

CHAPTER IV

FINDINGS AND DISCUSSIONS

The chapter below presents the description of the research findings from statistical computation in SPSS 17 for windows and from the interview. It also presents the discussion of the research findings. Thus, this chapter is divided into two main parts, findings and discussion. Specifically, findings are divided into four parts: the pilot test score analysis, the pretest score analysis, the posttest score analysis, and the research findings from the interview. The findings are then analyzed and interpreted in the discussion part.

4.1 Research Findings

4.1.1 The Pilot Test Scores Analysis

The validity, reliability, index of difficulty and the level of discrimination per item test were identified from the pilot test score.

4.1.1.1 The Validity Test

The data from the pilot test were analyzed by using Pearson Product Moment Correlation in SPSS 17 for windows to check the validity of each test item. The result of statistical computation of pilot test is presented in the following table:

Table 4.1**Test of Validity Instrument**

Item Number	Raw Score	Interpretation
1,3,7,9,17,24, 25, 26, 28, 32, 33, 34, 36, 38, 44	0.000-0.200	Very Low
4, 6, 8, 11, 14, 20, 21, 22, 23, 27, 31, 37, 39, 42, 45	0.200-0.400	Low
2, 10, 12, 15, 19, 29, 30, 40, 41, 43	0.400-0.600	Moderate
5, 13, 16, 18, 35	0.600-0.800	High
-	0.800-1.000	Very High

Table 4.1 shows that 30 of 45 questions are appropriate to be used as the research instrument because those items were interpreted as moderate, high and low items. Meanwhile, the very low items cannot be used as the research instrument. They were excluded from the arrangement of the research instrument. The result of validity analysis on statistical computation can be seen in the appendix E.

4.1.1.2 The Difficulty Test**Table 4.2****The Result of Difficulty Test**

	Interpretation	Item Number
Index of Difficulty	Acceptable	2, 3, 4, 5, 6, 8, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 27, 29, 30, 31, 33, 35, 37, 39, 40, 41, 42, 43, 4
	Non-Acceptable	1, 7, 9, 17, 24, 25, 26, 28, 32, 34, 36, 38, 44

According to Henning (1987 cited in Fulcher and Davidson, 2007), the items with the facility values around 0.5 are considered to be ideal, with an acceptable range of 0.3 to 0.7. Therefore, only 32 of 45 items were appropriate to be used as research instrument. The result of the level of difficulty analysis can be seen in the appendix E.

4.1.1.3 Discrimination

Table 4.3
The Result of Discrimination Test

Index of Difficulty	Interpretation	Item Number
	Acceptable	2, 4, 5, 6, 8, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 27, 29, 30, 31, 35, 37, 39, 40, 41, 42, 43, 45
	Non-Acceptable	1, 3, 7, 9, 17, 24, 25, 26, 28, 32, 33, 34, 36, 38, 44

Based on table 4.3 above, 30 from 45 items are acceptable to be used as the research instrument while 15 items are not appropriate to be used as the research instrument. Because only the items with $r_{pbi} = 0.25$ or greater are considered as an acceptable test items. Thus, fifteen items (1, 3, 7, 9, 17, 24, 25, 26, 28, 32, 33, 34, 36, 38, and 44) were excluded from the arrangement of the instrument. The result of discrimination analysis can be seen in the appendix E.

4.1.1.4 The Reliability Test

Reliability of the reading test instrument was analyzed by using Cronbach's Alpha in SPSS 17 for windows.

Table 4.4

Test of Reliability Items

Cronbach's Alpha	N of Items
.716	45

Table 4.4 shows that the reliability of the instrument (Cronbach's Alpha) is 0.716. According to Vaus (2002: 20) an alpha obtained was interpreted as a reliable set of item. Therefore, the instrument was used as an instrument in the research. The result of reliability analysis on statistical computation can be seen in the appendix E.

