CHAPTER IV

RESEARCH FINDING AND DISCUSSION

This chapter presents the result of analysis of the data collected in this study. To obtain sufficient answer of the research problem stated in chapter 1, the researcher applies Manova in order to find the different means of reading comprehension and motivation between the experimental and control group after being treatment during six meetings. The researcher also would like to find the different means of reading comprehension and motivation between the low and high achieving students both in experimental and control groups.

4.1. Research Findings

The discussion of the findings of this study is divided into three phases: (1) the result of analysis of Manova in order to know the mean difference of reading test and motivation from experimental and control groups, (2) the result of analysis of Manova in order to know the difference of mean of reading test and motivation of the high achievers from experimental and control group, (3) the result of analysis of Manova in order to know the mean difference of reading test and motivation of low achieving of experimental and control groups.

The hypothesis of the study is: "there is significant difference on mean score of reading comprehension and motivation between the students who are taught using smartphone e-mind mapping and the ones who are taught using non e-mind mapping". The null hypothesis is conversely formulated as follows: "there

is no significant difference on mean score of reading comprehension and motivation between the students who are taught using smartphone e-mind mapping and the ones who are taught using non smartphone e-mind mapping"

4.1.1. The Result of Manova for Reading Comprehension and motivation of Experimental and Control Groups

After conducting calculation of all data collected, it was found that mean score of reading test from experimental group was 65.03, while control group had 64. Data analysis used in this research was Manova since it would like to find out the effect of independent variable that is smartphone e-mind mapping on more than one dependent variables; they are reading comprehension and motivation. The researcher used SPSS in analyzing the data. The, the result of analysis can be seen in the following table;

Table 4.1. Table of Manova analysis of experimental and control group

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	reading	16.245[a]	1	16.245	.058	.811
	motivation	2662.075[b]	1	2662.075	13.218	.001
Intercept	reading	253833.950	1	253833.950	901.802	.000
	motivation	952467.255	1	952467.255	4.729E3	.000
strategy	reading	16.245	1	16.245	.058	.811
	motivation	2662.075	1	2662.075	13.218	.001
Error	reading	16606.968	59	281.474		
	motivation	11882.515	59	201.399		
Total	reading	270592.000	61			
	motivation	968920.000	61			

Corrected Total	reading	16623.213	60			
	motivation	14544.590	60			

a. R Squared = .001 (Adjusted R Squared = -.016)

b. R Squared = .183 (Adjusted R Squared = .169)

The result of data analysis shows reading test and motivation questionnaire, it can be seen that the sig value of reading comprehension was 0.811. It was bigger than 0.05. So, H0 is accepted and H1 is rejected. It can be concluded that smartphone e-mind mapping doesn't affect reading ability of the students. On other side, sig value of students' motivation was 0.01. It was smaller than 0.05. Therefore, H0 is rejected and H1 is accepted. It means that smartphone e-mind mapping gives significant effect on the students' motivation.

So, it can be inferred that there is no different mean of reading comprehension ability between the students who are taught by using smartphone e-mind and the students who were taught by using non smartphone e- mind mapping. In other words, smartphone e-mind mapping doesn't give significant effect on students' reading comprehension ability. However, there is different motivation mean score between the students who were taught by using smartphone e-mind mapping and the students who were taught by using non smartphone e-mind mapping. It also can be said that smartphone e-mind mapping gives significant effect on students' motivation.

4.1.2. The Result of Manova for Reading Comprehension and motivation of High Achieving students of Experimental and Control Groups

The objective of this present study as stated in chapter one is to find out whether there is significant difference of reading comprehension and motivation between high achieving students of experimental group and the ones in the control group. Manova is used to analyze the data. The data is presented in the following table:

Table 4.2. Table of mean score of reading comprehension and motivation of high achieving students

Group	Number of students	Mean of reading test	Mean of motivation score
Experimental	5	91.2	144.8
Control	5	87.2	112.8

The result of Manova computation showed that the sig value of reading comprehension ability was 0.095. The value was bigger than 0.05. So, H0 is accepted and H1 is rejected. It can be concluded that smartphone e-mind mapping doesn't give any affects reading ability of the students. On other side, the sig value of students' motivation was 0.012. It was smaller than 0.05. Therefore, H0 is rejected and H1 is accepted. It means that smartphone e-mind mapping gives significant effect on the high achieving students' motivation. The result can be seen in appendix 12.

