

## CHAPTER III

### RESEARCH METHOD

#### A. Research Design

This research was experimental research. There are some features of experimental research, one of them stated by Louis Cohen and Lawrence Manion, “The essential feature of experimental research is that investigators deliberately control and manipulate the conditions which determine the events in which they are interested”<sup>32</sup>.

At its simplest, the experiment involves making a change in the value of one variable –called the independent variable– and observing the effect that change on another variable –called the dependent variable. Independent variable is the label given to the variable that the experimenter expects to influence the other. And dependent variable is the variable upon which the independent variable is acting.

In this research, the writer used an experimental design of the actual/real experiment with the pattern of randomized control-group pretest - posttest design. In this design, a group of subjects taken and certain populations grouped into two groups namely experimental group and control group. The experimental group subjected to certain treatment variables in a certain period, and then both groups are

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<sup>32</sup>Louis Cohen and Lawrence Manion, *Research Methods in Education*, 4th Ed., (New York: Routledge, 1994), p. 164.

subjected to the same measurements, and then compared the results. Differences arising are considered based on treatment variables.

Before doing the research, the researcher observed the location and population were carried out. The research was done in two classes namely experimental class and control class. Before treating the students at Advanced Reading class using words structure clues and without using words structure clues, the researcher administered the pre-test to the students in both classes with the same instrument to know the homogeneity of student's reading skill.

The next step was the treatment, where the class TBI 3A as the experimental class was taught using words structure clues strategy and class TBI 3B as the control class was taught without using words structure clues strategy. The presentation of the lesson was done by the researcher.

Then, post-test was administered after finishing the treatment. The researcher used the same format of question that was administered in the try out test. Finally, the researcher made a calculation of the result from both tests.

## **B. Research Setting**

The research of this study was held at Advanced Reading class at 3<sup>rd</sup> semester of ELT Department at Tarbiyah Science and Teacher Training Faculty of IAIN Walisongo Semarang in the academic year of 2013/2014. The researcher conducted the research about a month. It was begun by observation and finished by giving the

posttest to know the effectiveness of word structure clues strategy. From 2<sup>nd</sup> September until 2<sup>nd</sup> October 2013, the researcher did the research for six meetings. It consisted of giving try out test, pre-test, presenting lesson, and giving post-test.

### **C. Population and Sample**

#### **1. Population.**

According to Margono in his book entitled “*Metodologi Penelitian Pendidikan*”, he said that, “Population is all data that concerns us in a scope and time that we specify”<sup>33</sup>. The population in this research is all students at Advanced Reading class at 3<sup>rd</sup> semester of ELT Department at Tarbiyah Science and Teacher Training Faculty of IAIN Walisongo Semarang in the academic year of 2013/2014. The population of the research was distributed as follow:

- a) Class TBI 3A with the number of 35 students.
- b) Class TBI 3B with the number of 30 students.

#### **2. Sample and Technique Sampling**

Sample is part of population, which is chosen to participate in the study. The researcher observed at Advanced Reading class at 3<sup>rd</sup> semester of ELT Department. As stated by Sugiarto, “Sampling is the process done to choose and take sample correctly from population so that it can be used as valid

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<sup>33</sup> Margono, *Metodologi Penelitian Pendidikan: Komponen MKDK*, (Jakarta: Rineka Cipta, 2009), p.118

representative to the population”<sup>34</sup>. In this research, the researcher took the subject of research randomly. The subjects were regarded that each of them has the equal chance to be chosen as the sample. The sample might be categorize in paired sample because there are experimental and control group that are compared. Two classes are chosen randomly, class TBI 3A is chosen as the experimental group which is taught by words structure clues strategy while class TBI 3B is chosen as the control group which is taught without words structure clues strategy.

The researcher’s consideration choosing the sample is based on the cognitive structure of the students in each class. At this ELT Department, the students are distributed thoroughly into their classes without regarding their cognitive competence. So, every class has the same right to be the sample of the research. In addition, there is a pre-test to ensure that students’ competence of both classes are equal.