4.1.2 The Pretest Score Analysis

Table 4.5

The Pretest Score

Group	N	Mean	Std. Deviation
Experimental	35	63.2	13.1
Control	35	62.1	11.5

From the statistical analysis of means in SPSS 17 for windows, it can be seen that the mean score on experimental group was 63.2, while the mean score of control

group was 62.1. These means were not too far. However, it can be concluded that the means scores between experimental and control group were not significantly different. To investigate whether or not the means score of pretest from experimental and control were significantly different, the independent t -test was conducted in the data analysis. Beforehand, the calculation of normally distribution and homogeneity of variance were conducted.

4.1.2.1 Normal Distribution Test

In analyzing whether or not the pretest scores were normally distributed, Kolmogorov-Smirnov test was used in the research. The denotation of test statistic for Kolmogorov-Smirnov test was the letter D . The percentage on SPSS 17 for windows proved that $D(35) = .142$, $p(0.07) > .05$ and $D(35) = .146$, $p(0.06) > .05$. The significant value of the pretest scores from both groups was bigger than 0.05. In other words, it can be concluded that the distribution of the sample was a normal distribution. Degree of freedom (df) from the table was the number in the bracket. The result of normality distribution test on statistical computation can be seen in the appendix F.

4.1.2.2 The Homogeneity of Variance Test

In analyzing whether or not the variance of the pretest scores were equal, Levene test in SPSS 17 for windows was used in the research. Levene's test was denoted by the letter F and there were two different degrees of freedom. Based on the calculation of Levene test, it can be seen that the variance were equal, $F(1, 68) =$

.710. The value of F was higher than the level of significance ($0.402 > 0.05$). Therefore, the null hypothesis of the pretest score can be accepted in which the variances of pretest scores in both groups were equal. The result of homogeneity of variance test on statistical computation can be seen in the appendix F.

4.1.2.3 The Independent t -test Analysis of Pretest Scores

After testing the normality distribution and the homogeneity of variance from the pretest scores, the independent t -test was conducted in the data analysis. It was conducted to investigate whether or not there was a significance difference between the pretest score both in experimental and control groups. The result of the independent t -test on pretest score indicated that on average, experimental group students had better reading scores ($M = 63.2, SE = 2.226$) than the control group students ($M = 62.1, SE = 1.948$). However, the difference was not significant because $t(68) = -.388, p > .05$. In addition, two-tailed value of p was 0.699, in which it was more than 0.05. Thus, it can be concluded that there was no significant difference between the mean for the experimental and the control group. The result of the independent t -test of pretest scores on statistical computation can be seen in the appendix F.

4.1.3 The Posttest Scores Analysis

The data below were obtained from the analysis of posttest scores after conducting several treatments:

Table 4.6**The Posttest Score**

Group	N	Mean	Std. Deviation
Experimental	35	81.4	9.33
Control	35	76.1	8.49

From the table above, the mean of experimental group is 81.4; meanwhile the mean for the control group is 76.1. From the table, it can be seen that there were a significant difference between the means from experimental and control group. Moreover, to prove whether or not the means of both groups were significantly different, the independent *t*-test calculation was used in the data analysis. Before analyzing the posttest score by using independent *t*-test, the similar steps with the analysis of pretest score were conducted in the research.

4.1.3.1 Normal Distribution Test

In analyzing whether or not the posttest scores were normally distributed, Kolmogorov-Smirnov test was used in the research. The denotation of test statistic for Kolmogorov-Smirnov test was the letter *D*. The percentage on SPSS 17 for windows proved that $D(35) = .142, p(0.071) > .05$ and $D(35) = .123, p(0.200) > .05$. The significant value of the scores of posttest of both groups was bigger than 0.05. In other words, it can be concluded that the distribution of the sample was a normal distribution. Degree of freedom (*df*) from the table was the number in the

bracket. The result of normality distribution test on statistical computation can be seen in the appendix F.

