

## CHAPTER III

### RESEARCH METHOD

This chapter discusses about sources of data, research design, research setting, population and sample of research, variables and indicators of research, methods of data collection, and methods of data analysis.

#### **A. Research Design**

This research is quantitative in nature, because the result of the students' achievement in pre test and post test will be expressed in the language of mathematics, evaluated consequently and also interpreted by appropriate statistical procedures. In this term, quantitative data refers to the use of T-test.

Experimental research is an attempt which conducted by the researcher to maintain control over all factors that may affect the result of an experimental. In doing this, the researcher attempts to determine or predict what may occur. An experimental research involved two classes; experimental class and control class. An experimental class will receive a new treatment while control class receives a usual treatment.

According to Nunan, "experiments are design to collect data in such a way that threats to the reliability and validity of the research are minimized."<sup>1</sup>

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<sup>1</sup> David Nunan, *Research Method In Language Learning*, (Cambridge University Press, 1992), p.47

Referring to this research, the experimental and control classes are consisting of eighth grade of SMP Hasanuddin 6 Semarang. The experimental class received a new treatment by using herringbone technique while the control class was treated by using non-herringbone technique. This study used pre-test and post-test to measure both classes' changes in the period before and after receiving a treatment.

The design of experiment could be described as follows:<sup>2</sup>  
 pattern:

E	<u>0<sub>1</sub></u>	<u>X</u>	<u>0<sub>2</sub></u>
C	0 <sub>3</sub>	Y	0 <sub>4</sub>

Where:

E = Experimental class

C = control class

0<sub>1</sub> = Pre-test for experimental class

0<sub>2</sub> = Post-test for experimental class

0<sub>3</sub> = Pre-test for control class

0<sub>4</sub> = Post-test for control class

X = treatment using herringbone technique

Y = treatment using non-herringbone technique

Based on the above pattern, the subjects of research were classified into an experimental class (top line) and control class (bottom line). The quality of subjects was first checked by pretesting them (0<sub>1</sub> and 0<sub>3</sub>). Then, the experimental treatment (taught by using herringbone technique) was applied to the

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<sup>2</sup> Suharimi Arikunto, *Prosedur Penelitian...*, P.86

experimental class. This treatment was symbolized as “X”, while, the control class (taught using non-herringbone technique), this treatment was symbolized as “Y”. The test was held in the form of written. Then, the results of post- test ( $O_2$  and  $O_4$ ) were computed statistically.

## **B. Research Setting**

### 1. Subject and place of the research

This research was conducted at SMP Hasanuddin 6 Semarang. The subject of this study is the eighth grade of SMP Hasanuddin 6 Semarang in the academic year of 2014/2015.

The reason why the researcher choose SMP Hasanuddin 6 Semarang as a research place because the students are still lack of vocabulary, they can't understand about reading and writing. Besides that, SMP because Hasanuddin 6 Semarang is an Islamic-based school, in addition to the location is not too far from the campus where researcher studied.

### 2. Time of the research

This research was conducted during two weeks as of the ratification of the research proposal, starting from October 21<sup>st</sup> to November 6<sup>th</sup> 2014 on the first semester in the academic year of 2014/2015 counted since the proposal is submitted until the end of research.

## C. Subject of Research

### 1. Population

According to Arikunto, population is a whole subject in the research.<sup>3</sup> Population can be defined into two kinds, target of population and access of population. Target of population is population that has been planned in the research planning. Access of population is population that can be accessed when the researcher determines the number of population.<sup>4</sup>

The population of this research is all eighth grade of SMP Hasanuddin 6 Semarang in the Academic year of 2014/2015 which consist of three classes with twenty to twenty five students in each class.

