CHAPTER III

RESEARCH METHOD

This chapter present the discussion of research method employed in this study. This chapter covers research design, population and sample of the study, research variable, data source, data collecting method, research instrument, validity and reliability testing, normality testing, data analysis and also hypothesis testing.

A. Research Design

Research design is all needed process in planning and conducting the research. As Nazir (2003:84) states that research design is all process that be needed in conducting research. It is important ways to achieve scientific truth for a research. In other word, it is to answer the research problem through applying of the scientific procedure. In conducting this research needs a plan some steps that will take. Consequently, the design of this research should be suitable for the research condition. For these reason, a researcher has to follow the research design to reach successful in research.

This study is conducted in quantitative research. It determines the relationship between one thing (an independent variable) and another thing (dependent variable) in a population. To achieve the purpose of the study, the researcher took a certain design of the study. The design of this study was belong to Pre Experimental Design with one group pretest − posttest design. This study uses pre experimental because it does not have random assignment of subject to

group or other strategy to control extraneous variable. That is why in this study, the researcher just take one group or class and uses pretest and posttest to see the result of the treatment.

According to Ary (2002 : 22), quantitative research uses objective measurement and statistical analysis of numeric data to understand and explain phenomena. Quantitative research may be further classified as either experimental or non experimental. Experimental research involves a study of the effect of the systematic manipulation of one variable on another variable. Non experimental research called when the researcher identifies variables and may look for relationship among them, but does not manipulate the variables (Ary, 2002:24).

Experimental research design is classified into pre experimental, true experimental and quasi experimental. Pre experimental research does not have random assignment of subject to groups or other strategies to control extraneous variables. Sugiyono (2015:109) explains,

Pre experimental design is not yet really experiment. Because still any other variable which is influence in build the independent variable. So, the result of experiment not because of influence the dependent variable. But happened, because of any control variable and selecting sample not randomly. In the one group pretest – posttest design, a single group is measured or observed not only after being exposed to a treatment of some short, but also before.

Pre experimental design involves administering pre test to the independent variable, applying the experimental treatment to the subjects, and administering the posttest. The result of the treatment is found by comparing the pretest and posttest score. This research used *one group pretest – posttest design*

that consist of pre test, treatment and post test. The pre test and post test are given to take the score of the student's achievement before and after being taught using *mind mapping technique.* After that, both of the score were computed by using t-test to find out whether there is any significant influence of teaching Reading Comprehension in Narrative Text by using *mind mapping technique* or not. Table 3.1 shows the design of One Group Pre Test Post Test.

Table 3.1 The Design of One Group Pre Test Post Test

Pre – Test	Independent Variable	Post - Test
Y1	X	Y2

Explanation :

Y1 = Pre – Test

X   = Treatment

Y2 = Post – Test

The procedures of using One Group Pre – test Post – Test design such as :

1. Administering a pre test by a purpose to measure the reading achievement of 8B class in SMPN 1 Ngantru Tulungagung.

2. Applying the experimental treatment teaching reading comprehension in narrative text material by using *mind mapping technique* to the subject.

3. Administering a post test by a purpose to measure the reading achievement of 8B Class after taught by using *Mind Mapping technique.*

To investigate the effectiveness of Mind Mapping in increasing students' reading comprehension in narrative text, an experimental study would be suitable

to the purpose of the research. Actually, the treatment is aimed at proving whether

the increase scores possibly got. So, the effectiveness of that treatment be known

the significant score when the students taught by using Mind Mapping technique.

B. Population, Sample and Sampling

1. Population

Population and sample are very important part in a study. Sugiyono

(2015:117) states,

> Population is all members of any well-defined class of
> people, events or object. It is a set of units from which the
> researcher will sample. Population is generalized region that
> consist of : object or subject which has specific quality and
> characteristic that chosen by researcher to learned then making
> inference by it.