4.1.3.2 The Homogeneity of Variance Test

In analyzing whether or not the variance of the posttest scores were equal, Levene test in SPSS 17 for windows was used in the research. Levene's test was denoted by the letter F and there were two different degrees of freedom. Based on the calculation of Levene test, it can be seen that the variance are equal, $F(1, 68) = .267$. The value of F was higher than the level of significance ($0.607 > 0.05$). Therefore, the null hypothesis of the posttest score can be accepted in which the variances of posttest scores in both groups were equal. The result of homogeneity of variance test on statistical computation can be seen in the appendix F.

4.1.3.3 The Independent t -test Analysis of Posttest Scores

After finding the normality distribution and the homogeneity of variance from the posttest scores, the independent t -test was conducted in the data analysis. It was conducted to investigate whether there was a significance difference between the posttest score both in experimental and control groups. The result of the independent t -test on posttest score indicated that on average, experimental group students had a better reading score ($M = 81.4$ $SE = 9.33$) than the control group students ($M = 76.1$, $SE = 8.49$). The difference was highly significant because $t(68) = 2.502$, $p < .05$. In addition, two-tailed value of p was 0.015, in which it was less than 0.05. Thus, it can be concluded that there was a significant difference

between the mean for the experimental and the control group. The result of independent *t*-test of posttest scores on statistical computation can be seen in the appendix F.

4.1.3.4 Effect Size on Independent *t*-test of Post-test Scores

To investigate whether or not the treatment gave some effects on students' reading ability, the calculation of effect size was conducted in the research. If the result on effect size was very big, it means that the treatment worked well. Then, the result represented effect size with the value of $r = 0.29$. According to Coolidge (2000: 151) the r obtained can be categorized as a medium effect size, because a medium effect size is about 0.243. It means that there was a major effect of mind mapping technique in improving students' ability in reading descriptive text.

4.1.3.5 The Matched *t*-test Analysis on Experimental Group Scores

To investigate whether or not there was a significant difference between experimental group's pretest score with their posttest score, the analysis of dependent *t*-test was conducted in the research. The result of the dependent *t*-test on experimental scores showed that on average, the experimental group students got a bigger reading score on the posttest ($M = 81.4$, $SE = 1.57$) than the score on the pretest ($M = 63.5$, $SE = 2.04$). This difference was highly significant $t(34) = 5.808$, $p < .05$. In addition, the two tailed value of p was 0.000 in which it was less than 0.05. Thus, the null hypothesis was rejected. In other words, there was significant difference in terms of students' reading comprehension on descriptive

text in experimental group. Means of students' scores in reading test were highly increased from 63.5 in pretest to 81.4 in posttest. It can be concluded that several session of treatments (mind mapping technique) in teaching descriptive text improved students' reading comprehension on experimental group's scores. The result of the dependent *t*-test on statistical computation can be seen in the appendix F.

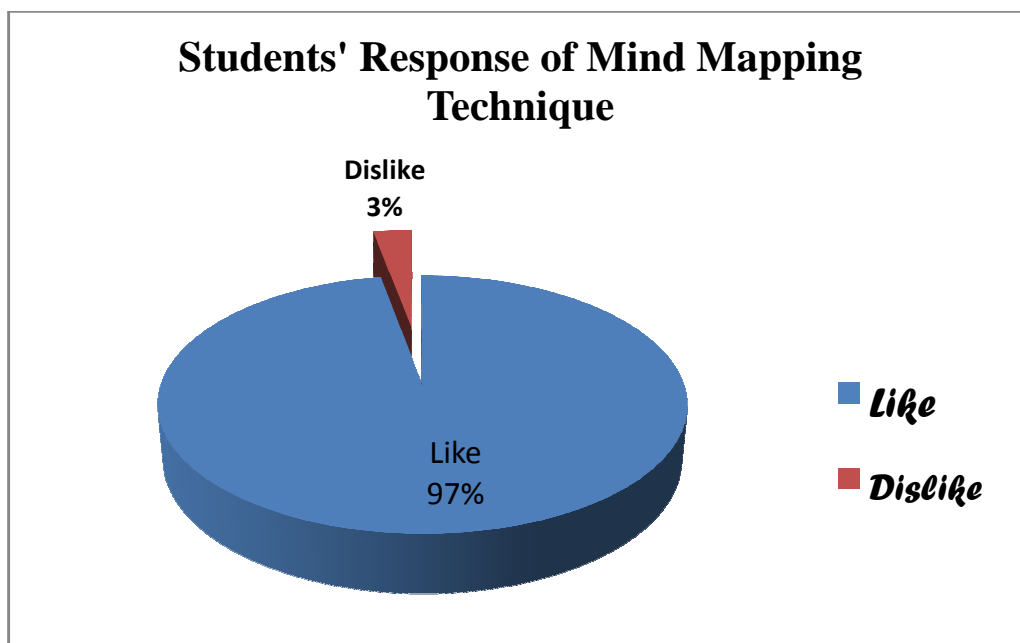
4.1.3.6 Effect Size on Matched t-test of Experimental Group Scores

