CHAPTER III

RESEARCH METHOD

This chapter presents the research design of the study, population and sampling, research instrument, data collection, and technique of data analysis.

3.1. Research Design

Based on the research objective, this study investigated the effect of Smartphone Smartphone E-Mind Mapping strategy on the students' reading ability and motivation. To answer the research questions, the study used a factorial quasi-experimental design two group pre-test and post-test. Based on Ary, Jacobs, and Razavich (1979) the research design of the study can be summarized as follows:

Group	pre-test	independent variable	post test
E	Y1	X	Y2
C	Y1	-	Y2

Where:

E : experimental group

C : control group

Y1 : represent pre test

Y2 : represent post test

In this case, the researcher took the existing classes, they are XI MIPA 4 and XI MIPA 5 since the classes get four hours a week for English, two hours for compulsory English (Bahasa Inggris wajib), the rest for elective English (Bahasa Inggris Lintas Minat).

At the beginning of the experiment, the subjects were given a pre-test to investigate the initial reading comprehension ability. The pre-test was also intended to classify the students into low and high achieving students. It was because the researcher wanted to know the effects of the treatment by using Smartphone Smartphone E-Mind Mapping on the small scope of the subject. The researcher also gave questionnaire to the students after the treatment to know the students' motivation after they were taught using Smartphone Smartphone E-Mind Mapping.

3.2. Population, Sampling and Sample

The population of this research was the eleventh grade students of MAN 1 Tulungagung. In this case, the researcher chose two classes as the sample. One class was for experimental group and the rest was control group. In choosing the subject, the researcher used purposive sampling. The researcher chose class XI MIPA 4 and XI MIPA 5 as the subject of this study since the classes get four hours a week for English, two is compulsory English and the other is elective English (Bahasa Inggris Lintas Minat). In addition, they had the same average score. In this occasion, the researcher took the elective English. It was shown by their English score. It indicated that the two classes have the same mean score of

their last semester score. XI MIA 4 had average score 70.6, while XI MIA 5 had 70.9. In deciding the experimental and the control group, the researcher used lottery. Based on the result of the lottery, XI MIA 4 was the control group and XI MIA 5 was the experimental group. The complete score can be seen in the appendix 1.

3.3. Research Instrument

Since this research was intended to investigate the effect of Smartphone E-Mind Mapping on the students' reading comprehension ability and motivation, the researcher used reading test and motivation questionnaire as the research instrument.

3.3.1.Reading Test

To measure the students' reading achievement, a reading test was administered to the students. The researcher constructed the reading test consisting of 25 items of objective test. The test was given to experimental and control groups. Experimental group was taught by using Smartphone E-Mind Mapping, while control group was taught by using non Smartphone E-Mind Mapping. In relation to the English syllabus for eleventh grade of Senior high school, the researcher provided one text type, which was hortatory exposition text. It included material of elective English for second semester in the eleventh grade.

3.3.2. Developing and Constructing a Test

In constructing test items, the writer took one text type from syllabus for second semester. In second semester, there is only one reading text type. The text was hortatory exposition text. The text was unseen text. It meant that the teacher hadn't given the reading text in the class. So, the students accepted the new reading materials. By giving new texts, the researcher was able to measure the real performance of their reading comprehension ability.

3.3.3. Validating The Test

The researcher validated both the construct and content validity. The construct validity is the validity concerned with the theoretical construct. The test is regarded to have construct validity if the items of the test measure each of thinking aspect from the variable. While content validity is related to the coverage of materials will be measured and the materials are covered in the syllabus.

Moreover, validating the construct validity was done by analyzing the objectives of the test and the type of the test in which the students were asked to do the task. In this case, the researcher gave reading test since the researcher wanted to measure the students' reading ability. After reading the text, the students were asked to answer the questions measuring their comprehension achievement. The evidence of construct validity can be seen in the following table.

