CHAPTER III

RESEARCH METHOD

This chapter presents the research methodology. It focused the method used in conducting this study. The discussion covers research design, population, sample, sampling and of the research, place and time of the research, variable, data sources of the data, data collecting method and instrument, and the data analysis technique.

A. Research Design

This research used pre-experimental design using quantitative approach with one group pretest-posttest design. This research uses pre-experimental because it does not have random assignment of subject to group or other strategy to control extraneous variable. The researcher uses pre-experimental research because the researcher can't determine the homogeneity of students' writing achievement in MAN 2 Tulungagung. In this research the researcher just takes one group or class to use pre-test and post-test design to know the result of treatment. This research is classified as pre-experimental design because it is little or no control of extraneous variables. In the one group pretest-posttest design, a single group is measured or observed not only after being exposed to a treatment concisely but also before. Pre-experimental research involved administering pre-test to dependent variable, applying the experimental treatment to the subjects, and

administering the post-test. The result of the treatment is comparing in the pretest and posttest score.

In this research that used one group pre-test and post-test design. A pre-test provides a measure on some attribute or characteristic that is assessed in an experiment before the group gets a treatment and a post-test measure on some attribute or characteristics that is assessed for participants in an experiment after a treatment.

The illustration of the research design in this study is as a table below:

Table 3.1 the illustration of research design

Adapted from Ary et al (2010: 304)

Pre-test	Independent	Post-test
Y1	X	Y2

X : treatment using a digital mind mapping

Y1 : students' achievement on writing descriptive text before taught by a digital mind mapping

Y2 : students' achievement on writing descriptive text after taught by a digital mind mapping

The procedures of pre-experimental research that use one group pre-test and post-test design in this study are described:

1. Administering pre-test (Y1) with a purpose of measuring students' writing descriptive text before applying treatment.

2. Applying experimental treatment teaching writing descriptive text by using a digital mind mapping (X).

3. Administering post-test (Y2) with a purpose of measuring students' writing descriptive text after applying treatment.

This research intended to investigate the effectiveness of use digital mind mapping to improve student's achievement of writing descriptive text at the first grade of MAN 2 Tulungagung in academic year 2015/2016. The use of treatment is aimed at proving whether the increase score possibly got by the researcher. Thus, the effectiveness of that treatment will know the significant score when the student taught using a digital mind mapping.

B. Population, Sample and Sampling

1. Population

There are some explanations about the meaning of population. According to Ary el al (2010: 148) population is all members of well-defined class of people, events, or objects. And Muijs (2004:15) says that the population is the group of people we want to generalize to. It means that the population is the whole of subject used by the

researcher. The population in this research is the first year students of MAN 2 Tulungagung academic year 2015/2016. There are eleven classes and every class there are 35 - 44 students in each class. The total number of the population is 425 students.

Table 3.2 Population of the research

No.	Class	Total
1.	X-Agama	42
2.	X-Bahasa	41
3.	X-MIA 1	35
4.	X-MIA 2	35
5.	X-MIA 3	33
6.	X-MIA 4	44
7.	X-MIA 5	44
8.	X-IIS 1	32
9.	X-IIS 2	32
10	X-IIS 3	44
11.	X-IIS 4	43
		425

2. Sample and Sampling

Sample in this research is very important to represent all of population. According to Ary et al (2010: 148) a sample is a portion of a population. It means that sample is smallest part from population. The Sample in this research is student of X-MIA 1 class consists of 35 students.

In this research the researcher used non-probability sampling type purposive sampling technique. In purposive sampling, also referred to as judgment sampling, sample elements judged to be typical or representative are chosen from the population (Ary et al, 2010:156). As the process of sampling, the researcher finally decided to choose X-MIA 1 class consists of 35 students by considering some factors:

1. In order to apply the experimental stage need gadget especially laptop, in X-MIA 1 class almost every student has laptop.
2. X-MIA 1 class was recommendation of an English teacher that handles first grade students' of MAN 2 Tulungagung.

C. Research Instrument

The instrument use in this research is tests. Ary et al (2010:201) says that test is a set of stimuli presented to individual in order to elicit responses on the basis of which a numerical score can be assigned. In this research, there are two types of test. They are pre-test and post-test. The researcher use pre-test to measure the student's achievement in writing achievement before the treatment given, and post-test to measure students' writing achievement after the treatment given. The test in this research is a prompt test to write descriptive text using some criteria which is explained clearly in the paper of student task. There are some criteria for student to write descriptive text such as: content of the text should relevant, organization, grammar, vocabulary and mechanics. The researcher also use scoring rubric to scoring the student's writing achievement.