The result of the calculation of effect size presented the value of $r = 0.705$. The result of the effect size above showed that the *r* value represented a large effect size. The large effect size means there was a large effect of mind mapping technique in experimental group. In other words, the implementation of mind mapping technique gave a significant effect on experimental group students in improving their reading comprehension on the descriptive text.

4.1.4 Research Findings from Interview

The open interview was conducted at the end of treatment sessions to investigate the obstacles, advantages and disadvantages of mind mapping technique from students' perception. There were five questions which were asked to the students in experimental group. Charts below represented the students' response on the interview:

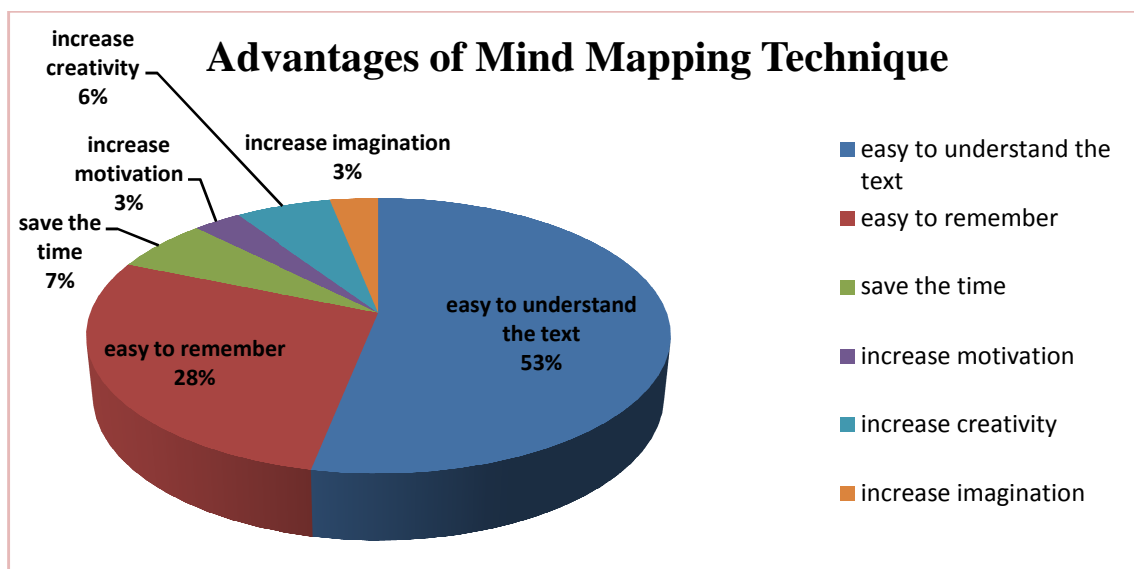
Chart 4.1



From the chart 4.1, almost all of the students in experimental group gave positive responses on mind mapping technique. However, only a few participants who were not interested in mind mapping technique did not give positive response. It means that, the students felt enthusiastic in learning descriptive text by using mind mapping technique.