In conclusion, there is no difference on the mean score of reading comprehension of the high achieving students who were taught by using smartphone e-mind mapping and the ones who were taught by using non smartphone e-mind mapping. However, there is significant difference of motivation score between the high achieving students who were taught by using smartphone e-mind mapping and the high achieving who were taught by using non smartphone e-mind mapping.

4.1.3. The Result of Manova for Reading Comprehension and motivation of Low Achieving students of Experimental and Control Groups

The research is also intended to find out whether there is difference on the mean score reading comprehension of low achieving students who were taught by using smartphone e-mind mapping and the students were taught by using non smartphone e-mind mapping. Besides, it is also to know whether there is difference of motivation score between the students who were taught by using smartphone e-mind mapping and the ones who were taught by using non smartphone e-mind mapping. The following table presents the data of the mean score of reading comprehension and motivation score of low achieving students from the two groups.

Table 4.3. Table of mean score of reading comprehension and motivation of low achieving students

Group	Number of students	Mean of reading score	Mean of motivation score
experimental	5	38.4	122.6
Control	4	31	104.5

In analyzing the data, Manova of General Linear model was used. The result of SPSS calculation showed that the sig of reading comprehension was 0.092 and sig of motivation was 0.027. It can be inferred that the sig value of reading was higher than 0.05. It means that H0 is accepted. The conclusion is that there is no means difference on reading comprehension between the students who are taught by using smartphone e-mind mapping and those who were taught by using non smartphone e-mind mapping. While the sig value of motivation was 0.027. This value was less than 0.05. Thus, H0 was rejected and H1 was accepted. It means that there is a different mean of motivation between the students who were taught by using smartphone e-mind mapping and the ones who didn't get smartphone e-mind mapping.

4.2. Discussion

As it has been mentioned in chapter 1, the objectives of this study is to find the answer of the problem that is "do the students taught by using smartphone

e-mind mapping strategy perform better in reading comprehension and motivation than the students taught by using non e-mind mapping?" after reviewing some theories concerning with the topic of this study, the operational hypothesis as formulated that the students who are taught by using smartphone e-mind mapping perform better achievement in reading comprehension and motivation than the students who are taught by using non e-mind mapping. To make an easy step to analyze the data, the null hypothesis is given. The null hypothesis said that the students' achievement of reading comprehension and motivation after being taught by using smartphone e-mind mapping is not significantly better than those have been taught by using non smartphone e-mind mapping.

4.2.1. The different mean of reading comprehension and motivation between control group and experimental group

After conducting calculation of all data collected, it was found that the mean score of reading comprehension of the experimental group was 65.03 while the mean score of reading comprehension of the control group was 64. It can be inferred that after having been trained for about three meetings or six periods of lesson by applying smartphone e-mind mapping, the experimental group did not perform better in reading comprehension than the control group did.

In addition, by applying Manova, it can be seen that the score of the motivation of the experimental group was 131.580645 and the control group was 118.3666667. The result of Manova analysis revealed that the sig value of reading comprehension was 0.811 while the sig value of motivation was 0.01 with level of significance of 0.05. It can be concluded that the sig value of reading comprehension is

higher than 0.05, while the sig value of motivation is less than 0.05. It can be said that null hypothesis which states that there is no significant difference on mean score of reading comprehension between experimental group and control group was accepted. While the null hypothesis which stated that there is no significant difference on the mean score of motivation of the students who were taught by using smartphone e-mind mapping and the students who were taught by using non smartphone e-mind mapping was rejected. In other words, smartphone e-mind mapping gives significant effect on the students' motivation. However, this strategy does not give any significant effect on the students' reading comprehension.

The result of the analysis for reading comprehension showed that although the mean score of reading comprehension of the experimental group was higher than the mean score of the control group, the Manova analysis indicated that smartphone e-mind mapping doesn't give any effect of the students' reading comprehension. This research finding is in line with Maslakhatin (2015) who conducted a comparative study of the use of mind mapping and pre-questioning in teaching reading comprehension. In her study, she found that there was no significant difference between the students who were taught using mind mapping and pre-questioning.

