CHAPTER III

RESEARCH METHODOLOGY

A. Form of research

In order to investigate the effectiveness of story mapping in teaching reading comprehension on narrative text, the researcher uses pre-experimental study. Cohen, Manion & Morrison, (2007:282) state that "The pre-experimental study consists of three designs they are one-shot case study, one group pre-test and pos-test design, and the static-group comparison design the design of research is one group pre-test post-test design". One group pre-test and post-test design is a research procedure that has no control or comparison group. According to Ary, Jacobs and Sorensen (2010:303), one group pre-test and post-test design involves three steps (1) administering a pre-test measuring the dependent variable; (2) applying the experimental treatment X to the subjects; and (3) administering a post-test. In line with the statement above, the researcher choosed this design to find whether or not the use of story mapping effective in teaching reading by comparing the result of students' achievement from the students' pre-test and post-test.

One group pre-test and post-test design is represented as follows:

O_1	X	O_2

(Adapted from Cohen, Manion & Morrison, 2007:282)

Where:

O$_1$ = Pre-test

T = Treatment

O$_2$ = Post-test

The application of pre-test, treatment, and post test can be illustrated as follow:

a. Pre-test (O$_1$) is administrated to measure the students' mean score on vocabulary achievement before giving the treatment.

b. Apply the treatment (T) in teaching reading comprehension on narrative text through story mapping.

c. Apply the post-test (O$_2$) to measure the students' mean score on reading comprehension achievement after giving the treatment.

d. Then, compare the pretest (O$_1$) and post-test (O$_2$) to determine the students' interval score of pretest and post-test.

e. Apply *t*-test formula to find out whether or not the story mapping effective to be use in teaching reading comprehension.

f. Apply ES formula to find out how effective the use of story mapping in teaching reading comprehension.

In this research, the treatment was conducted in three times. Before the treatment, the researcher gave the pre-test to know the students' achievement before the follow the treatment. After the treatment, the researcher gave the student post-test to know the students' achievement after they follow the treatment.

B. Population and Sample

In this part, the researcher would explain about population and sample for the research. Population and sample constitute the subject of research. In educational research, population and sample is the people who directly involve in education just like teacher and students. Because this research focuses to the students, the population and sample in this research is the students.

1. Population

A population is the total of all the individuals who have certain characteristics and are of interest to a research. It is support with the statement from Cohen, Manion and Morrison (2000:91) state that the population is defined as all members of any well-defined class of people, events, or objects. The population of this research is the students at tenth grade of SMAN 1 Sungai Betung which consist of 3 classes: Class X A, X B, and X C.

Population of this research will be taken as follows:

No	Classes	Total of students
1	XA	25 Students
2	XB	25 Students
3	XC	27 Students
Total	3 Classes	78 Students

2. Sample

Sample is a small proportion who will participate of this research. This statement is supported by Cohen, Manion and Morrison (2000:93), "Sample

is the small group that is observed". In this research, the researcher uses cluster sampling. Cluster sampling technique is the technique to select a sample is not based on the individual, but rather is based on the group. According to Ary et al (2010:154), "In cluster sampling, list all the members of a target population and select a sample from among them". The sample in this research does not include all the tenth grade students, but the researcher selects one class as a sample of this research. The researcher select sample is taken from class X A, while the number of the class is 25 students.

C. Technique and Tools of Collecting Data

1. Technique of Collecting Data

   In collecting the data of this research, the researcher is going to use measurement technique. Kaplan in Marczyk, Dematteo and Festinger (2005: 95), "Measurement can be defined as a process through which researchers describe, explain, and predict the phenomena and constructs of our daily existence". The measurement technique will be applied to measure the students' achievement on narrative text.

   The test will be conducted twice. First, pre-test will be conducted to collect the data to find out the baseline scores and the pre condition of the students' narrative text achievement before giving the treatment. Second, post-test will be conducted to collect the data after giving the treatment. Both of the results will be measured by using t-test in order to find out the significance of interval score between pre-test and post-test whether the achievement is significant or not.

2. Tools of Collecting Data

The tool of data collecting in this research was objective test. This tool is used to know the achievement of the students' reading comprehension after they are giving paired reading and story mapping technique. The type of objective test item to be used is multiple choices which consist of 40 questions. Blerkom (2009:89) says that "The advantage of multiple choice formats is the items can be scored very quickly and they can be scored objectively". Based on the technique of data collecting above, the researcher decides to measure the students' achievement through tools reading test a set of multiple choice test, the test consist of 40 question with 5 choices a, b, c, d and e (see Appendix 50).

1. Validity Test

Marczyk, (2005:158) defines "Validity refers to the conceptual and scientific soundness of a research study or investigation, and primary purpose of all forms of research is to produce valid conclusions". Cohen (2005:131) defines "Content validity is achieved by ensuring that the content of the test fairly samples the class or fields of the situation or subjects matter in question.