Furthermore, there are some advantages of mind mapping technique. Referring to the students' responses, frequent advantage that the students could take from mind mapping technique was the technique made them easier to understand the text. Clearly, some advantages of mind mapping technique can be seen in the following chart:

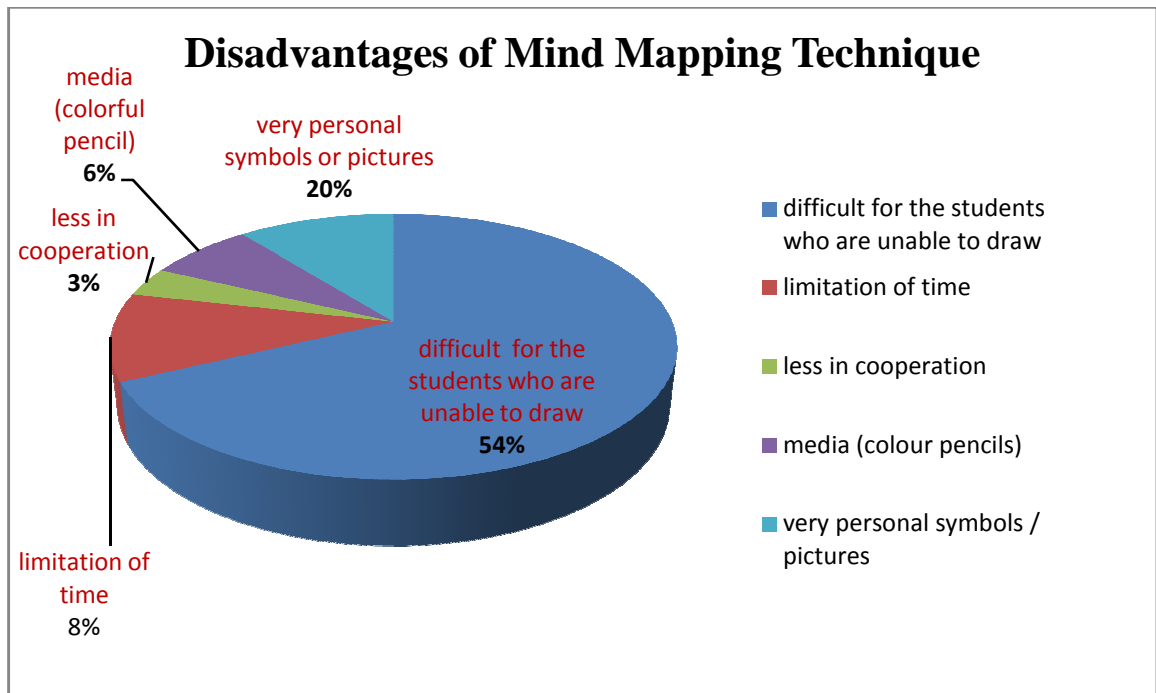
Chart 4.2



The result of chart 4.2 shows that mind mapping technique had helped the students to read descriptive text easier. By using mind mapping, students can save the time to understand the text. Students also said that mind mapping technique had helped them to remember information from the text and it increased their imagination. In addition, students explained that they became more creative when they made a mind mapping.