On the other hand, the research finding is contradictory with Rizqiya's study (2013). She argues that mind mapping is a good technique to teach reading comprehension. She also explains that mind mapping succeed in improving students' reading comprehension since the students relate between what they wrote in their mind mapping and what they read in the text. It is also in contrast with the result of Stankovic,Besic,papic and Aleksic (2011) which found that mind mapping was the most powerful tool that could be used to improve reading comprehension since it enabled the learners to see the relations and links between the main ideas and the sub ideas in addition

to the details and notes to these ideas. This study also rejects the result of Mohaidat's study (2018) which stated that using electronic mind mapping had led to higher comprehension among the experimental group than the control group who used the traditional method. In addition, it also has the different result with afaqeeh's (2018) which asserted that there is a significant effect of the use of IMind (electronic mind mapping) on the students' reading comprehension.

Mind mapping is claimed to assist in mental visualization that helps reading comprehension, retaining and retrieving information (Buzan & Buzan 1996; Tucker, Armstrong & Massad, 2010). Mind map can effectively be used as as scaffolds for higher-order thinking skills (Holzman,2004). In addition, mind mapping not only helps in improving and organizing learning, but it can also help enhancing long term memory retrival as well as cognitive processing of written material (Farrand, Hussain & Hennessey, 2002). In this present study the experiment was conducted to verify the theory whether smartphone e-mind mapping is more effective to improve the students' reading comprehension.

The result of this study yields that the students who received smartphone e-mind mapping didn't demonstrate higher achievement in reading comprehension than their friends in the control group who didn't get e-mind mapping. No study is without limitations. This study is no exception. The result findings which is not confirm the hypothesis that students who receive smartphone e-mind mapping in reading class have get better achievement in their reading compare to students who get non smartphone e-mind mapping may also have several noteworthy limitations

. The factors might influence the students in the experimental group didn't perform better in reading comprehension than the students in the control group. First, the schedule made by the school is not the same, XI MIPA 4, as the experimental group gets Elective English in the fifth and sixth period every Thursday. It is about at 10.20 up to 11.50. While XI MIPA 5's schedule is at the first and second period every Friday. The timing usually influences the physical condition of the students. When the students get lesson at the first and second period, they are still fresh and fully concentrated. While the lesson starts after break, they are usually tired and sleepy.

The second factor is the amount of instructional time devoted to the subjects of the study is limited. The discovery that there was no significant difference in students' reading comprehension between the control group and the treatment group might only due to a short period of treatment. In this case, the students only got three meetings or six periods of lesson for treatment. Due to the tight teaching schedule, students had relatively limited opportunities to practice smartphone E-Mind Mapping skills before incorporating them into their reading. As we should follow the syllabus used in the school, we must share the equal time in one semester to five basic competences covered in this course namely making appointment and reservation, functional text (banner, leaflet, pamphlet, and brochure), expressions of giving example, hortatory exposition text, and song. The students might need more time to familiarize themselves with the concepts of smartphone-mind mapping.

Moreover, the result of this research asserts that although smartphone e-mind mapping doesn't give any significant effect on the students' reading comprehension, it gives significant effect on the students' motivation. It can be

seen from the result of Manova. The sig value of motivation is smaller than 0.05. It indicates that there is a significant effect of smartphone e-mind the students' motivation. This research finding is in line with Rofi'i's (2017) which stated that mind mapping can be used to improve students' motivation. Further he explained that before he applied mind mapping in the class, the students didn't have any positive attitude, feeling or even thought. Almost all of them looked confused with what they had to study. After they got mind mapping, their motivation increased. This result of the research also agrees with Nong in Aljaser (2017) who stated that computer-based mind maps were effective in describing the relationships among concepts, idea classification, building new knowledge, problem solving, critical thinking, and collaborative learning. Further Jbeili (2013) explains that electronic mind mapping can improve students' sense and their motivation to learning and interest.