### 2. Sample and sampling technique

Sample means apart of population that will be observed. Whose characteristics can represent and describe the real population.<sup>5</sup> Sample was done by taking the subject/sample which is not based on strata, random, or area but it is based on the consideration of a certain purpose. Some reason for using sample;

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<sup>3</sup>Suharsimi Arikunto, *Prosedur Penelitian: Suatu Pendekatan Praktik*, (Jakarta: PT. Rineka Cipta, 2010), p.173

<sup>4</sup> Sukardi, *Metodologi Penelitian Pendidikan*, (Yogyakarta: Bumi Aksara, 2010), P.53-54

<sup>5</sup> Sugiarto, *Teknik Sampling*, (Jakarta: Gramedia Pustaka Utama, 2003) 2<sup>nd</sup> Ed, P.2

- a. The large among of population.
- b. The observation that done for all unit of population may damage.
- c. Saving time, money, and power.
- d. Be able to give the comprehensive output.

In this research, the researcher used *non probability sampling* with total sampling or population sampling. *Non probability sampling* is sampling technique that does not provide the same opportunity for each element of population.<sup>6</sup> Total sampling or population sampling is sampling technique where all of the population become a sample.<sup>7</sup> The students of two classes, class B and C which consist of approximately 50 students, will be sample from the population. Class B will be the control class and class C will be the experiment class.

#### **D. Variables and Indicators of The Research**

Every research requires variable since it roles is the fundamental elements to support the study. The existences of variable determine the outcome of the research itself. In quantitative research, where variable are central and knowing the right variable ought to be based on its appropriate definition. As

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<sup>6</sup> Sugiyono, *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif dan R & D)*, (Bandung: Alfabeta, 2010) p. 122.

<sup>7</sup> Sugiyono, *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif dan R & D)*, (Bandung: Alfabeta, 2010), p. 124.

variable refers to Suharsimi Arikunto, it simply means the object in which the research is focused.<sup>8</sup>

According to Sugiyono, research variable is an attribute, characteristic, and value of person, object, or the variation of activity which has been determined by researcher to observe and take conclusion. There are two type of variables based on the term of causation:<sup>9</sup>

1. Independent variable (X)

Sugiyono said that, “independent variable can be called *stimulus*, *predictor*, or *antecedent*. Independent variable is variable which has the influence or the cause of change or make the existence of dependent variable.<sup>10</sup> So, the independent variable in this research is the use of Herringbone technique in teaching learning process. This variable affects the dependent variable throughout its treatments. The indicators from this variable are:

- a. Teacher gives a recount text to students.
- b. Students read the text.
- c. Students complete the graphic organizer based on the text.
- d. Students draw the main idea from the information written in graphic organizer.
- e. Teacher and students confirm their answers.

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<sup>8</sup> Suharsimi Arikunto, *Prosedur Penelitian*.....p.118

<sup>9</sup> Sugiyono, *Metode Penelitian*...p.60

<sup>10</sup> Sugiyono, *Metode Penelitian*...p.61

## 2. Dependent variable (Y)

Dependent variable is variable that is affected or that become the result because of the existence of the independent variable.<sup>11</sup> In this research, it has two dependent variables. Dependent variable in this study are:

- a. Students' reading skill in recount text
- b. Students' writing skill in recount text

The indicators from this variable are:

- a. identifying the definition, social function, generic structure and language features of Recount text
- b. finding the main idea of Recount text
- c. composing a simple recount text.

## **E. Methods of Data Collection**

To get the accurate data, in this research, the writer used two ways to collect data, they are follows:

### 1. Test

According to Arikunto, "a test is sequence of question of exercise often used to measure skill, knowledge, intelligent, or talent of individual class".<sup>12</sup> A test in simple term, is a method of measuring a person's ability, knowledge, or

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<sup>11</sup>Suharsimi Arikunto, "*Prosedur penelitian...*", p. 162.

<sup>12</sup>Suharsimi Arikunto, *Prosedur penelitian Suatu Pendekatan Praktek*, (Jakarta: PT. Rineka Cipta, 2010), p. 193.

performance in a given domain.<sup>13</sup> This research uses test to get the students' achievement that will be used as main data in measuring the improvement of students' reading and writing ability.