So, population not only people but also many things in it. It not

only total object or subject that learned, but consist of all characteristic of

that subject or object. The total students in SMPN 1 Ngantru Tulungagung

are 1011 students. According to Ary (2002 : 163) population is all

members of any well defined class of people, events of subjects.

Population of this study was the second year students of SMPN 1 Ngantru

Tulungagung in the academic year 2015/2016 which consists of 12

classes. The total numbers of the students at a second year SMPN 1

Ngantru Tulungagung in the academic year 2015 / 2016 were 346

students.

2. **Sample**

Selecting sample is one of important step in conducting research. Sample can be defined as the smaller part of population. According to Sugiyono (2015:118) sample is part of total and characteristic of that population. If the population is big, the researcher is difficult to choose learned all of that. So the researcher can use sample taken from the population. Sample is a person of population (Ary, 2002 : 163). It means that appropriate sample must be representative of entire as possible. So the sample can representatives as true as population. The sample of this research was B class of second year in SMPN 1 Ngantru Tulungagung. This class consists of 28 students.

3. **Sampling**

In conducting this research, sampling technique is needed to take a representative sample of whole population. Sampling is the process of getting a representative part of the population being studied. According to Sugiyono (2015:118) sampling is a technique to taking the sample. Sampling is also as a way the researcher take select number of individuals. The most important aspect of sampling is that the sample must represent the larger population from which it is drawn. In selecting the sample of the study, the researcher used purposive sampling technique.

Purposive sampling technique is a type of non probability sampling where the researcher consciously selects particular elements or subjects for

addition in a research so as make to sure that the elements will have certain characteristic pertinent to the research. Purposive sampling is sample which is taken because the researcher believe that could give sufficient information. According to Sugiyono, (2015:124) purposive sampling is technique in taking sample by specific consideration. The researcher use purposive sampling by consideration of achievement in English course. Finally choose B class, because appropriate with needed and according to teacher suggestion.

C. Research Variable

Variable is a measurable characteristics that varies. It is the characteristics or attribute of an individual, group, educational system or the environment. According to Ary (2002:39) variable is a construct or a characteristic that can take on different values or scores. In this study the researcher used two variables. They were independent variable and dependent variable.

1. Independent Variable (X)

The independent variable is the variable that refers to how participants are treated. It is variable manipulated by the experimenter. Forte (1984:23) defines an independent variable as the element that the researcher believes may in some way to relate, or influence the dependent variable. This research used teaching reading narrative text by using mind mapping as independent variable.

The treatment is mind mapping technique with purpose to break the problem in class. The researcher taught them by using mind mapping technique. Researcher served story of narrative text and compose it into mind mapping. For example mind mapping in form of tree. Served the branch for orientation, complication and the resolution. This happened until few meeting.

2. **Dependent Variable (Y)**

Dependent variable is the variable which is observed and measured to determine the effect of the independent variable. According to Forte (1984) the dependent variable is the major variable that will be measured or observed to determine how, and if, it is affected by the presence of the independent variable. The dependent variable in this study was students' achievement in reading comprehension of narrative text.

D. Data and Data Source

Data are fact, observations, recordings, or experience or which theory or hypothesis or another research output is based. In other word, data are unit information that can be analyzed and relevant with the problem. In this study, the data are gotten from the students. The data in this study were in the form of score obtained from pre-test and post-test.

E. Data Collecting Method

Data collection is an important aspect of any type of research study. Data collection method is a systematical process or procedure of gathering or collect

data which is needed. The data were collected through pre-test and post-test. During two weeks research, the students followed the treatment. The data of this study were collected by addressing test.

Testing is one way to measure the students' ability. Testing can be defined as a process of giving test. According to Djiwandono (2008) a test is a tool or procedure used to measure the students' language proficiency. The researcher used post test to elicit and collect information on students' reading comprehension after giving a different treatment. In this research, the researcher has planning to give treatment to the students three times in two weeks. Treatment will carry on February 19th, 23th, 26th 2016. The purpose of treatment is to investigate the effectiveness of Mind Mapping Technique in increasing the second graders' Reading Comprehension in Narrative Text of SMPN 1 Ngantru Tulungagung in Academic Year 2015 / 2016."

