, these following steps are used.

a. Normality Test

Steps normality second step is the same as the normality test on the initial data.

b. Homogeneity Test

Steps homogeneity second step is the same as the homogeneity test on the initial data.

c. Hypothesis Test

Proposed hypothetical test in average similarity with the right test is as follows:

$Ho = \mu_1 = \mu_2$

$Ha = \mu_1 > \mu_2$

μ_1 : average data of experimental group

μ_2: average data of control group

The t-test formula is used.

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt[5]{\frac{1}{n_1} + \frac{1}{n_2}}}$$

With

$$s = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

Where:

t : Statistic

$\overline{X1}$: The mean score of the experimental group

$\overline{X2}$: The mean score of the control group

$S_1^{\,2}$: The variants of experimental group

$S_2{}^2$: The variants of control group

n_1 : The total of the students of experimental group

n_2 : The total of the students of control group

Testing criteria that apply Ho is accepted if $t_{count} > t_{table}$ with determinate df $= (n_1 + n_2 - 2)$ and the significant α = 5% (1- α).