The researcher gathers the data by analyzing the test based on the material of Recount text. The researcher gave the test twice (pre-test and post-test) in both experimental class and control class.

a. Pretest

Before the teacher explained material by using herringbone technique, the teacher gave pre-test to experimental and control class in same way. It will be given before the experimental was run.

b. Post-test

Post-test was given to the experimental class and the control class. It was given in order to know students' understanding and score in recount text after they were taught by herringbone technique (experimental class) and using non-herringbone technique (control class).

The score of students' achievement can be calculated by using this following formula:<sup>14</sup>

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<sup>13</sup> H. Douglas Brown, *Language Assessment Principles and Classroom Practices*, (New York: Pearson Education, 2003), p.3

<sup>14</sup> Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik*, (Jakarta: PT. Rineka Cipta, 2006) P. 235



$$\text{Score} = \frac{\text{the number of right answer}}{\text{total item}} \times 100\%$$

## 2. Documentation

Besides data from result of the test, the documentation is needed to help the researcher run the research. According to Arikunto, “the documentation method is used to look for the data concerning matters or the variable that took the form of the note, transcript, book, newspaper, magazine, inscription, notes of a meeting, agenda, etc.”<sup>15</sup>

It refers to the archival data that helps the researcher to collect the needed data. The researcher will function the document related to the object research such as; students name list and their English score in previous time. It will help the researcher in doing the experimental. Students’ name list and score will be used in determining the team for the experimental and control classes. In this case, the data will be gained by the help of the English teacher.

## F. Data Analysis Technique

The data analysis method which used in this research is quantitative analysis. Quantitative is concerned with the amount of number.

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<sup>15</sup> Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik*, (Jakarta: PT. Rineka Cipta, 2006) P. 274

## 1. Try-out instrument

Try-out test analysis is mean to get the validity, reliability, index difficulty, and discriminating power. The tryout was given to VIII A of the students of SMP Hasanuddin 6 Semarang. After finishing the test, the answer sheets were collected in order to be scored. From 30 items test of tryout, some items were choosing of the instrument had been done by considering; validity, reliability, the degree of test difficulty and discriminating power as follows:

### a. Validity

The validity is an important quality of any test. It is a condition in which a test can measure what is supposed to be measured. According to Arikunto, “a test is valid if it measures what it purpose to be measured”.<sup>16</sup> The validity of an item can be known by doing item analysis. It is counted using product-moment correlation formula:

$$r_{xy} = \frac{N\sum xy - (\sum x)(\sum y)}{\sqrt{\{N\sum x^2 - (\sum x)^2\}\{N\sum y^2 - (\sum y)^2\}}}$$

Where:

- $r_{xy}$  = the correlation of the scores on two halves of the test
- $N$  = the number of students in class
- $X$  = the score of each component of test
- $y$  = the total score of correct answers

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<sup>16</sup> Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik*, (Jakarta: PT. Rineka Cipta, 2006) P. 65

- $\sum X$  = the sum of total X score in each class
- $\sum Y$  = the sum of total score from each student in the class
- $\sum XY$  = the sum of multiple score from each student with the total score.
- $\sum X^2$  = the sum of the square score in each component of test
- $\sum Y^2$  = the sum square of total score from each student in the class.

Calculation result of  $r_{xy}$  is compared with  $r_{table}$  of product moment by 5% degree of significance. If  $r_{xy}$  is higher than  $r_{table}$ , the item of question is valid.<sup>17</sup>

b. Reliability

Reliability means “consistent”.<sup>18</sup> It refers to the consistency of test scores. Besides having high validity, a good test should have high reliability too. Alpha formula is used to know reliability of test is K-R. 20.<sup>19</sup>

$$r_{11} = \left( \frac{n}{n-1} \right) \left( \frac{s - \sum pq}{s^2} \right)$$

Where:

- $r_{11}$  = the reliability coefficient of items
- n = the number of item in the test
- P = the proportion of students who give the right answer