In will give a test in the form of reading comprehension test. This planning will conduct pre test on February, 19th 2016 post test in the last meeting, because this test will administer after the treatment has been given. The researcher will administered post test on February, 26th 2016 after the treatments. The result of the post test in the form of score will compared with pre-test to get the differences.

F. **Research Instrument**

Research instrument can be defined as a tool or media that used by the researcher to get the data. According to Arikunto (2010) instrument is a media used by the researcher in collecting the data. A research instrument should be

valid and reliable. It is valid if the instrument can measure what will measured. The instruments were used to collect data in order to answer the research question. The instrument of this research is test, namely used reading comprehension test.

Test is a series question, exercise or other means which are used to measure the skill, knowledge, intelligent, ability that have by individual or group (Arikunto, (2010:127). Here the researcher will give a reading comprehension test in the form of multiple choices and T/F test. The researcher used multiple choices items and T/F Test because the scoring can be perfectly reliable and undoubtedly one of the most commonly used type in objective test. Multiple choice test technique has some advantages. The most obvious advantage is that scoring can be perfectly reliable. Scoring should also be rapid and economical.

The question consisted of 15 multiple choices and 5 T/F tests. Those questions included of main idea, explicit meaning, implicit meaning, and also meaning words. In conducting test through many revision in some questions, such as : question no 8 must be clarified because of they are not clear. Question no 9 and 19 must be revised in term of grammar. Question no 10,11,14 and 16 must be revised the clarify of sentences. Whereas question no 1,2,3,4,5,6,7,12,13,15,17,18 and 20 are good. In the last validated with the expert, there are general conclusions such as:

1) The direction of the test must be clear.

2) The instruction of the test must be clear.

3) The duration of the test should be clearly decided.

4) In selecting story text must consider easy and heavy of the plot.

5) In using vocabulary must appropriate with students of Junior High School Level.

6) Short long of the story text have to balance.

7) Better do not take the story from book.

Assessment of this questions is based on totally true and false answer. When students can answer one true answer, so they will get 5 points. So each true answer will gets 5 points and false answer will get zero point. Finally when students can get true answer for all items, they will get excellent point or 100 points. On the contrary, when they do not get no one true answer will get poor value or zero point.

G. Validity and Reliability Testing

Validity and reliability of instrument are integral part in conducting a study since the instrument which will be used must be valid and reliable before using it to collect data in this study. The researcher ensured that the instrument (test) was valid and reliable by doing validity and reliability testing as follows:

1. Validity

Validity is measuring what it is designed to measure. The most complex criterion of an effective test and the most important principle of language testing is validity. According to Lodico, et al (2006:87) state that validity focuses on ensuring that what the instrument "claims" to measure is truly what it is measuring. Validity indicates the instruments' accuracy. A valid test of reading ability actually measures reading ability, not

previous knowledge, nor some other irrelevant variable. Before conducting

the researcher as curtained that the instrument had two kinds of validity as

follows:

a. **Content Validity**

      Content validity is correspondence between curriculum

objectives and objectives being assessed. A test will have content

validity if it includes a proper sample of the structure or content

which is relevant with the purpose of the test. It means the content

must represent the sample of the language skills, structures are being

tested. Moreover, the instrument in this study achieved content

validity since the test was designed based on standard and basic

competence in KTSP since the school implements KTSP curriculum.

Table 3.2 shows the standard and basic competence in KTSP

curriculum.

Table 3.2 Standard Competence and Basic Competence in KTSP Curriculum

Standard Competence	Basic Competence
1.1 Understanding the content of the simple short functional text in the form of recount and narrative text to interact immediate with environment.	1.1.3 Responding the meaning in the written text correctly, accurately and politely related with daily life, to interact with the environment in the form of recount and narrative text.