The result is also consistent with Merchie (2016) that smartphone e-mind mapping can be used to avoid lack of interest during the class. It is due to the fact that smartphone e-mind mapping depend on the inserting images and shapes and using colors easily and effectively and can be linked to many application for instance presentation and documents that made mind mapping flexible in offering information. According to Aljaser (2017) Smartphone e-mind mapping is also supported with many attractive elements. Therefore, English becomes easier and the motivation of the students increases. Smartphone e-mind mapping also links the information to colors and material items that contribute to focusing the subject

in mind. In other words, it links written information to drawings and symbols. Accordingly, the brain learns better when using both hemispheres.

Nowadays, technology has become the daily need where access to vast amounts of information is available easily. Today's young students have grown up with technology all around them. To create 21st century classroom, the use of technology in education is unavoidable. Some studies stated that the use of technology in the classroom contributes the students' motivation. According to Godzicki, Krofel, & Michaels (2013) explained that the power of technology to engage students in relevant learning, in that the use of technology increases students' motivation and engagement. Halat's (2013) in his study which involved the use of Webquests stated that when learners are actors engaged in their own learning, they are more likely to make meaning and construct their own understanding of complex ideas. This is in line with James (2017) that the use of technology and technology-supported learning environments help in improving students' engagement and motivation.

4.2.2.The Different Mean of Reading Comprehension And Motivation Between High Achieving Students Of Control Group And The Ones Of Experimental Group

The problem and the objective of the study which have been stated in chapter one, were also intended to find out whether there is significant difference on reading comprehension and motivation between high achieving students of experimental group and high achieving students of control group. Since there are

two dependent variables and one independent variable in this study, MAnova is applied.

After analyzing the difference between experimental and control group as the whole, it turns to analyze the different mean of reading comprehension and motivation between high achieving students of experimental and the ones of the control group. The result of Manova showed that the mean score of reading comprehension of high achieving students of experimental group was 91.2 while the ones in the control group was 87.2. From calculation using SPSS Manova it indicated that the sig value of reading comprehension was 0.95. This is more than 0.05. It can be concluded that there is no significant effect of smartphone e-mind mapping on the high achieving students' reading comprehension. In other word it accepts H0 which stated that the high achieving students of experimental group have no better reading comprehension than the high achieving students of control group.

Although the result of Manova shows that there is no significant effect of smartphone e-mind mapping on the students' reading comprehension, the mean score high achieving students of the experimental group is higher than the mean score of the high achieving students of the control group. This result is consistent with Peng (2011) who stated that smartphone e-mind mapping increase the level of reading comprehension since it combines two parts of the brain. Besides, it connects between language, words, logical operation, and analysis from one side with creativity, images, construction and imagination from the other. This is also in line with Benavides, Rivera and Rubio (2010) who stated that smartphone e-

mind mapping increases reading comprehension level, increase achievement, facilitates editing of errors and changes design style among learners to bring it out in appropriate way.

As stated by Cain and Oakhill in Springer (2011) comprehension involves interaction of wide range of cognitive skills and process. Further they argue that difficulties may appear which lead to the failure of comprehension. During reading process, the ability to derive meaning is improved when there is reduction in the cognitive load of working memory and the reader can decode the words and phrases and bring meaning to unfamiliar vocabulary encountered (Daneman and Green 1986; Manset-Williamson and Nelson 2005; Pressely 1998 in Springer). Successful readers are efficient at getting the meaning of unfamiliar words from texts since they have more existing vocabularies, more experiences using context clues and greater background knowledge (Ewers and Brownson 1999; Goers et al.1999; Kuhn and Stahl 1998; Stanovich 1986 in Springer). Skilled readers usually performs better than the less skilled readers on measures related to working memory, processing speed and updating information (Nation et al.2002; Swanson and Jerman 2007 in Springer).

High achieving students have some different characteristics compared to low achieving students. As stated in the The IRIS Center's article that there are some characteristics of high achieving students. First, when processing information, they usually connect information to prior knowledge, they identify the important concepts to study, they extract key information from lecturers, they take notes on important information, they monitor their understanding of content.

Second, in terms of retaining and recalling information, high achieving students usually employ and develop their own strategies to remember information.