#### **D. Variable of the Research**

Variable refers to the object of the research that becomes research focus. Suharsimi Arikunto explained that, “Variable is the object of research or something that be the concern of research”.<sup>35</sup>

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<sup>34</sup> Sugiarto, et al, *Teknik Sampling*, (Jakarta: Gramedia Pustaka Utama, 2003), p.4

<sup>35</sup> Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik*, p. 51.

There are two variables in experimental research. They are Independent (X) and Dependent Variable (Y).

This research, which used word structure clues as strategy to unlock the meaning of words, had two variables. Those variables are :

1. The independent variable

The first variable that is used in this research is independent variable. According to Ibnu Hadjar, “Independent variable is variable that influences because of change or emergence the dependent variable”.<sup>36</sup> The independent variable in this research was the use of words structure clues strategy to improve students’ reading ability at Advanced Reading class at 3<sup>rd</sup> semester of ELT Department.

2. The dependent variable

The second variable that is used in this research is dependent variable. As stated by Suharsimi Arikunto, “Dependent variable is variable that was affected or that became the result because of the existence of the independent variable”.<sup>37</sup> Dependent variable in this study was the students’ achievement in reading ability using words structure clues strategy.

## **E. Technique of Data Collection**

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<sup>36</sup> Ibnu Hadjar, *Dasar-dasar Metodologi Penelitian Kuantitatif dalam Pendidikan*, (Jakarta: PT. Raja Grafindo Perasada, 1996), p. 53.

<sup>37</sup> Suharsimi Arikunto, *Prosedur Penelitian : Suatu Pendekatan Praktik*, (Jakarta :PT. Asdi Mahasatya, 2006) 5<sup>th</sup> Ed.,p. 119.

In gaining the data, the researcher attempted to employ these following methods :

1. Test

To get the data, the researcher used test to measure the students achievement. Suharsimi Arikunto said that, “It is a set of questions and exercises used to measure the achievement or capability of the individual or group”<sup>38</sup>. In this research, there were two kinds of test, pretest and posttest that were given to the students as participants, either the experimental group or the control group. Before carrying out the teaching, the pretest was given to both groups in order to make sure that the two groups have similar and equal level of proficiencies. This test is given before the experimental was run. The post test was given to the experimental group after being taught by means of words structure clues strategy was given to the control one after being taught without words structure clues strategy. This posttest is given in order to know the improvement of students’ reading ability.

2. Documentation

Documentation is needed to collect the data. According to Arikunto, “Documentation refers to the method where the researcher investigates written object such as books, magazines,

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<sup>38</sup> Suharsimi Arikunto, *Prosedur Penelitian : Suatu Pendekatan Praktik*, (Jakarta:PT. Asdi Mahasatya, 2006) 5<sup>th</sup> Ed., p. 150.

etc”<sup>39</sup>. Documentation refers to the archival data that helps the researcher to collect the needed data. The researcher functioned the document related to the object research such as students name list at Advanced Reading class at 3<sup>rd</sup> semester of ELT Department at Tarbiyah Science and Teacher Training Faculty of IAIN Walisongo Semarang in the academic year of 2013/2014.

## **F. Data Analysis Technique**

### **1. Try Out Instrument of Test**

Before the test was used an instrument to collect the data, it had been tried out first to the students in another class. It is to analyze validity, reliability, difficulty level and also the discrimination power of each item. The try out test was given to TBI 5A of ELT Department at Tarbiyah Science and Teacher Training Faculty of IAIN Walisongo Semarang. The writer prepared 20 items as the instrument of the test. From 20 test items of try out.

The choosing of the instrument had been done by considering: validity, reliability, the degree of test difficulty and discriminating power.