In this study, material of question in testing using narrative text. It was suitable for the students of the second year in Junior High School, since narrative text is one of some texts that has to be mastered by the students in the second grade of junior high school based on the KTSP curriculum. In addition, before the researcher contributed the test to the subject of the research, the researcher also consulted the instruments related to the question with some teachers who expert in teaching English language especially in reading.

In this case, the researcher made three indicators of the test. They are: (1) find the main idea of narrative text, (2) find the implicit information of narrative text, (3) find the explicit information of narrative text. The indicators stated above will be tested in items of pre test and post test. The first indicator will tested in test item number 3 and 9. The second indicator will tested in the test item number 10, 13, 15 and 18. The last one will tested in the test item number 1, 2, 4, 5, 6, 7, 8, 11,12, 14, 16, 17,19 and 20. From the explanation above, it could be concluded that the test had a content validity.

b.   **Construct Validity**

The construct validity of test when the test is capable of measuring certain specific characteristics in accordance with a theory of language behavior and learning. A test is said to have construct

validity if it can be demonstrated that is measures just the ability which is supposed to measure. Construct validity deals with the relationship between a test and a particular view of language and language learning (Johnson: 2001). The word construct refers to any underlying ability which is hypothesized in a theory of language ability. So, this construct validity is refers to the theory of language learning. Here, the researcher used construct validity in administering reading test based on the form of multiple choice tests by purpose to measure the students' reading comprehension in narrative text.

2. Reliability

Reliability is the consistency of the instrument in producing the same score on different testing occasions or with different raters. According to Lodico, et al (2006: 87) Reliability refers to the consistency of scores, that is an instruments' ability to produce "approximately" the same score for an individual over repeated testing or across different raters. Reliability is concerned with the effect of such random errors of measurement on the consistency of scores. A reliable test is consistent and dependable. If the students are given the same test on two different occasions, the test should yield similar result.

Similar means almost impossible for the test takers to get exactly the same scores when the test is repeated the following day. Therefore, the more similar the score are, the more reliable the test is. Before the pre test

was given, the researcher conducted a try-out for the test to the different subject to know how far the reliability of the instrument. Then the researcher analyzed each item of instrument and computed it by using SPSS 16.0 version. To measure the reliability of the test, Kuder-Richardson Reliability Formula is used. To get Kuder-Richardson reliability, it requires test administration only once. One correct answer is given point five, while incorrect answer is given point zero. The formula is as follow:

$$KR\text{-}20 = \frac{K}{K-1} \left[1 - \frac{\Sigma pq}{s^2} \right]$$

In which:

K= number of items

P = proportion of correct answer for an item

Q = proportion of incorrect answer of an item

S² = variance

The result of that formula showed the reliability of the test with the criteria.

Table 3.3 Criteria of Reliability Testing

The Criteria	The Description
$r < 0.40$	The reliability is low
$0.40 < r \leq 0.80$	The reliability is moderate
$0.80 < r$	The reliability is high

Based on the trying out test that has been done on February, 26th 2016, the result of the test showed the reliability as follow:

$$KR\text{-}20 = \frac{K}{K-1} \left[1 - \frac{\sum pq}{s^2}\right]$$

$$= \frac{20}{20-1} \left[1 - \frac{2.118}{4.438}\right]$$

$$= \frac{20}{19} \left[1 - 0.477\right]$$

$$= 1.052 \left[0.523\right]$$

$$= 0.55$$

The result of the reliability testing was moderate. It means that the test was reliable.

H. Normality Testing

Normality tests are used to determine whether a data set is well modeled by a normal distribution or not, or to compute how normality testing is used to know whether the instrument has normality or not. Normality intended to show that the sample data come from a normally distributed population. To find the normality of the instrument, the researcher used one sample Kolmogrov Smirnov with SPSS.16.