In this research, the researcher applied pre-test and post-test. The test is in given in form of prompt test that ask to student to write descriptive text about description of someone especially their family or friend. The pre-test was given before the researcher applied the treatment. The treatment is about writing descriptive text using digital mind mapping. The researcher was given the pre-test by give the task during 30 minutes on February 6, 2016. Next, on February 13, 2015 the researcher gives the treatment during 90 minutes. On February 20, 2015 the next treatment is given on the second meeting during 90 minutes. Then on February 27, 2015, the researcher is given the last treatment about digital mind mapping to students and in the same day the researcher is done the post-test to student to know the students' achievement is writing descriptive text using digital mind mapping.

The scoring for the tests was based on the rating scale scoring rubric.

Table 3.3 Scoring Rubric of Descriptive Text
Adapted from Brown (2007)

Aspect	Score	Performance Descriptive
Content (C) 30 % - topic - detail	4	The topic is complete and clear and the details are relating to the topic
	3	the topic is complete and clear but the details are almost relating to the topic
	2	the topic is complete and clear but the details are not relating to the topic
	1	the topic is not clear and the details are not relating to the topic
Organization (O) 20 % - identification - description	4	Identification is complete and descriptions are arranged with proper connectives
	3	Identification is almost complete and descriptions are arranged with almost proper connectives
	2	Identification is not complete and descriptions are arranged with few misuse of connective
	1	Identification is not complete and descriptions are arranged with misuse of connectives
Grammar (G) 20 %	4	Very few grammatical or agreement inaccuracies
	3	Few grammatical or agreement inaccuracies but not effect on meaning
	2	Numerous grammatical or agreement inaccuracies
	1	Frequent grammatical or agreement inaccuracies
Vocabulary (V) 15 %	4	Effective choice of words and word forms
	3	Few grammatical or agreement inaccuracies but not effect on meaning
	2	Limited range confusing words and word forms
	1	Very poor knowledge or words, word forms, and not understandable
Mechanics (M) 15 % - Spelling - Punctuation - Capitalization	4	It uses correct spelling, punctuation and capitalization
	3	It has occasional errors of spelling, punctuation and capitalization
	2	It has frequent errors of spelling, punctuation and capitalization
	1	It is dominated by errors spelling, punctuation and capitalization

$$\text{Score} = \frac{3C+2O+2G+1{,}5V+1{,}5M}{40} \text{ x } 10$$

D. Validity and Reliability Testing

In this study, the researcher used a test as the research instruments. Both pre-test and post-test were intended to measure students' writing achievement. The tests should fulfill some factors to get the data as well. The factors tested here are validity and reliability of the tests. By using a valid and reliable instrument to collect data, it was expected that the data and the result of the research itself also valid and reliable.

1. Validity Testing

Validity is the most important consideration in developing and evaluating measuring instrument. Muijs (2004: 66) defines validity is probably the single most important aspect of the design of any measurement instrument in educational research. In other words, validity can be defined as the instrument that measures what is supposed to be measured. In this study, to ensure tests validity the researcher used content validity and face validity.

a. Content validity

Content validity refers to whether or not the content of the manifest variables (e.g. items of a test or questions of a questionnaire) is right to measure the latent concept (self-esteem, achievement, attitudes,…) that we are trying to measure, Muijs (2004: 66).

In this test, the researcher gives the written test to measure students' achievement in writing descriptive text. Therefore, this test is

valid in terms of the content validity. In this study the use of content validity because the result of test can be representative of the student for entire course material that has been taught. In order to judge whether or not the test has content validity, we need a specification of the skills or structure being tasted. The instrument of this research had a content validity because of the design from the syllabus of students in MAN 2 Tulungagung in academic year 2015/ 2016.

The content validity in this research can be shown as below:

Table. 3.4 content validity

Basic Competence	Indicator	Task Form	Scoring criteria
4.10. Menyusun teks deskriptif lisan dan tulis sederhana tentang orang, tempat wisata, dan bangunan bersejarah terkenal, dengan memperhatikan tujuan, struktur teks, dan unsur kebahasaan, secara benar dan sesuai dengan konteks.	4.10.2. Menulis ciri-ciri subjek yang berisi tampilan fisik, kualitas, perilaku umum, sifat-sifat seseorang yang akan dideskripsikan.	Prompt task	➢ Content : topic and detail of paragraph ➢ Organization : identification and description object ➢ Grammar : use simple present tense ➢ Vocabulary choices. ➢ Mechanics: spelling, punctuation, capitalization

b. Face Validity

A test is said to have face validity if it measures what is supposed to measure. According to Ary et al (2010: 228) face validity is a term sometimes used in connection with a test's content. The example of face validity, a test which pretended to measure student's ability in pronunciation but which did not require the test-taker to speak might be thought lack face validity.