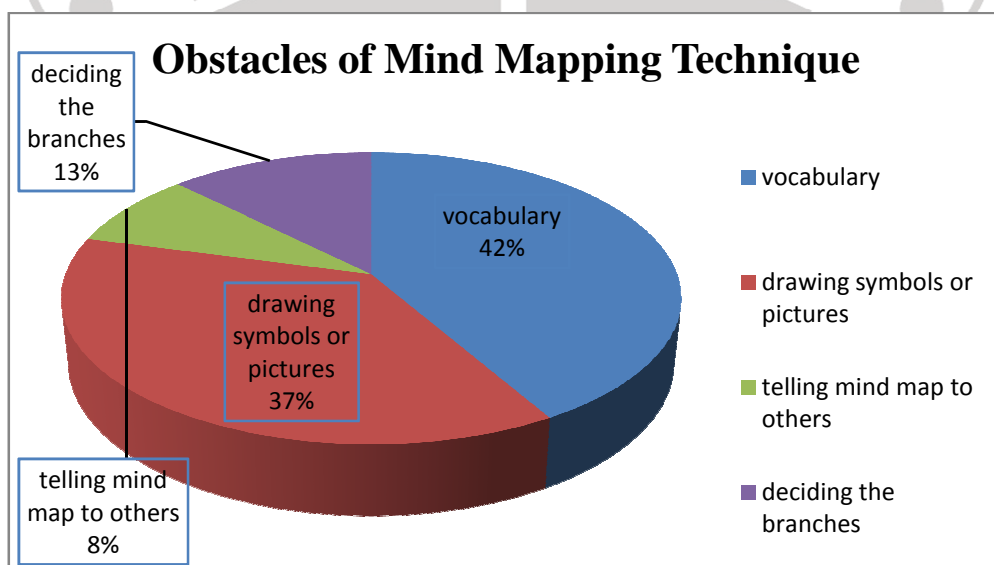
However, the students still found the disadvantages of this technique. Specifically for the students who were unable to draw pictures or symbols, this technique can discourage students' motivation in reading descriptive text. That information was represented on chart 4.3.

Chart 4.3



In addition, the students also found some obstacles on the implementation of mind mapping technique. It can be seen in the following chart:

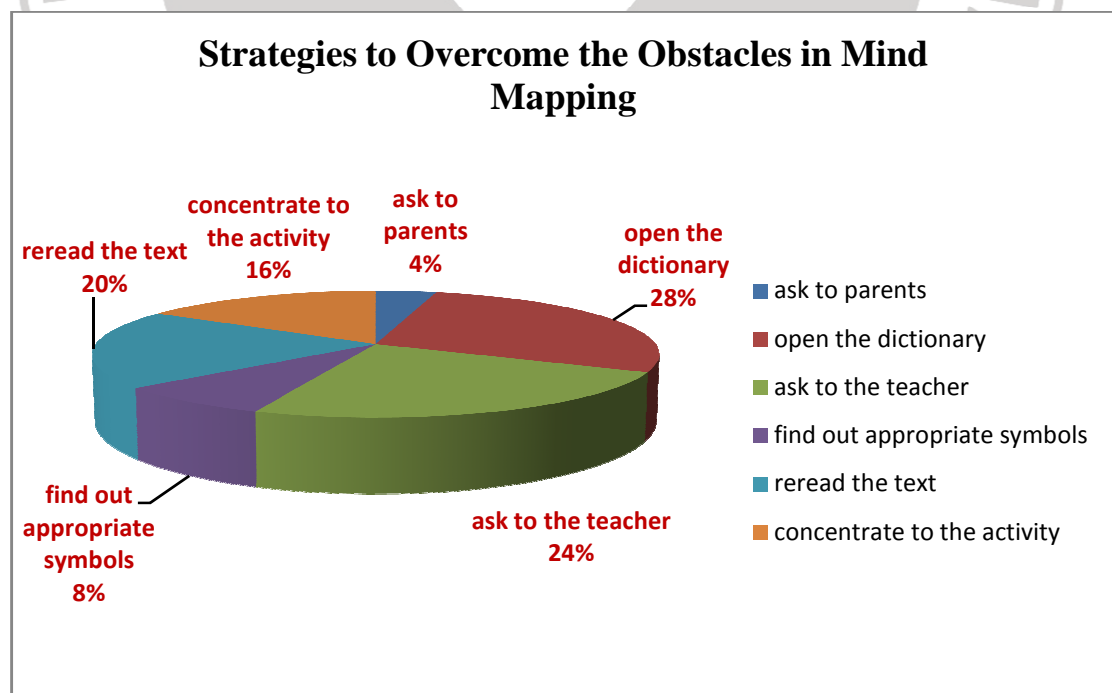
Chart 4.4



From the chart 4.4, it can be seen that there were five obstacles in implementing mind mapping technique. Referring to the students' responses, the most difficult thing to do in implementing mind mapping technique was in finding and drawing appropriate pictures or symbols.