Since the aim of this research is to determine the significance of the interval score of pre-test and post-test in teaching, the content validity is used. As the test is constructed to measure the representative sample of the subject matter, the researcher constructs the table of specification. (see Appendix 66)

2. Level of difficulty (LD)

    The level of difficulty is to know how easy or difficult items are from the students' point of view will take the test, the formula as follow:

$$LD = \frac{HG + LG}{N}$$

Note:

LD = Level of difficulty

KG = High group (the number of higher group' correct answer)

LD = Low group (the number of lower group' correct answer)

N = total number of students who takes the test.

The percentage of discriminating power as follow:

The level of difficulty (DP)	The item qualification (IQ)
Minus to 0.29	Revised/discarded (R)
0.30 to 0.49	Difficult (D)
0.50 to 0.79	Moderate (M)
0.80 to 0.92	Easy (E)

Adapted from Best (1977:260)

In determining the number of high group and low group, the researcher took one third of the total sample who took the try out test. Since the total sample 25 students, so the number of high group and low group was 15 students. Only the highest and lowest groups were involved in this calculation. The example of the calculation is as follow:

As it was gained in item 1 HG = 15 LG = 5 and N = 40

$$LD = \frac{15+5}{40}$$

LD = 0.5

The level of difficulty shows 0.50 means the test item is qualified "Moderate".

3. Discriminating Power (DP)

Grondlund (1995:112) stated that the "Discriminating power of an achievement test item refers to degree of which is describe between pupils with high and low achievement".

The discriminating power is calculated using the following formula:

$$DP = \frac{HG - LG}{\frac{1}{2}N}$$

Note:

DP = Discriminating Power

HG = High Group (the number of higher group's correct answers)

LG = Low Group (the number of lower group's correct answers)

½ N = Half number of the students taking part in the test.

As it was gained in item 1 HG =10, LG = 5 and ½ N = 10

$$DP = \frac{10-5}{10}$$

DP = 0.5

The percentage of discriminating power shows 0.5 means the test item is classified "Very Good".

The criteria used to classify the Discriminating Power are developed by Best (1997:261) as the illustration provided below:

The Percentage of DP	Item Qualification (IQ)
0.40 to 1.00	Very Good/Excellent (K)
0.30 to 0.39	Good (G)
0.20 to 0.29	Sufficient (S)
Minus to 0.19	Bad/Revised (R)

4. Reliability Test.

A test want to reliable if the result of the test is consistent. As Gronlund (1977:138) stated that, "Reliability refers to the consistency of test scores".

The researcher gave the try out first to X B before giving the pre-test to X A. After calculating the result of the try out by using reliability coefficient Kuder Richardson (KR$_{21}$), the reliability coefficient of the test is "92.31). Based on the criteria used to determine the reliability of the test categorized "high to very high". The test is reliable to collect the data. The coefficient of reliability can be obtained by using the formula introduced by Kuder Richardson as follows:

$$KR_{21} = \frac{K}{K-1} \left[1 - \frac{X\,(K-X)}{K(s)^2} \right]$$

Where

KR_{21} = Kuder Richardson Reliability Coefficient

K = The number of items in the test

X   = The means score on the test for all the students

S   = Standard deviation of all students' scores

The criteria used to classify the reliability coefficient of the test score according to Best (1977:260) as follow:

COEFFICIENT	RELATIONSHIP
0.00 – 0.20	Negligible
0.21 – 0.40	Low
0.41 – 0.60	Moderate
0.61 – 0.80	Substantial
0.81 – 1.00	High – Very High

The number of the students who participated in try out was selected 25 students. Before calculating the reliability of the try out test, the researcher calculates the students' mean score and the standard deviation of the try out result (see table 1.2).

The students' mean score is calculated by using the mean formula:

$$\bar{X} = \frac{\sum X}{N}$$

Where:

$\bar{X}$ = The mean of students' test score

$\sum X$ = The total sum of the scores

N   = Number of students

$$\bar{X} = \frac{\sum X}{N}$$

$$= \frac{256}{24}$$

$$= 10.66$$

The standard deviation of the test result is calculated as follows:

$$SD = \frac{\sqrt{\sum x^2 - \left(\frac{\sum x}{N}\right)^2}}{N}$$

$$= \frac{\sqrt{17312.5 - \left(\frac{256}{24}\right)^2}}{24}$$

$$= \frac{\sqrt{17312.5 - 113.81}}{24}$$

$$= \sqrt{716.61}$$

$$= 26.76$$

The reliability of the test is:

$$\mathbf{KR_{21}} = \frac{K}{K-1}\left[1 - \frac{X\,(K-X)}{K(s)^2}\right]$$

$$= \frac{40}{40-1}\left(1 - \frac{10.66\,(40-10.66)}{40\,(26.76)^2}\right)$$

$$= \frac{40}{39}\left(1 - \frac{10.66\,(29.34)}{40\,(716.09)}\right)$$

$$= 1.02\left(1 - \frac{312.76}{28643.6}\right)$$

$$= 1.02\,(1 - 91.5)$$

$$= 1.02\,(-90.5)$$

$$= 1.02\,(-90.5)$$

$$= 92.31$$

From the computation above, the reliability coefficient indicates "92.31".