#### **a. The 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

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<sup>39</sup> Suharsimi Arikunto, *Prosedur Penelitian : Suatu Pendekatan Praktik*, (Jakarta :PT. Asdi Mahasatya, 2006) 5<sup>th</sup> Ed., p. 158.

measured. According to Arikunto, “A test is valid if it measures what it purposes to be measured”.<sup>40</sup>

The validity of test is calculated using Product Moment Formula, which is as follows.

$$r_{xy} = \frac{N \sum XY - \sum(X) \sum(Y)}{\sqrt{\{N \sum X^2 - (\sum X)^2\} \{N \sum Y^2 - (\sum Y)^2\}}}$$

In which :

$r_{xy}$  : The correlation coefficient between X variable and Y variable

N : The number of students

$\sum X$  : The sum of score of X item

$\sum Y$  : The sum of score of Y item

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.

b. Reliability

Reliability is consistency of measurement. A reliable test score will be consistent across different characteristics of the testing situation. Besides having high validity, a good test

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<sup>40</sup> Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik*, (Jakarta: Rineka Cipta, 2006), 4<sup>th</sup> Ed., p. 65



should have high reliability too. Alpha formula is used to know reliability of test is K - R. 20.<sup>41</sup>

$$r_{11} = \left| \frac{k}{k-1} \left| 1 - \frac{\sum \sigma_i^2}{\sigma_t^2} \right| \right|$$

With formula varian item in the test below:

$$\sigma_i^2 = \left| \frac{\sum X^2 - \frac{(\sum X)^2}{N}}{N} \right|$$

In which:

$N$  = The number of students

With formula variant total below:

$$\sigma_t^2 = \left| \frac{\sum Y^2 - \frac{(\sum Y)^2}{N}}{N} \right|$$

In which :

$\sum Y$  = The number of item score

$\sum Y^2$  = The number of quadrate score

$N$  = The number of students

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<sup>41</sup> Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R&D*, (Bandung: Alfa Beta, 2008), p. 132

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.

c. Degree of Test Difficulty

After the try out test was conducted, each item is classified in the difficulty level by using formula:

$$\text{Degree of the Test Difficulty} = \frac{\text{Mean}}{\text{Maximum score that decided}}$$

In which,

$$\text{Mean} = \frac{\text{the number of score participant test in each certain item}}{\text{the number of participant test}}$$

Method to interpret degree of the test difficulty below:

**Table 2.**  
**The Interpretation of Degree of the Test Difficulty**

<b>Bigness of DD</b>	<b>Interpretation</b>
Less of 0,30	Very difficult
0,30-0,70	Medium
More than 0,70	Easy

d. Discriminating Power

The discriminating power is a measure of the effectiveness of a whole test. The higher and low values of discriminating power are the more effective the test will be.

$$DP = \frac{MA - MB}{\text{Maximum Score}}$$

In which:

$$MA = \frac{\sum X_A}{N_A} \text{ and } MB = \frac{\sum X_B}{N_B}$$

In which:

*DP* : Discriminating Power

*MA* : The average from upper group

*MB* : The average from lower group

*N<sub>A</sub>* : The number of student in upper group

*N<sub>B</sub>* : The number of student in lower group

The way to interpret discriminating power according to Anas Sudjiono as follow :

**Table 3**

**Interpretation of Discriminating Power**

<b>Bigness of DP</b>	<b>Classification</b>
Less of 0,20	<i>Poor</i>
0,20 – 0,40	<i>Satisfactory</i>
0,40 – 0,70	<i>Good</i>
0,70 – 1,00	<i>Excellent</i>
Negative sign	Thrown item

## 2. Pre-Request Test

Before the writer determined the statistical analysis technique used, she examined the normality and homogeneity test of the data.

### a. Normality Test

It is used to know the normality of the data that is going to be analyzed whether both groups have normal distribution or not. To find out the distribution data is done normality test with the Chi-square. Step by step Chi-square test is as follows:

- 1) Determine the range (R); the largest data reduced the smallest.
- 2) Determine the many class interval (K) with formula:

$$K = 1 + (3,3) \log n$$

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

$$P = \frac{\text{range}}{\text{number of class}}$$

- 4) Make a frequency distribution table
- 5) Determines the class boundaries (bc) of each class interval
- 6) Calculating the average  $\bar{X}$  ( $\bar{X}$ ), with the formula:

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

- 7) Calculate variants, with the formula:

$$S = \sqrt{\frac{\sum f_i (x_i - \bar{x})^2}{n - 1}}$$

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

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

X = Limit Class

$\bar{x}$  = Average

S = Deviation standard

- 9) Define the wide area of each interval
- 10) Calculate the frequency expository ( $E_i$ ), with formula:

$E_i = n \times \text{wide area}$  with the n number of sample

- 11) Make a list of the frequency of observation ( $O_i$ ), with the frequency observation as follows:

Class	Bc	Z	P	L	Ei	$\frac{O_i - E_i}{E_i}$
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- 12) Calculate the chi-square ( $X^2$ ), with the formula:

$$X^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$$

- 13) Determine the degree of validity (dk). In the calculation of this data is arranged in list of frequency distribution consisting of k pieces so that the interval to determine the criteria test used formula  $dk = k-3$ , where k is the number of class intervals and  $\alpha = 5\%$
- 14) Determining the value of  $X^2$  table
- 15) Determining the distribution normality with test criteria:

If  $X^2_{count} > X^2_{table}$  so the data is not normal distribution and the other way if the  $X^2_{count} < X^2_{table}$  so the data is normal distribution.<sup>42</sup>

b. Homogeneity Test

Is used to know whether experimental class and control class, that are taken from population have same variant or not. According to David Nunan in his book entitled “*Research Method in Language Learning*”, he said that, “A test should be given to both classes of students before the experiment just to make sure that the both classes really are the same”.<sup>43</sup> The steps as follow:

- 1) Calculate variants both classes (experimental and control classes), with the formula:

$$S_1^2 = \frac{\sum (x - \bar{x})^2}{n_1 - 1} \text{ And } S_2^2 = \frac{\sum (x - \bar{x})^2}{n_2 - 1}$$

- 2) Determine  $F = \frac{Vb}{Vk}$

Where:

Vb : Bigger Variant

Vk : Smaller Variant

Determine dk =  $(n_1 - 1) : (n_2 - 1)$

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<sup>42</sup> Sudjana, *Metode Statistika*, (Bandung: Tarsito, 1996), p. 273

<sup>43</sup> David Nunan, *Research Methods in Language Learning*, (New York: Cambridge University Press, 1992), p. 27

- 3) Determine  $F_{table}$  with  $\alpha = 5\%$
- 4) Determining the distribution homogeneity with test criteria:

If  $F_{count} > F_{table}$ , the data is not homogeneous and the other way if the  $F_{count} < F_{table}$ , the data is homogeneous.<sup>44</sup>

c. Test of the Average

Test of average is used to examine average whether experimental group and control group have been decided having different average.<sup>45</sup>

T-test is used to analyze the data of this research. “A t-test used to measure or to compare the mean scores of the two groups”.<sup>46</sup>

If  $\sigma_1^2 = \sigma_2^2$  (has same variant), the formula is:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{S \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

With :

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<sup>44</sup> Sudjana, *Metode Statistika*, (Bandung: Tarsito, 1996), p. 250

<sup>45</sup> Anas Sudijono, *Pengantar Statistik Pendidikan* (Jakarta: PT. Raja Grafindo Persada, 1995) 6<sup>th</sup> Ed, p. 264

<sup>46</sup> James Dean Brown and Theodore S. Rodgers, *Doing Second Language Research*, (New York: Oxford University Press, 2002), p. 205

$$S = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

In which :

$\bar{X}_1$  : The mean score of the experimental group

$\bar{X}_2$  : The mean of the control group

$n_1$  : The number of experimental group

$n_2$  : The number of control group

$S_1^2$  : The deviation standard of experimental group

$S_2^2$  : The deviation standard of both groups

If  $\sigma_1^2 \neq \sigma_2^2$  (has no same variant) the formula is:

$$t^1 = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

The hypotheses are:

Ho =  $\mu_1 = \mu_2$

Ha =  $\mu_1 \neq \mu_2$

$\mu_1$  : average data of experimental group

$\mu_2$  : average data 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



$dk = (n_1 + n_2 - 2)$  and opportunities  $(1 - \frac{1}{2}\alpha)$ . Values for other t Ho rejected.<sup>47</sup>