The instrument can be called as has normality if Asymp sig $>$ 0.05, so that Ho (null hypothesis) is accepted and Ha (alternative hypothesis) is rejected. It was also can be concluded as follow:

a. Ho   : The data is in normal distribution

b. Ha : The data is not in normal distribution

The result of normality computed by SPSS 16,0 can be seen as follow:

Table 3.4 Table Normality Using One Sample Kolmogrov Smirnov

One-Sample Kolmogorov-Smirnov Test

		pretest	posttest
N		28	28
Normal Parameters[a]	Mean	85.1786	90.1786
	Std. Deviation	7.63546	7.26256
Most Extreme Differences	Absolute	.205	.247
	Positive	.121	.218
	Negative	-.205	-.247
Kolmogorov-Smirnov Z		1.085	1.305
Asymp. Sig. (2-tailed)		.190	.066
a. Test distribution is Normal.			

Based on table 3.4 above, it showed that the test given to 28 students of B class. It also showed that the value of Asymp. Sig (2-tailed) in pre test was 0.19 and in post test was 0.066 which is higher than 0.05, (0.19 > 0.05 < 0.066). So that it can be concluded that resulted as Ho (null hypothesis) was accepted and Ha (alternative hypothesis) was rejected and also it can be interpreted that has normal distribution.

I. Data Analysis

The purpose of this research was to compare the score of pre-test and post-test at a second year of students SMPN 1 Ngantru Tulungagung. The data were gained from the test, and then the researcher analyzed the data by using SPSS 16.0 version. It was counted to find out the mean, median, and standard

deviation of variable. The procedure of analysis the data both used descriptive and inferential statistic.

a. Descriptive Statistic

After a test is administered, the researcher provided the description of the scores. Then, the researcher examined the descriptive statistic of the test. Descriptive statistic is numerical representation of how a group of students performed on a test (Brown: 1996). The researcher determined the descriptive statistic such as: mean, median and standard deviation.

1) Mean

Mean is probably the single most important indicator of central tendency. The mean is virtually the same with average. It is symbolized in writing by X (said "ex bar"). It is the sum of all data the scores divided by the number of scores.

The formula will be :

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

Notes :

$\sum x$: Sum all of data scores

N : Number of scores

2) Median

The median is value or a number that divided data into two parts. The median is taken to be midway between two middle scores. To get the median the formula is as follows:

$$\text{Median} = \text{Rall} + \left[\frac{1/2N - fkb}{f}\right]$$

Notes:

N   : Number of scores

Rall   : Real Apparent Lower Limit

$\int$: Frequency

$\int$kb   : Frequency lower limit under the mean score class

3) **Mode**

Mode is that score which occurs most frequently. According to Sudjiono (2010) mode is the score that most frequently arises in each data. No statistical formula is necessary for this straightforward idea.

4) **Standard Deviation**

The standard deviation is a short of average of the differences of all scores from the mean. To get it, the formula is as follow:

$$S = \sqrt{\frac{\Sigma(X - \overline{X})^2}{N}}$$

Notes:

S   : Standard deviation

X   : The score

$\overline{X}$: The mean

N : The number of scores

5) **Range**

Range is the number of points between the highest score on a measure and the lowest score. The formula is as follow:

R = H − L

Where :

R = Range, H = High score, and L = Low score

b. **Inferential Statistic**

After got the description of the scores, the researcher used T-test formula. The researcher used T-test to know significant differences of teaching reading by using mind mapping technique at second year of SMPN 1 Ngantru. After collecting the data, the researcher analyzed by using T-test formula states by Sudijono (2010), as follow:

t = $\underline{M1 − M2}$

SEM1 − M2

Notes :

t	: t score / t statistic
M1	: Mean of Pre test
M2	: Mean of Post test
SEM1-M2	: Standard Error of Mean of Difference

J. Hypothesis Testing

The hypothesis of this research was as follow :

1) If T-Test score is bigger than T-table, null hypothesis (Ho) is rejected. It means that there is any difference score to second grade before using mind mapping technique and after using mind mapping technique. The difference is significant.

2) If T-Test score is smaller than T-table, the null hypothesis (Ho) is accepted. It means that there is no different score to second grade before using mind mapping technique and after using mind mapping technique. The difference is not significant.