Base on the criteria used to determine the reliability of the test categorized "high to very high".

D. Technique of Data Analysis

In order to know whether the story mapping is effective or not, then will be calculated:

a. Analysis on the student's individual scores of the pre-test and post-test.

The total score of student's individual score is summed with a formula:

1) Student's Individual Score of pre-test and post-test

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

Where:

S = Student's individual score

R = The right answer

N = The number of the test items

2) Student's Individual Score of post-test

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

Where:

S = Student's individual score

R = The right answer

N = The number of the test items

Hatch and Larazaton (1991:162,288-289)

b. Analysis on the students' mean score of pre-test and post-test

1) The mean score of pre-test and post-test

$$\overline{X_\iota} = \frac{\sum X_\iota}{N}$$

Where:

$\bar{X}_1$ = The students' mean score

$\sum X\iota$ = Sum of students' individual scores

N = Number of students

2) The mean score of post-test

$$\overline{X_2} = \frac{\sum X_2}{N}$$

Where:

$\overline{X_2}$ = The students' mean score

$\sum \overline{X_2}$ = Sum of students' individual scores

N = Number of students

(*Hatch & Farhady, 1982:10*)

c. Analysis on the students' interval score of pre-test and post-test

$$\overline{D} = \overline{X_2} - \overline{X_1}$$

Where:

$\overline{D}$ = The interval of pre test and post-test

$\overline{X_1}$ = The mean score of pre-test

$\overline{X_2}$ = The mean score of post-test

(*Hatch & Farhady, 1982:148*)

d. Analysis on the students' significance score of pre-test and post-test.

t- Test is used to analyze the treatment influence.

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

Where:

T = The *t*-value for correlated means

$\overline{MD}$ = The interval score of pre-test and post-test

$\sum D^2$ = The sum of students' interval score achievement of pre-test and post-test

$\sum D$ = The sum of students' interval score achievement of pre test and Post-test.

N   = The number of the students

<div align="right">(Arikunto, 2002, p. 306-309)</div>

    e.   Analysis of Effect Size

The next stage is analyzing the effect of the treatment; it is called "Effect Size" (ES). The formula is as follows:

$$ES = t\sqrt{\frac{1}{N}}$$

Where:

ES   = Effect size

t   = test significant

N = number of students

<div align="right">(Cohen, Manion & Morrison, 2007: 521)</div>

The criteria of the effect size can be classified as follow:

Effect Size	Qualification
ES ≤ 0.2	Low
0.2 < ES ≤ 0.8	Moderate
ES > 0.8	High

<div align="right">(Cohen, Manion & Morrison, 2007: 521)</div>

Based on the criteria above, if the effect size of the treatment is more than 0.8, it is categorized as high. It means that the higher of the effect size value, the effectiveness of teaching reading comprehension on narrative text through story mapping has a positive effect to the students' achievement of SMAN 1 Sungai Betung in the Academic Year of 2015/2016. On the other hand, if the effect sizes of the treatment more less than 0.2 it is categorized as low. It means the treatment is has negative effect in teaching reading comprehension on narrative text through story mapping of SMAN 1 Sungai Betung in the Academic Year of 2015/2016.

E. **The Preparation and Implementation of Research**

1. The Preparation of the Research

   After proposing the research design on 30th March 2016, the researcher did some preparation before doing the research in the target school. The preparations include:

   a. Try Out

   The try out was administered on 7th April 2016. The try out was conducted to ensure the reliability and the inner consistency of the pre-test and post-test items. It was given to class X B SMAN 1 Sungai Betung.

2. The implementation of the Research

   a. Pre-Test

The pre-test was given to class X A SMAN 1 Sungai Betung consisted of 25 students. It was held on 11st April 2016. The purpose of pre-test is to know the students pre condition to the narrative.

b. Treatment

The treatment was conducted in two times. Treatment was held on 14 April 2016 and 15th April 2016. The treatment was teaching reading comprehension on narrative text through story mapping.

c. Post-Test

The students had post-test after the treatment, the purpose is to see the students' achievement of the result of teaching reading comprehension on narrative text through story mapping after the treatment was given. The post-test was held on 18th April 2016.