### 3. Analysis Phase End

#### 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. Test Average (Right-hand Test)

Proposed hypothesis test in average similarity with the right test is as follow:

$$H_0 = \mu_1 = \mu_2$$

$$H_a = \mu_1 > \mu_2$$

If  $\sigma_1^2 = \sigma_2^2$  (has same variant), the formula is:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{S \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

With

$$S = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

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<sup>47</sup> Sudjana, *Metode Statistika*, (Bandung: Tarsito, 1996), p. 239

Where:

$\bar{X}_1$  : The mean score of the experimental group

$\bar{X}_2$  : The mean of the control group

$n_1$  : The number of experimental group

$n_2$  : The number of control group

$S_1^2$  : The deviation standard of experimental group

$S_2^2$  : The deviation standard of both group

If  $\sigma_1^2 \neq \sigma_2^2$  (has no same variant) the formula is:

$$t^1 = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

Testing criteria that apply Ho is accepted if  $t_{count} > t_{table}$  with determine  $dk = (n_1 + n_2 - 2)$  and  $\alpha = 5\%$  with opportunities  $(1 - \alpha)$ . Values for other t Ho rejected.<sup>48</sup>

## G. Research Procedure

The data was collected by the researcher by doing some activities. The steps of collecting the data includes preliminary visit, contact the lecturer, ask the data about the students as participants, give pre-test, give treatments, give the post-test. The procedures of collecting the data could be seen in the following table.

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<sup>48</sup> Sudjana, *Metode Statistika*, (Bandung: Tarsito, 1996), p. 243.

**Table 4. Procedure of the Research and Collecting the Data**

<b>No</b>	<b>Task</b>	<b>What to prepare</b>	<b>Date</b>
1	Preliminary research		Monday, 2 <sup>nd</sup> September 2013
2	Contacted the Dean of Tarbiyah Science and Teacher Training Faculty	Research permission letter	Wednesday, 4 <sup>th</sup> September 2013
3	Contacted the lecturer at Advanced Reading Class	Lesson plan and research permission letter	Friday, 6 <sup>th</sup> September 2013
4	Gave pre-test	Pre-test worksheet, Lesson plan, handbook, and worksheets	Thursday, 12 <sup>th</sup> September 2013
5	Gave treatment		1. Wednesday, 18 <sup>th</sup> September 2013. 2. Friday, 20 <sup>th</sup> September 2013
6	Gave post-test	Post-test worksheet	Monday, 23 <sup>th</sup> September 2013

1. Preliminary Visit

The researcher visited the campus to get information about the students, the class, and the Institute. To gain the information, the researcher asked the administration officer to get information about setting and participants.

2. Contacted the Dean of Tarbiyah Science and Teacher Training Faculty

Having got the information about setting and participant, the researcher did the second visit to meet Dean of Tarbiyah Science and Teacher Training Faculty by giving the permission letter.

3. Contacted the lecturer at Advanced Reading Class

Researcher asked permission to the lecturer of Advanced Reading Class by giving research proposal, lesson plan, instrument, and letter of permission to do research in her class.

4. Gave Pre-test

In this session, the researcher gave the pre-test of Words Structure Clues. Both experimental and control group were given this kind of test. This test was to ensure that both two groups were the same in understanding the meaning of reading text. In addition, the results or score of the test were used to determine the students' groups.

5. Gave the Treatment

After giving pre-test, the researcher gave treatment to the experimental class and control class. The experimental class was given the treatment and taught by researcher as the experimenter by means words structure clues strategy while the control group was taught by the same teacher and material but was different in teaching strategy that was by

means without using words structure clues strategy. The students received the treatment twice.

6. Gave Post-test

The last activity that done by the researcher was giving posttest both experimental class and control class. Having administered the treatment for twice, the post-test was given to both groups to test their understanding in unlocking the meaning of reading text. It is done to measure students' reading ability after treatment is given.