

CHAPTER III

RESEARCH METHODOLOGY

A. Form of Research

The research took interest in implementing an experimental design. An experimental design is the general plan for carrying out a study with an active independent variable. The design is important because it determines the study's internal validity, which is the ability to reach valid conclusions about the effect of the experimental treatment on the dependent variable (Ary *et al* (2010: 301). Research method is a procedure that used in research systematically. Phakiti (2014: 22) defines that the definition of experimental research is:

"Experimental research is a useful research methodology for those studies that aim to address a causal-like relationship. It allows researchers to strictly control the influence of factors that are not of interest by setting them constant across groups, but to vary the degree of a factor under study across groups of learners in order to understand a causal-like relationship".

It means that an experimental research is to investigate the correlation between cause and effect and how far its correlation is by giving treatment to experimental group and control group as the comparison.

There are some kinds of experimental research. The kind of an experimental research that is applied in this research was pre-experimental one group pre-test post-test. Cohen *et al* (2007: 301) state that pre-experimental pre-test and post-test research is proceeded to account for differences between pre-test and post-test scores by reference to the effect of treatment.

Meanwhile, Singh (2006: 141) states that pre-experimental design consists of comparing the growth of a single group under two different sets

of the condition. It means that pre-experimental does not need a control group to compare with the experimental group.



FIGURE 3.1 a diagram of one-group pretest-posttest design (Taken from Phakiti, 2014:57)

B. Population and Sample

a. Population

The population is the group from which data are collected or a sample is selected. According to Urdan (2005: 1) population is an individual or group that represents all the members of a certain group or category of interest. Population refers to all the members of a particular group. It is the group of interest to the researcher, the group to whom the researcher would like to generalize the result of a study (Fraenkel *et al*, 2012:92).

The population in this research was all of the tenth-grade students of SMAN 01 Sungai Tebelian in the academic year of 2017/2018. The total populations were 142 students divided into five classes. The classes are X MIA 1, X MIA 2, X IIS 1, X IIS 2, X IIS 3. The population could be seen below.

Table 3.1

Research Population

No	Class	Total

1	X MIA 1	25
2	X MIA 2	28
3	X IIS 1	30
4	X IIS 2	30
5	X IIS 3	29
	Total	142

b. Sample

The technique of sample that the researcher used was cluster random sampling. According to Cohen *et al* (2007: 112), the advantages of using cluster sampling is the researchers can select a specific number of population and take all those populations as the representative of their subject of research. Kothari (2004:65) states:

“ if the total area of interest happens to be a big one, the convenient way in which a sample can be taken is to divide the area into a number of smaller non-overlapping areas and then to randomly select a number of these smaller area, with the samples consisting of all units in these small area”.

The sample in this research represented the population. In this research, the researcher took the sample through cluster random sampling by choosing a class of the population randomly as a pre-experimental class. The researcher wrote on a piece of paper class X MIA 1, X MIA 2, X IIS 1, X IIS 2, X IIS 3. Then the researcher took one of the papers randomly. The class that has taken by the researcher was X MIA 1. Because of that, the sample of this research was X MIA 1.

C. Technique of Collecting Data

To support the investigation the researcher needs the data. Technique of collecting data is the process of gathering and measuring information on targeted variables in an established systematic fashion, which then enables one to answer relevant questions and evaluate outcomes.

Measurement is the technique in this research that could help the writer to know the students' score. It will make the researcher easier to analyze the ability of students' reading comprehension. Measurement is a process that assigns a numerical descriptive to some attributes of an object, person, or event (Ross, 2005: 33).

In addition, The students are given some questions about the narrative text. By this measurement technique, the researcher used it to know about the students' reading comprehension by the test that has given, to determine how well the ability of the students' reading comprehension by using contextual guessing technique.

D. Tools of Collecting Data

Reading test is a tool which is used to measure the students' achievement in reading comprehension. Reading test is also used to measure the person's competence and to achieve the objective. In a test, the researcher has at their disposal a powerful method of data collection, an impressive array of tests for gathering data of a numerical rather than verbal kind Cohen *et al* (2007:414).

Besides, Ary *et al.* (2010:201) stated that a test is a set of stimuli presented to an individual in order to elicit responses on the basis of which a numerical score can be assigned. In this research, the reading test is the tool to get data on students' result study. Because of this research used pre-experimental research design, the test that used in this research was at the pre-test and the post-test. In other words, the test has given before and after the contextual guessing teaching in the class.