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<sup>17</sup> Suharsimi Arikunto, *Dasar-Dasar Evaluasi Pendidikan*, (Jakarta: Bumi Aksara, 2007) 7<sup>th</sup> Ed, P. 78

<sup>18</sup> JB. Heaton, *Writing English Language Test*, (London: Longman, 1975), P. 155

<sup>19</sup> Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R&D*, (Bandung: Alfa Beta, 2008) P.132

- q = the proportion of students who give the wrong answer  
 $s^2$  = the standard deviation of the test

Calculation result of  $r_{11}$  is compared with  $r_{table}$  of product moment by 5% degree of significance. If  $r_{11}$  is higher than  $r_{table}$ , the item of question is reliable.<sup>20</sup>

c. Index difficulty

According to Arikunto, good question is not very easy and is not very difficult. The easy question will not stimulate the students to heighten their power in solve problem. Conversely, the difficult question will make the students be giving easily up and have not spirit try to solve that problem on the question. Because they think that the question is beyond the reach of their brain.<sup>21</sup>

Item analysis is carried out to find out the effectiveness of the items. It is mean to check whether each item meet the requirement of good test item or not.

To know the item difficulty, the researcher used the formula:

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

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<sup>20</sup> Suharsimi Arikunto, *Dasar-Dasar Evaluasi Pendidikan*, (Jakarta: Bumi Aksara, 2007) 7<sup>th</sup> Ed, p.100

<sup>21</sup> Suharsimi Arikunto, *Dasar-Dasar Evaluasi Pendidikan*, (Jakarta: Bumi Aksara, 2007) 7<sup>th</sup> Ed, p.208

Where:

P = index of difficulty

B = the number of students who answer an item correctly

JS = the total number of students

The index of difficulty level can be classified as follows:<sup>22</sup>

0, 00 < P ≤ 0, 30 is difficult

0, 30 < P ≤ 0, 70 is medium

0, 70 P ≤ 1, 00 is easy

d. Discrimination power

Item of discrimination power tells how well the item performs in separating the better students from the poorer students. If the good students tend to do well on an item the poor students do badly on the same item, then the item is a good one because it distinguishes the good students from the bad students. To calculate the index of discriminating power, the researcher used the formula:<sup>23</sup>

$$D = \frac{B_A}{J_A} - \frac{B_B}{J_B} = P_A - P_B$$

Where:

J<sub>A</sub> = Number of all students in the upper class

J<sub>B</sub> = Number of all students in the lower class

B<sub>B</sub> = Number of students in the upper class who answered the item correctly

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<sup>22</sup> Suharsimi Arikunto, *Dasar-Dasar Evaluasi Pendidikan*, (Jakarta: Bumi Aksara, 2007) 7<sup>th</sup> Ed, p.210

<sup>23</sup> Suharsimi Arikunto, *Dasar-Dasar Evaluasi Pendidikan*, (Jakarta: Bumi Aksara, 2007) 7<sup>th</sup> Ed, p.213

- $B_A$  = Number of students in the lower class who answered the item correctly
- $P_A$  = The proportion of the upper class who answered the item correctly
- $P_B$  = The proportion of the lower class who answered the item correctly

The criteria of determining the index of discriminating are below.<sup>24</sup>

$D = 0,00 - 0,20$  : poor

$D = 0,21 - 0,40$  : satisfactory

$D = 0,41 - 0,70$  : good

$D = 0,71 - 1,00$  : excellent.

## 2. Technique of scoring test

In measuring the test, a standard technique should be used to show the result of research were reliable. To measure the writing test the writer used the analysis method. According to J.B.Heaton analytic scoring test in writing test, there are five major items or categories. They are grammar, vocabulary, content, organization and mechanic.<sup>25</sup>

To analyze the students' test in writing recount text, the writer focused on the items in the elements of writing as states by Heaton. The elements of writing are content, organization, vocabulary, grammar and mechanic. After

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<sup>24</sup> Suharsimi Arikunto, *Dasar-Dasar Evaluasi Pendidikan*, (Jakarta: Bumi Aksara, 2007) 7<sup>th</sup> Ed, p.218

<sup>25</sup> J.B.Heaton, *Writing English Language Tests*, (London : Longman Class, 1975), p.138

classifying the test items, the writer gave score for each item with focused on organization of the content. Where score' organization higher than element of writing other. Concept maps help students to arrange a recount text. The percentage of the elements of writing can be seen in table 3.1.