Overcoming some obstacles found by the students in implementing mind mapping technique, some strategies had been conducted by them for example by asking to parents and the teacher, open the dictionary, concentrate to the activity, find out appropriate symbols and also reread the text. Students' strategies in overcoming the obstacles on the implementation of mind mapping technique can be seen in the chart below:

Chart 4.5



4.2 Discussions

4.2.1 The Effectiveness of Mind Mapping in Improving Reading Ability

From the result on statistical analysis on the research findings, it can be seen that mind mapping technique was effective in improving students' ability in reading descriptive text. It was proved by the significance difference between students' score on posttest compare with the students' score on the pretest.

Before mind mapping technique was implemented as the treatment on the experimental group, the students both in experimental and control groups had similar ability in reading descriptive text. It can be seen on the result of statistical calculation in SPSS 17 for windows on the research findings. Both groups did not have a significant difference on their means score on pretest. However, the posttest score in experimental group then increased; the experimental group had better reading scores after several treatment sessions. The posttest mean score of experimental group was greater than the posttest mean score of control group. Therefore, it can be concluded that mind mapping technique was effective in improving students' ability in reading descriptive text. In addition, the large effect size also supported the statement above. Mind mapping technique was given significant effect in improving students' ability in reading descriptive text.

The effectiveness of mind mapping technique was not only proved by the result of statistical analysis on research findings but also on the students' language behavior and students' response in classroom activities during the experimental treatment. Almost all students in experimental group very enjoyed learning activity by using mind mapping technique. It can be seen on chart 4.1.

Mind mapping technique increased students' motivation in reading descriptive text because mind mapping gave the students the chance to interact with the text. When the students made mind mapping of the text, they can decode the language as thought. They practiced to focus on the keywords of the text and then they should write it down on their mind mapping. As the result, reading activity is not accepted as a difficult or bored activity.

Mostly, students' responses on the interview also showed that the students really enjoyed the process of making mind mapping. Especially for the students who really liked drawing, mind mapping gave the students chance to add some color lines, pictures or symbols on their mind maps; in which it can increase the creativity. The students can enjoy every single step in understanding the text and they will not feel that they read the text just for testing their reading comprehension or as a task to test their ability. Reading by using mind mapping can really help the students to understand the content or information in the text.

In addition, in teaching learning process by using mind mapping, all students were trained to be an independent reader. If the students met some vocabulary, they can use the dictionary to help them resolve the problems. The teacher did not directly tell the meaning of the difficult words but the teacher asked the students to find the meaning from the dictionary. Students were also challenged to guess meaning from the context of sentence. This condition was very good to the students. As the consequence, the students had initiative in reading process and did not always depend on the teacher to know the information about the content of the text.

In conclusion, the effectiveness of the implementation of mind mapping technique in teaching reading to the seventh grade students of SMPN 12 Bandung was not only proved by the statistical computation, but also by the students language behavior or responses towards the process of teaching and learning.

4.2.2 The Advantages and Disadvantages of Mind Mapping Technique

From the research findings on the open interview, there were some advantages and disadvantages of mind mapping implementation from the students' perception. Most of students said that the frequent advantages that they could take from mind mapping implementation were easier and faster in understanding the text, easier to remember information, increase creativity and also save the time in understanding the text.

From many advantages that the students could take from mind mapping implementation, easier and faster in understanding the text were then accepted as the most frequent advantage from the students' point of view. The reason for this was the students must read quickly and mostly focus on the keywords when they made mind mapping from certain text. The students did not need to know the meaning of all words which was preserved in the text. They just needed to read quickly to find the main ideas and keywords when they started to reorganize the information in the text into their mind maps. Thus, the students were accustomed to skim the information before they add detail information into their mind mapping. It was certainly can make the student faster and easier in understanding general information or main ideas of the text.