Table 3.1. Table of Construct validity of reading test

Objective of the test	type of test	Task
Measuring the students' reading comprehension	reading comprehension test	students are asked to answer the reading comprehension questions

On the other side, content validity is concerned with the coverage of the materials being tested. Validating content validity is done by analyzing the content of the test and the materials required in English syllabus of the eleventh grade. The purpose of analyzing is whether the content of the test represent the reading materials in English syllabus.

The description of the test items used in the reading comprehension test can be clearly seen in the following table.

Table 3.2. Table of description of test item

Objective of the test	Types of comprehension	Specific objective	Number of question	Item number
To evaluate students' reading	Literal comprehension	• Finding specific information	10 5	4,6,9,10,13,14,15,16,17,24

comprehension of the text they read		• Finding synonym • Finding reference	2	7,11,18,20,23 8,19
	Inferential comprehension	• Determining generic structure • Finding main idea • Finding the purpose of the text • Finding the topic	2 3 2 1	1,21 2,12,25 3,22 5

3.3.4. Trying Out Test

Before conducting the test, the researcher had tried out the test to get the evidence whether the test can be used as the research instrument or not. The result of the try out test was used to check the item difficulty, the item discrimination, and the reliability of the test. The researcher chose the students who have learned hortatory exposition text.

In conducting try out, the researcher chose the students who had already learned reading material of hortatory exposition text for eleventh grade.

Therefore, the students of the tried out test were at least those who had got hortatory exposition text before. Based on the consideration, the researcher chose students of XI MIPA 2 as the subject of the try out. The try out was conducted on 22nd of February 2019.

3.3.5. Analyzing the result of the try out

In analyzing the try out test here, the researcher used item analysis. This was conducted to obtain a reliable research instrument. The result of the analysis was used to make revision. Brown (1996) stated that item analysis is the systematic evaluation of the effectiveness of the individual item of a test. Analyzing is conducted to obtain the good test items or to revise the items. Analyzing was carried out in terms of item difficulty, item discrimination, analysis of distractors, and the reliability index of the test result.

3.3.6. Item Difficulty of the test

The good test item is the item which is not too easy or difficult. Too easy test item can't encourage the students to solve it. Too difficult test item causes the students reluctant to finish it since it is beyond their ability. Good test item is test item which has moderate criteria. Item difficulty which is often called item facility or facility of the test is a statistical index used to get the percentage of the test items which is correctly answered by the students. The percentage indicates the category level of the test items. Djiwandono (2008) explains that counting the reliability can be done through prediction of the number of test item,

the average score and standard deviation. To get the reliability of the test, the researcher determined the difficulty level. It is the division of the number of correct answer and the number of test takers. The formula is as follows:

$$P = \frac{\text{the number of correct answer}}{\text{The number of test takers}}$$

(Djiwandono,2008:219)

Based on the result of the computation and distractor analysis, there were some test items that should be revised. They were changed based on the consideration that those test items were too easy, too difficult, and the options in the test items don't function well since they were not chosen by the test takers. The followings are the test items that were changed: item number 2,5,7,8,9,10,24. The item difficulty computation completely is described in appendix 3.

3.3.7. The Reliability of The Test

Reliability is one of the characteristics of a good test. Reliable test is the test which can give consistent result. It means that the test have the same result when it is given to any different situations. Reliability measures the consistency of the test. That's why in this study, the test which is used as the instrument of the research must be reliable. In this case, the researcher used SPSS reliability analysis to determine the reliability of the test. The complete

computation on reliability of on the reliability of the test can be seen in Apendix 4. The result of the reliability of SPSS computation is 0.68. based on the calculation, it shows that the reliability of the test is considered adequate in term of correlation. The coefficient correlation is shown in the following table.

Table 3.3. Table of the coefficient correlation of the reliability of the instrument

Coefficient	Level of correlation
0.80 – 1.00	high
0.60 – 0.79	adequate
0.40 – 0.59	fair
0.20 – 0.39	low
0.00 – 0.19	Very low

(Djiwandono, 2008)

3.3.9. Revising the test item

The final step of constructing the reliable test is revising the items of the test based on the result of analysis test items. Reliable instrument will produce reliable data. Therefore, analyzing test items was important step before revising the test items. The purpose of revising test items is that is to get the valid and reliable test items in order to get the valid and reliable data. Because of limited time, the revision test was not tried out again and it was directly used for post- test.