The researcher uses face validity in this research by consulting with expert and teacher. Sheet validator can be seen in appendix. And then this test has some aspect that makes it reliable in the aspect of face validity, such as;

1. The instruction must be clear and understandable for the students
2. In this test, the students can conduct a paragraph and express their ideas in a piece of paper. The instruction based on syllabus and suitable with their level.
3. Time allocation must be sufficient. The teacher give limited about 30 minutes to write a paragraph.

2. Reliability testing

Reliability of a test can be derived from reliability coefficient. Ary et al (2010:236) defines the reliability as the degree of the consistency with which an instrument measures whatever it is measuring. According Brown (2004:20) 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. Reliability is the characteristic of very good test for it to be valid. Reliability of the test is the measurement that explains the consistency of the test. The test is consistence if those tests have the same relative score although examined frequent. In this study, the researcher used prompt test as an instrument to measure the student achievement in writing. The researcher wants to know the reliability of the test before the researcher applied the instrument into the experimental and control class. So, the researcher applied the tryout of instrument and chose X-MIA 5 class as a tryout class. In X-MIA 5 class, the researcher doing the test before the researcher applied into control and experimental class. Researcher analyzes the reliability of the instrument in the aspect of the score that the student have. The instrument is said reliable if the first scorer and the second scorer have the similarity of scoring or not very different from giving the score of student test. The students' score from first and second scorer in this case afterwards is used in statistical coefficient to analyze the reliability using SPSS Statistics. In this study, the researcher uses inter-rater reliability, where the researcher invites other scorer to scoring student's achievement in writing. The researcher searches other English teacher that has the understanding about writing descriptive text. After the researcher and second rater scoring students' writing next, that two score is compare to know the reliability of

coefficient. Then, two sets of scores are calculated using Pearson Product Moment in SPSS Statistics 18 for getting correlation coefficient. The result of correlation coefficient from two score afterwards will be made the indicator of the instrument. The score of students in writing descriptive text from researcher scorer and second scorer is used to know the reliability of instrument. The consistency of students' score from two scorers is indicating that this test was reliable and certainly can be used as an instrument of the research. The range of reliability coefficient is 0-1. In this case, 0 means not reliable while 1 means perfectly reliable. The criteria of reliability's degree can be seen on Table below, than the reliability's result can be seen in appendix.

Table 3.5 Correlations of Pre-test (tryout)

Correlations

		VAR00001	VAR00002
VAR00001	Pearson Correlation	1	.947**
	Sig. (2-tailed)		.000
	N	15	15
VAR00002	Pearson Correlation	.947**	1
	Sig. (2-tailed)	.000	
	N	15	15

**. Correlation is significant at the 0.01 level (2-tailed).

Based on the computation of the Pearson Product Moment in tryout of pre-test the value is 0.947, it is bigger than r table that is 0.514, so we can conclude that the pre-test of tryout is reliable.

Table 3.6 Correlation of post-test (tryout)

Correlations

		VAR00003	VAR00004
VAR00003	Pearson Correlation	1	.806**
	Sig. (2-tailed)		.000
	N	15	15
VAR00004	Pearson Correlation	.806**	1
	Sig. (2-tailed)	.000	
	N	15	15

**. Correlation is significant at the 0.01 level (2-tailed).

Based on the computation of the Pearson Product Moment in tryout of pre-test the value is 0.806, it is bigger than r table that is 0.514, so we can conclude that the pre-test of tryout is reliable.

E. Normality Testing

The normality test is used to know whether the data is normally distributed or not. Normality test is intended to show that the sample data come from a normally distributed population.

To know the normality, the researcher used *kolmogorov-smirnove test* with SPSS. The hypothesis for testing normality are:

a. H_0 : Data is in normal distribution

b. H_a : Data is not in normal distribution

H_0 was rejected when the significance value was lower than 0.05 (α = 5%). The analysis was as follow:

Testing data from pre-test and post-tets score using SPSS 18.00

Table 3.7 One Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test

		Nilai_Pre Test	Nilai_Post Test
N		35	35
Normal Parameters[a,b]	Mean	52.5357	64.7500
	Std. Deviation	8.36597	5.14317
Most Extreme Differences	Absolute	.117	.104
	Positive	.117	.098
	Negative	-.112	-.104
Kolmogorov-Smirnov Z		.690	.613
Asymp. Sig. (2-tailed)		.728	.847

a. Test distribution is Normal.
b. Calculated from data.