**Table 3.1<sup>26</sup>**  
**Percentage of the Element of Writing**

<b>Element of writing</b>	<b>Score</b>
Content	30
Organization	35
Vocabulary	20
Grammar	20
Mechanic	5
<b>Total of score</b>	<b>100</b>

**Table 3.2<sup>27</sup>**  
**Scoring Guidance and the Explanation of Criterion**

<b>Categories</b>	<b>Score</b>	<b>Criteria</b>
Content	<b>30-27</b>	<b>Excellent to very good:</b> knowledgeable; substantive; thorough; development of thesis; relevant to assigned topic.
	<b>26-22</b>	<b>Good to average:</b> some knowledge of subject; adequate range; limited development of thesis; mostly relevant to topic, but lacks detail.

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<sup>26</sup> Douglas Brown, *Language Assessment Principles and Classroom Practice*, (US: Pearson Education, 2003) p.246.

<sup>27</sup> Arthur Hughes, *Testing for Language Teachers*, (New York: Cambridge University Press, 2003), p.104

<b>Categories</b>	<b>Score</b>	<b>Criteria</b>
	<b>21-17</b>  <b>16-13</b>	<b>Fair to poor:</b> limited knowledge of subject; little substance; inadequate development of topic. <b>Very poor:</b> does not show knowledge of subject; nonsubstantive; not pertinent.
Organization	<b>20-18</b>  <b>17-14</b>  <b>13-10</b>  <b>9-7</b>	<b>Excellent to very good:</b> fluent expression; ideas clearly stated/supported; succinct; well-organized; logical sequencing; cohesive. <b>Good to average:</b> somewhat choppy; loosely organized but main ideas stand out; limited support; logical but incomplete sequencing. <b>Fair to poor:</b> non-fluent; ideas confused or disconnected; lacks logical sequencing and development <b>Very poor:</b> does not communicate; no organization.
Vocabulary	<b>20-18</b>  <b>17-14</b>  <b>13-10</b>  <b>9-7</b>	<b>Excellent to very good:</b> sophisticated range; effective word/idiom choice and usage; word form mastery; appropriate register. <b>Good to average:</b> adequate range; occasional errors of word/idiom form; choice; usage but meaning not obscured <b>Fair to poor:</b> limited range; frequent errors of word/idiom form, choice, usage; meaning confused or obscured. <b>Very poor:</b> essentially translation; little knowledge of



Categories	Score	Criteria
		English vocabulary, idioms, word form.
Language use/grammar	<b>25-22</b>	<b>Excellent to very good:</b> effective complex construction; few errors of agreement, tense, number, word order/ function, articles, pronouns, prepositions.
	<b>21-18</b>	<b>Good to average:</b> effective but simple constructions; minor problems in complex constructions; several errors of agreement, tense, number, word order/ function, articles, pronouns, prepositions but meaning seldom obscured.
	<b>17-11</b>	<b>Fair to poor:</b> major problems in simple/complex constructions; frequent errors of negation, agreement, tense, number, word order/ function, articles, pronouns, preposition and fragments, run-ons, deletions; meaning confused or obscured.
	<b>10-5</b>	<b>Very poor:</b> virtually no mastery of sentence construction rules; dominated by errors; does not communicate.
Mechanics	<b>5</b>	<b>Excellent to very good:</b> demonstrates mastery of conventions; few errors of spelling, punctuation, capitalization, paragraphing.
	<b>4</b>	<b>Good to average:</b> occasional errors of spelling, punctuation, capitalization, paragraphing, but meaning not obscured.