3.3.10. Constructing Motivation Questionnaire

The questionnaire is adapted from Dr. Allan Wigfield and Dr. John Guthrie (1997). The questionnaire is called motivation for reading questionnaire (MRQ). The motivation for reading questionnaire is a student rated assessment of the extent to which each student is motivated to read. It is to assess different aspects of student's reading motivation.

MRQ questionnaire consists of three categories which entail eleven sub-components. The first category is competence and reading efficacy. This category entails three sub-components. They are reading efficacy, reading challenge and reading work avoidance. The second category is achievement value and goals. It consists of intrinsic motivation and extrinsic motivation. Intrinsic motivation involves reading curiosity, reading involvement, and importance of reading, while extrinsic motivation is divided into competition in reading, reading recognition, and reading for grades. The last category is social aspect aspects of reading. It entails social reasons for reading and reading compliance.

In this case, the researcher used 36 items developed by Wigfield and Ghutrie (1997) as the instrument in this study to find out whether smartphone e-mind mapping influence the students' reading motivation. The items in this questionnaire were constituted using four-point Likert scale (1= strongly disagree, 2= disagree, 3= rarely agree, 4= agree, 5 = strongly agree). The items of the questionnaire were translated into Indonesian to make it easy to understand (see appendix 6). Thus, the students can fulfill the questionnaire

easily and effectively. In this study, the questionnaire was validated by the users, that is the students of eleventh grade of MAN 1 Tulungagung. The user validation was conducted in XI IPS 4 on 23rd of February 2019.

After the process of validation, the researcher revised the questionnaire based on the result of validation. The statements of questionnaire had not in the table. Beside each statement, there had been number 1 up to five representing the category. The category had been written above the statement list. It had made the students confused to choose the answer. Based on the result of the user' validation, the questions in the questionnaire were easily understood by the students, but the lay out was not interesting and made them boring. It should have been in the form of table. Therefore, the researcher changed the layout of the questionnaire. The researcher also put the category beside each statement instead of numbers representing it.

3.4. Data collection

The data of this study is in the form of score is representing the students' achievement in reading ability and the scores of students' motivation. The researcher will conduct pre-test and post-test to both of the groups. The pre-test is used to examine the initial mastery of students' reading ability for both of the groups before the treatment and to know whether the experimental and control groups are statistically comparable. It is also to classify the low and high achieving students. After that, the researcher will conduct the treatment that is experimental group will be given Smartphone E-Mind Mapping strategy

and the control group will be taught by using non Smartphone E-Mind Mapping strategy.

The next step is administering the post-test and questionnaire of motivation for both groups. The post- test items were different from the pre-test ones. The score of post-test and the result of the questionnaire will be a clear picture of the research problem which needs the answers as whether Smartphone E-Mind Mapping strategy is effective in improving students' reading comprehension and motivation.

To get plan of the research, the researcher arranged the schedule of research. It was in the following table.

Table 3.4. Table of Schedule of collecting the data

Group	March	April	May
Experimental	Pre-test	Teaching learning activity by using smartphone E-Mind Mapping	Post-test and completing questionnaire
Control	Pre-test	Teaching learning activity by using smartphone E-Mind Mapping	Post-test and completing questionnaire

3.5. Technique of Data Analysis

To prove the hypothesis of the research, the researcher analyzes the data statistically using SPSS. For analyzing the mean score of reading test, and

motivation, the researcher uses Manova. Manovas is the abbreviation of multivariate of Anova. According to Yuli (2015) Manova is the statistical analysis to explore the relation among some independent variables which has categorical and dependent variables which is nominal or ordinal data. Manova is used to test whether there is the real differences of some dependent variables towards one independent variable (Santoso:2018). The purpose of MANOVA is to know whether there is real difference of dependent variables among the members (independent variable).