Other frequent advantages of mind mapping were helping the students to remember information and increasing their creativity. By implementing mind mapping technique, the students easily remembered any information from the text since in making mind mapping the students had chances to insert pictures or symbols. By using those color pictures or symbols, the students can recall the information or even vocabulary in the text easily.

In addition, every student wanted their mind map be the most interesting one. Therefore, the chances to draw appropriate symbols or pictures can make the students more creative in teaching learning process. It can also increase students' imagination. If the students can make an attractive and interesting mind mapping, it can courage their motivation to read and read again their mind mapping. Indirectly, it can also courage the students' interest to enjoy reading the original text.

Yet, mind mapping implementation had several disadvantages in SMPN 12 students' perception. Referring to the various students' responses, most of them agreed that the disadvantages of mind mapping technique were this technique needed the ability of drawing pictures or symbols. Especially for the students who were unable to draw, this technique can decrease their confidence in making mind mapping. The students did not like the teacher seeing what they were doing because they were afraid they did not add a good picture or symbol into their mind mapping.

Furthermore, because in making mind mapping we can use our personal symbols or pictures, the students cannot directly understand the meaning of

symbols or pictures which was used on their friends' mind mapping. As the consequence, each student worked individually during the time they were making the mind mapping. They cannot ask another student how to create certain symbols or pictures to represent an idea or words because the use of symbols in mind mapping for one person will not be the same with the use of symbols in another person. Sometimes, this condition made the students be lazy in making mind mapping, particularly for the students who were unable to find or draw an appropriate symbol or picture.

Limitation of time to make a colorful mind mapping in the classroom also had been an important issue in the implementation of mind mapping technique. Since the classroom activity took only 2 X 40 minutes per meeting, the students rarely had chances to decorate a very interesting and colorful mind mapping and felt being restricted by the time. Sometimes, it made them feel unhappy. Nevertheless, that problem usually can be solved by asking the students to finish their mind mapping at home.

In addition, the need of color pencils in making mind mapping for some students was accepted as a difficult thing. It happened because of an economic reason of the students; for example if they did not have much money to buy the color pencils. Therefore, in classroom activity, the teacher usually asked the students to lend the color pencils to another student who did not bring it.

4.2.3 The Obstacles in Implementing Mind Mapping Technique

The implementation of mind mapping technique did not always run smoothly. The students still found some obstacles in implementing mind mapping technique. From the result of students' responses in open interview, the most frequent obstacles found in the implementation of mind mapping technique was the difficulty in drawing appropriate symbols or pictures particularly for the students who were unable to draw. They needed the attention from the teacher to guide them in finishing their mind mapping.

Nevertheless, the students had their own strategies to overcome the obstacles in the implementation of mind mapping. Some strategies that had been used by the seventh grade students in SMPN 12 Bandung to overcome the obstacles in mind mapping technique included open up the dictionary, ask to parents, ask to the teacher, find out appropriate symbols, reread the text and try to concentrate to the activity.

Open the dictionary was the most frequent strategy used by the students to overcome the obstacles in mind mapping, particularly when they found some difficult words from the text. The students also had been initiative to ask to the teacher in classroom activity when they met some problems in understanding the text or in making the mind mapping. At home, because mind mapping usually was used as homework, the students stated that they also asked to their parents to help them overcoming the obstacles in making mind mapping. The students also tried hard to find appropriate symbols for their mind mapping. They argued that the use

of appropriate symbols in their mind mapping made them easily to remember the information in their mind mapping.

For quite learners, the strategy to overcome the obstacles in mind mapping was by rereading again the text. By doing this, slow but sure, these students were also being able to comprehend the information in the text. The students also tried hard to concentrate while they were making the mind mapping. As the result, all students can make mind mapping smoothly. The discussion between the students about the ideas in the text also helped the students overcoming the obstacles. Last but not least, teacher as the facilitator can give some comments on students' work or discussion to support students' confidence in making mind mapping.