Next, in the case of organizing materials and managing time, high achieving students tend to stay focused and on-task. They usually use system to keep information for different subject areas organized, i.g. separate note books. They prefer bring all supplies to class. High achieving students tend to have a system for keeping track of assignments on time. They also plan and schedule time to complete a task. The last component is selecting, monitoring, and using strategies. High achieving students are usually strategic about studying. They can use variety of strategies flexibility and generalize to other situation.

On the other hand, the result of data analysis indicated that the mean of students' motivation of high achieving students of experimental group was 144.8, while the mean score of motivation of high achieving students of the control group was 112.8. The statistical computation by using SPSS showed that the sig value of the high achieving students was 0.12. This value was smaller than significant level of 0.05. It means that H0 which stated that there is no a significant of effect of smartphone e-mind mapping on the high achieving students' motivation was rejected. The alternative hypothesis stating that there is a significant effect of smartphone e-mind mapping on the high achieving students' motivation was accepted. It can be said that smartphone e-mind mapping gives a significant effect on the students' motivation of high achieving students. The result of the data analysis for reading comprehension is in line with Yahmun (2011) who stated that there is no significant effect of mind mapping on reading comprehension of the high achieving students.

The result of this study is consistent with Nong (2013) who states that digital mind mapping has a positive impact on the increase of students' motivation and interest toward learning. It is because the application enables the students to achieve their learning outcome more easily. The students also have more confidence and interests in learning the subject. Moreover, they believe that mind mapping can be easily adopted the learning other subject. In addition, according to Fu (2014) teachers can do some actions to motivate the students. First, the teachers can find some attractive supplementary materials to arouse their interests. Second, the teachers can encourage the students' creative and imaginative ideas. They can also encourage the students to do group work. Next, the teachers allow the students to choose their learning materials. The teachers can learn from the experienced colleagues what they do to motivate the students. The next step is using multimedia technology in teaching. The teachers should use various teaching methods in the class. The teacher can adopt the role of a facilitator. They can encourage self-confidence and provide more chances for the students to know the culture of target language. Last, encourage them to communicate more with native speakers.

Electronic mind maps developed critical reading skill, improved learners' writing in English, organized content, increased motivation towards learning English and developed the skill of reasoning and critical thinking (Siriphanich & Laohawiriyanon ,2010; Biddara Kommers &Guimaraes,200). In addition, Trevino (2005), Al-Jarf (2009), and Hourani (2011) explained that the use of mind maps as an educational technique created positive attitudes towards leaning the subject since the use of electronic mind map is simple. They also argued that working on the mind maps in the computer created a competitive atmosphere among students who showed their skills in making the maps.

Hill (2006) stated that mind mapping is like concept mapping. Mind mapping promotes critical and transformational learning since this technique provides learners with opportunities to articulate their current knowledge, critique it, and view how their meanings and values have changed over time. Moreover, mind mapping contributes enthusiasm to the classroom since it tends to increase one's sense of competence in mastering the assigned materials (Menti et al.,1999). Further it is said that mind mapping serves the purpose of enhancing one's intrinsic motivation. In relation to this, smartphone e-mind mapping which employs computer technology can support the learners to learn, increase the learners' control over the material being presented, and allow the learners to take an active role in the learning process.

As education has evolved into 21st century education, learning language does not only focus on building students' language skills but also on building and developing critical thinking, good communication, good collaboration, and creativity in order to survive in the global world (Partnership for 21st century skills, 2007). In addition, now days students are known as native of technology and internet. Also, as modern teachers, they should adapt with this kind of condition instead of avoiding them. They need to associate technology with their way of teaching (Ade Windiana Argina1, Delsi Mitra2, Nur Ijabah3, Rozi Setiawan, in Unnisula Proceeding 2017).

4.2.3.The Different Mean of Reading Comprehension And Motivation Between Low Achieving Students Of Control Group And The Ones Of Experimental Group

As stated in chapter I that this study also wants to find out whether there is significant difference between low achieving students of experimental group and low achieving students of control group. In this study, the researcher employs two dependent variables namely reading comprehension and motivation, and one independent variable that is e-mind mapping. Therefore, Manova of general linear model was used to analyze the data.