From the SPSS output was known that the significance value pre-test was 0.728 and the post-test was 0.847. Both value from pre-test and post-test were bigger than 0.05. The sig/P value on pre-test was 0.728 and it was bigger that 0.05 (0.728 > 0.05). In other word that H_0 was accepted and H_a

was rejected and the data was in normal distribution. Then, for post-test score the value of sig/ P was 0.848 and that was bigger than 0.05 (0.847 > 0.05), it means that H_0 was accepted and H_a was rejected and the data was normal distribution. So, it could be interpreted that both of data (pre-test and Post-teast score) were in normal distribution.

F. Data Collection Method

The data collecting method and the instrument were needed to obtain the data in the research. Data collection method is the method to obtain the data in the research. The researcher collects the data from the score of pre-test and post-test in writing descriptive text. The researcher gives the pre-test to know student's writing achievement in descriptive text without using digital mind mapping. After the researcher get score from pre-test, the researcher apply digital mind mapping in doing writing descriptive text. Next, the researcher gives post-test to the students. The result of pre-test and post-test then researcher compares using SPSS 18 to know the affectivity. The technique of collecting data can be shown as:

1. Pre-test

Researcher gave pre-test before the treatment, pre-test refers to a measure or test given to the subject prior to the experimental treatment. The researcher came to the X-MIA 1 class, then review about descriptive text. In the pre-test of writing descriptive the researcher asked the students to write description of someone, especially about their family or friends. Time allocation of the test is 30 minutes. The purpose of pre-test

is to get information how far the student's achievement in writing descriptive text before taught using digital mind mapping.

2. Post-test

The researcher does post-test after giving the treatment in experimental research or after teaching writing by digital mind mapping. In the post-test of writing descriptive the researcher asked the students to write description of their idol. Time allocation of the test is 30 minutes. The post-test in this research has purpose to observe and measure any changes of the students writing descriptive after being taught by digital mind mapping. The post-test is important to get writing score of students after doing the treatment.

G. Data Analysis

The researcher used quantitative data analysis in managing and analyzing the data collected. It's mean that the researcher will analyze the data by using statistical technique. The purpose of this analysis to find the significant difference of the students' achievement in writing descriptive text before and after teaching using digital mind mapping. The researcher is used the application SPSS Statistics 18 for windows to analyzed Paired-Sample T-test. The researcher uses Paired-Sample T-test because in this research just takes one group or class to use pre-test and post-test.

There are some steps in analyzing data in SPSS 18. Firstly, the researcher input the data in SPSS Statistics to know the frequency of pre-test

and post-test score. Next, by using this application the researcher know the mean, median, mode and standard deviation. Then, from the compare of data the researcher know the pair sample statistics and finally the researcher find pair sample correlation from two kinds of test. The researcher cans analysis about the result of significant two tails and degree of freedom. After the researcher knows the result of significant two tails from SPSS Statistics, the researcher can give the conclusion about the effectiveness or not about the treatment digital mind mapping in writing descriptive text. This strategy is used to find the significant different on the students writing descriptive text using digital mind mapping. If the significant two tails is smaller than the level of significant (0.05), the alternative hypothesis (ha) is accepted. It means that, there is different score of students' achievement before and after taught using digital mind mapping. On the other hand, if the significant two tails is bigger than the level of significant (0.05) the null hypothesis is rejected. Indicating that, there is no different score of students' achievement before and after taught using digital mind mapping.

H. Research Procedure

The procedure of pre experimental research that use one group pretest and posttest design as follow:

1. The researcher administer a pre-test with a purpose to measure students' writing achievement in writing descriptive text before taught using digital mind mapping. In the pre-test of writing

descriptive the researcher asked the students to write description of someone, especially about their family or friends. Time allocation of the test is 30 minutes

2. The researcher gives the experimental treatment in teaching writing descriptive text using digital mind mapping to student. There are some steps in giving treatment in the classroom. Those are:
    a. Introduce about digital mind mapping strategy
    b. Download and share application of digital mind mapping
    c. Install application of digital mind mapping
    d. Guide the students to make a map using digital mind mapping and then write describing based on map.
    e. The students to make a map individually about their idol using digital mind mapping.
    f. The last procedure, every student writing describe about their idol based on the

3. At the last, the researcher administering the post-test with a purpose to measure students' writing achievement in descriptive text. In the post-test of writing descriptive the researcher asked the students to write description of their idol. Time allocation of the test is 30 minutes.