Categories	Score	Criteria
	3	<b>Fair to poor:</b> frequent errors of spelling, punctuation, capitalization, paragraphing; poor handwriting; meaning confused
	2	<b>Very poor:</b> no mastery of conventions; dominated by errors of spelling, punctuation, capitalization, etc. paragraphing; handwriting illegible.

### 3. Pre-Requisite Test

Before the researcher determines the statistical analysis technique used, researcher examined the normality and homogeneity test of the data. To get the normality test and homogeneity, the researcher used pre-test score.

Pre-test was given before the treatments. The researcher determines the statically analysis technique whether both classes have normal distribution. If the data have normal and homogeny distribution, the treatment and teaching can be conducted to both classes.

#### 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.<sup>28</sup>

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<sup>28</sup>Sudjana, *Metode Statistika*, (Tarsito: Bandung, 2001), p.273

Calculate the Chi square ( $\chi^2$ ), the formula:

$$\chi^2 = \sum \frac{(O - E_i)^2}{E_i}$$

Determine the degree of validity (df). In the calculation of this data is arranged 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  $\alpha = 0,05$ .

Determine the distribution normality with test criteria: if  $\chi_{count} > \chi_{table}$  so the data is not normal distribution and other way if  $\chi_{count} < \chi_{table}$  so the data is normal distributio

b. Homogeneity test

Is used to know whether the data are homogeneous or not. The formula is:<sup>29</sup>

$$F = \frac{V_b}{V_k}$$

Where:

$V_b$  : bigger variance

$V_k$  : smaller variance

The hypotheses in homogeneity test are:

$$H_0 : \text{homogeny variance} = \sigma_1^2 = \sigma_2^2$$

$$H_a : \text{non homogeny variance} = \sigma_1^2 \neq \sigma_2^2$$

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<sup>29</sup>Sudjana, *Metode Statistika*, (Tarsito: Bandung, 2002), p.250

If the calculation result of  $f_{count}$  is lower than  $f_{table}$  ( $f_{count} < f_{table}$ ) by 5% degree of significant so  $H_0$  is accepted, it means the data is homogeneous or both of classes have the same variance.

c. Test of average

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

$$H_0: \mu_1 = \mu_2$$

$$H_a: \mu_1 \neq \mu_2$$

The formula that is used in the t-test as follows.<sup>30</sup>

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \quad \text{with} \quad S = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

where:

$\bar{x}_1$  : average of experimental class

$\bar{x}_2$  : average of control class

$n_1$  : number of experimental class

$n_2$  : number of control class

$s_1^2$  : standard deviation of experimental class

$s_2^2$  : standard deviation control class

Criteria test is  $H_0$  is accepted if  $-t_{1-\frac{1}{2}\alpha} < t < t_{\frac{1}{2}\alpha}$  where  $t_{\frac{1}{2}\alpha}$  obtained from the distribution list t with  $df = (n_1 + n_2 - 2)$  and opportunities  $(1 - \frac{1}{2}\alpha)$ . Values for other t  $H_0$  rejected.

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<sup>30</sup>Sudjana, *Metode Statistika*, (Tarsito: Bandung, 2002), p.239

#### 4. End Phase Analysis

To examine the hypothesis that have been stated, these followig 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:

$$H_0 = \mu_1 = \mu_2$$

$$H_a = \mu_1 \neq \mu_2$$

Where:

$\mu_1$  = average data of experimental class

$\mu_2$  = average data of control

The t-test formula is used:

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

Where:

$\bar{x}_1$  : average of experimental class

$\bar{x}_2$  : average of control class

$n_1$  : average of experimental class

$n_2$  : number of control class

$s_1^2$  : standard deviation of experimental class

$s_2^2$  : standard deviation of control class

Testing criteria that apply  $H_0$  is accepted  
 $t_{count} > t_{table}$  with determinate  $df = (n_1 + n_2 - 2)$  and  
the significant  $\alpha = 5\%$  ( $1 - \alpha$ ).