To determine whether or not the test valid, the researcher took the validity of the instrument. Validity is an instrument to measure what it purpose to measure. The researcher needs to carefully in the selection of the instrument which is used and also to determine the use of the instrument is compatible or not in based on researcher intended. Cohen, *et al* (2007:133) stated that validity is an important key to effective research. If a piece of research is not valid then it is worthless. The validity test would be used to measure the test itself by the supporting evidence.

The validity that used in this research was content validity. Cohen *et al* (2017:163) said that content validity is achieved by making professional judgments about the relevant and sampling the contents of the test to a particular domain. In this research, the researcher asked the professional to act as a validator, checked the content of the test to determine whether the test valid or not.

The of procedure content validity got valid or not to the content of the test. Explanation implementation of content validity could be seen as follows:

1. In the implementation stage in content validity, the researcher made letter permission recommendation validator and asked professional to act as the validator.
2. Then, the researcher made a blueprint and also instrument pre-test and post-test.
3. Next stage, the researcher asked for the validator to analyze instrument pre-test and post-test to determine whether the test valid or not.
4. The last stage after validator checked and get test valid the researcher used instrument pre-test and post-test.

E. Techniques of Data Analysis

In order to find out the answer to research questions and to test the hypothesis of research, the procedures of data analysis are required. The data analysis used in this research was a descriptive statistic. As stated by Cohen *et al* (2007:503) that descriptive statistic described and present the data. It meant that this research the descriptive statistic was used to describe the data gathered. Techniques of data analysis come from the interpretation of data collection.

In addition, in the experimental research the major data is in form of number, thus the researcher needs some formula in order to be able to explain it into meaningful sentence. Cohen *et al* (2007: 501) mentioned that numerical analysis can be performed using software, for example the Statistical Package for Social science (SPSS, Minitab, and Excel). For that reason, the researcher used Statistical Package for Social science (SPSS) 24 version in order to help the researcher to calculate the data. Below are the formulas of each technique of data analysis that the researcher used in this research:

1. The Students' Individual Score of Pre-Test and Post-Test

To analyze the students' individual test, the researcher used the formula as follow:

$$X1 = \frac{R1}{N1} \times 100 \qquad X2 = \frac{R2}{N2} \times 100$$

Notes:

X1 = Students' mean score of pre-test

X2 = Students' mean score of post-test

R1 = Students' correct answer of pre-test

R2 = Students' correct answer of post-test

N1 = Total number of pre-test items

N2 = Total number of post-test items

Taken from Cohen et al (2007: 512)

2. The Students' Mean Score of Pre-Test and Post-Test

To analyze the students' mean score of pre-test and post-test, the researcher used the formula as follow:

$$\bar{X}_1 = \frac{\sum X_1}{N_1} \qquad \bar{X}_2 = \frac{\sum X_2}{N_2}$$

Notes:

\bar{X}_1 =The students' mean score of pre-test

\bar{X}_2 =The students' mean score of post-test

$\sum X_1$ =The total score of students' pre-test

$\sum X_2$ =The total score of students' post-test

N_1 =The total number of students' pre-test

N_2 =The total number of students' post-test

Taken from Ary et al (2010: 108)

After the researcher calculated the mean score of pre-test and post-test, the researcher calssified the score according to the Brown.

Table 3.2 Achievement Level Classification

Test Score	Classification
80-100	Good to Excellent
60-79	Average to good
50-59	Poor to average
0-49	Poor

Taken from Brown (2003:287)

3. Analyze the Students' Difference Score of Pre-Test and Post-Test

To analyze students' different score of pre-test and post-test, the researcher used the formula as follow:

$$\bar{D} = \bar{X}_2 - \bar{X}_1$$

Notes:

\bar{D} = Interval of pre-test and post-test

\bar{X}_1 = The mean score pre-test

\bar{X}_2 = The mean score of post-test

Taken from Cohen et al (2007:423)

4. Standard Deviation

Standard deviation is utilized by the researcher to calculate in depth of the mean score that previously acquired by the researcher. In depth here means that in order to see the distribution or spread around the mean score of the correct formula to seek this data is through Standard Deviation formula. As stated by Brase and Brase (2012:95) argue that standard deviation is used to picture the dispersion around the mean score. In order words standard deviation refers to the difference between an individual score in a distribution and the average score for the distribution. The formula of standard deviation is as follow:

$$SD = \sqrt{\frac{\sum d^2}{N - 1}}$$

Notes:

SD = Standard deviation

d^2 = The deviation of the score from the mean (average)

\sum = The sum of value

N = The number of cases in the sample

Taken from Cohen et al (2007:512)

5. Normality Test

In order to find out the data is distributed as normal distribution or not, the researcher needs to calculate the normality of the data of pre-test and post-test and to analyze the normality of the data the researcher used Kolmogorov-Smirnov test that available in SPSS 24 version. As stated by Sugiyono (2013:257) the Kolmogorov-

Smirnov test would find out the data distribution by comparing the p-value (p) to the alpha-value (α). If the value of $p < \alpha$ (0,05) it means the data is not normally distributed. If the value of $p \geq \alpha$ (0,05) it means the data is normally distributed.

6. Testing of Hypothesis

The test that used for testing the hypothesis is depending on the result of the calculation of the Kolmogorov-Smirnov test. If the result of Kolmogorov-Smirnov test indicates that the data is in a normal distribution, the researcher would continue the calculation to determine the research hypotheses by using paired sample t-test with the level confidence 95% (parametric method) that available in SPSS 24 version to test the hypothesis. The formula to calculate the t-test is as followed:

$$t = \frac{\bar{D}}{\sqrt{\frac{\sum D^2 - \frac{(\sum D)^2}{N}}{N(N-1)}}$$

Notes:

t = The students' significant score

\bar{D} = Average difference

$\sum D^2$ = Different scores squared, then summed

$(\sum D)^2$ = Difference scores summed then squared

N = Number of pairs

Taken from Ary et al (2010: 177)

If the result of Kolmogorov-Smirnov test shows that the data is not normally distributed, the researcher would use Wilcoxon-Mann-Whitney test or (U-test) (non-parametric method) that available in SPSS Statistic 24 to test the hypothesis. The formula of U-test as follows:

$$U = n_1 \cdot n_2 + \frac{n_1 (n_1 + 1)}{2} - R_1$$

Notes:

$n_1 \cdot n_2$ = the sample sizes

R_1 = the sum of ranks assigned to the values of the first sample

Taken from Kothari (2004:294)

The result of the data computation would be the conclusion for deciding the hypothesis. To answer the first question, whether or not the effect of contextual guessing technique effective, the researcher would use the t-test value of t-test. If the value of $t > t$ table, or the U-value $>$ U-table, it means that contextual guessing technique is effective and H_0 is rejected.

7. The Effect Size of Treatment

In order to know how significant the treatment that has given, the researcher used effect size. Creswell (2012: 188) described that effect size is a means for identifying the practical strength of the conclusions about group differences or about the relationship among variables in a quantitative study. The formula is to calculate the effect size is as follows:

$$ES = \frac{\overline{X2} - \overline{X1}}{SD_{pooled}}$$

Notes:

ES = Effect size

$\overline{X1}$ = Mean score of pre-test

$\overline{X2}$ = Mean score of post – test

SD_{pooled} = Standard deviation of pre-test + standard deviation of post-test

Table 3.3
Qualification the Effect Size

Effect Size	Qualification
0 – 0,20	Weak effect
0,21 – 0,50	Modest effect
0,51 – 1,00	Moderate effect
>1,00	Strong effect

Taken from Cohen et al (2007: 521)

F. The Implementation of pre-experimental

There is some procedure in this research. The researcher was doing administration in the population, giving pre-test, giving treatment, giving post-test and analysis and conclusion.

a. Administration

At this stage the researcher asked permission to Principal of SMAN 1 Sungai Tebelian to conduct the research. After gaining the permission, the researcher determined the sample by using cluster random sampling

b. Pre-test

In this step, the researcher distributed a reading test to students. From the test, the researcher could find out their individual score and mean score of reading comprehension. Therefore, researchers determined the ability of the tenth grade in comprehend a reading text.

c. Treatment

After the researcher did a pre-test and knew students' score of reading comprehension, the researcher gave them a treatment. The researcher introduced and implemented the contextual guessing technique to teach reading comprehension in narrative text.

d. Post-test

In the last stage, the researcher also distributed a reading comprehension test to the students. From the post-test, the researcher knew the result of the implementation of contextual guessing technique towards the sample's reading comprehension.

e. Analysis and Conclusion

Finally, the researcher analyzed and compared the data of pre-test and post-test and concluded whether the contextual guessing technique effective to be used for teaching reading comprehension.