After analyzing the data for the high achieving students, it turns to low achieving students. The result of data analysis showed that the mean score of reading comprehension of low achieving students of experimental group was 38.4 while the one in the control group was 31. From calculation using SPSS Manova it indicated that the sig value of reading comprehension was 0.95. This value is more than 0.05. It can be concluded that there is no significant effect of smartphone e-mind mapping on the low achieving students' reading comprehension. In other word it accepts H0 which stated that there is no significant difference on the mean score of reading comprehension ability of the low achieving students of experimental group and control group.

This research finding is not consistent with Yahmun's (2011) that smartphone e-mind mappinggives significant effect on reading comprehension of low achieving students. According to Baker et al (200) students identified as having reading or learning difficulties often have associated cognitive difficulties.

Furthermore, Guthrie et al (1995) argued that variability in reading comprehension may be related to differences in students' cognitive and memory processing abilities. In addition, low high achieving students are considered to have more difficulties integrating read text information (Goerss et al.1999; Pressely 1997). They also have difficulties considering the writer's interpretations and forming appropriate inferences from unfamiliar events or relationship (Andrews 1996; Goerss et al.)

Low achieving students have different characteristics with the high ones in terms of four executive function process related to learning. The first is processing information. In processing information, the low achieving students do not activate their prior knowledge. They do not know what information to study. They also have difficulty in identifying important information during the class. The low achieving students tend to focus on irrelevant information. They do not take notes, or try to record the teacher's saying. They do not monitor their understanding of content.

The second component is organizing materials and managing time. The low achieving students are easily distracted and engage in off-task behavior. They do not have system for organizing information for different subject areas. They usually forget to bring school stuff in the class. Low achieving students have difficulty keeping track of assignment and submitting them on time. They get into trouble estimating the duration of the task. When working on a project, they usually run out of time. They need more time than their friends to complete the tasks.

Next component is organizing materials and managing time. The low achieving students are easily distracted and engage in off task behavior. They don't have a system for organizing information for different subject areas. They often forget to bring school stuff to class. They have difficulty keeping track of assignments and turning them on time. When working on a project, they usually run out of time. They need more time to complete the task than their friends.

In the area of selecting, monitoring, and using strategies, the low achieving students don't know the way to study. They forget to use a strategy. They have difficulty using a strategy in a different content area or situation. They lack of knowledge of an appropriate strategy. They use inappropriate or ineffective strategies. They use the same and often ineffective strategy for all academic tasks.

On the other hand, the result of data analysis indicated that the mean of students' motivation of high achieving students of experimental group was 144.8, while the mean score of motivation of high achieving students of the control group was 112.8. The statistical computation by using SPSS showed that the sig value of the high achieving students was 0.12. This value was smaller than significant level of 0.05. It means that H0 which stated that there is no a significant of effect of smartphone e-mind mapping on the high achieving students' motivation was rejected. The alternative hypothesis stating that there is a significant effect of smartphone e-mind mapping on the high achieving students' motivation was accepted. It can be said that smartphone e-mind mapping gives a significant effect on the students' motivation of high achieving students.

This in line with Syawal and Phatahudin (2017) high motivation should have been owned by the students with appropriate teaching and learning approach so that the students can acquire the learning material and apply it in their real life situation.

Therefore, teaching approach should go along with the importance of endorsing students'
motivation. In addition, according to Jonsoon (2018) there are three basic needs should be
considered important for enhancing students' motivation, namely competence,
relatedness, and autonomy. Giving feedback that makes the students feel competent will
likely enhance their motivation. On the other hand, providing negative feedback or giving
too difficult assignment can make the students feel incompetent. It may decrease the
students' motivation. However, a perception of competence will not increase motivation
unless accompanied by a feeling of autonomy. In other word, the students need to believe
that their own efforts enable them to succeed (Deci & Ryan:200). Relatedness also affects
the students' motivation. Students' cooperation results stronger feeling of relatedness
among students. according to Hornstra et al., 2015) caring teacher and positive students'
relationship give positive influence on students' motivation especially low achieving
students.