

# Using Mind Maps to Improve the Students' Reading Skills at Dong Nai Technology University

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## ABSTRACT

This is an experimental research about reading skills at Dong Nai Technology University. Its objectives are to find out students' perception about reading and mind maps as well as to find out whether mind maps can help students in improving their reading skills or not. The data were collected through tests and questionnaires. The test included pre-test and post-test which were delivered before and after the experimental teaching for both control class and experimental class. The questionnaires were delivered only to experimental class before and after the treatment. The results of this study showed that mind maps technique really helped in improving the students' reading skills.

**KEYWORDS:** reading skills, mind maps, Dong Nai Technology University

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## INTRODUCTION:

In Vietnam, English is used as a foreign language and taught as a compulsory subject at all levels of educational system from kindergarten to university. There are four skills including reading, speaking, listening and writing taught in English teaching and learning process. Reading is one of the essential skills that need to be mastered when learning English as Nunan (2003) proposes the significance of reading skills to English second language (ESL) students and states that reading skills can ensure students to be successful not only in English learning but also in other field where reading is required. Therefore, reading skills can enable students to achieve great progress and development in every aspect of learning and gain access to a huge source of knowledge and information written in English. However, it is not easy for students to be competent in reading skills because it cannot be separated from comprehension. If the learners do not understand the text, they cannot comprehend the information from the text they read. Moreover, the reading activities require the learners' knowledge in identifying the structure and the main topic of the text. As a result, students need to develop their reading skills to get the knowledge easily.

## Rationale of the study

At Dong Nai Technology University (DNTU), students have to complete a wide variety of assignments and tasks given by the lecturers which required them to read books and scientific articles in both Vietnamese and English.

Accordingly, they need to develop their reading skills in order to meet these requirements. However, after three years teaching at DNTU, the researchers realize that the reading skills of the students here are still at low levels. Most of them suppose that the reading lessons are the most boring part in English, so they are not very patient with the texts, especially the long texts. When they have to do the reading tasks, they have a tendency to look up all the new words to make sure that they understand the meaning of all words before doing the tasks, which takes them a lot of time to finish. As a result, they usually feel bored with the texts or even develop a fear for reading texts gradually.

In light of the abovementioned facts, the researchers would like to find a better way to make students more interested and motivated in reading activities. Thus, they can comprehend the text easily and gradually improve their skills in reading. In this case, the researcher chooses mind maps technique because when using mind maps, learners can speed up and develop their thinking rapidly. Moreover, mind maps give an easy way for the students to plan, communicate, be creative, arrange, and explain the ideas quickly. It also facilitates the students to understand a complicated system or structure because mind map delivers the students to be focused on the ideas (Indrayani, 2014). Therefore, the researchers conducted this study mainly to find out about the attitude of the students toward reading and mind map technique as well

as to explore whether the mind map technique can improve the students' results in reading tests at DNTU.

### Research questions

Based on the main objectives, this research is mainly the answer for the following questions:

1. To what extent does the mind maps technique improve the reading skills of students at Dong Nai Technology University?
2. What are the attitudes of the students toward reading and mind map technique?

### Scope of the study

The focus of this study is on using mind maps to improve the students' reading skills at DNTU. Since students are not very interested in reading lessons, often get bored with long reading texts, and may not have sufficient vocabularies to understand the texts or reading strategies to comprehend easily, the researcher would like to find a good way to help them overcome those problems.

The subjects of this study are 61 second-year students coming from two classes that the researcher is teaching. They are going to participate in doing the test and respond to the survey questionnaire.

## LITERATURE REVIEW

### The advantages of using mind map in teaching

Buzan (1994) defines mind map as an example of radiant thought which is an instinctive feature of human mind. It uses graphic technique that offer a universal key to activate the capacity of the brain. It is accessible to be extended to any areas of life where better learning and more apparent thoughts can improve human performance.

The mind map can be applied to every aspect of life where improved learning and clearer thinking will enhance human performance. The mind map has four essential characteristics:

1. The subject of attention is crystallized in a central image.
2. The main themes of the subject radiate from the central image as branches.
3. Branches comprise a key image or key word printed on an associated line. Topics of lesser importance are also represented as branches attached to higher level branches.
4. The branches form a connected nodal structure.

Siriphanich (2008) states in her study that mind map involves the use of visual frameworks including figures, diagrams or charts to present structural knowledge spatially with the purpose of empowering comprehension and learning. In addition, mind map are useful in helping to convey knowledge since they can explain complex ideas into straightforward, meaningful displays, so that students can gain more comprehensive understanding of the concepts to be learned. Moreover, mind map is a tool for enhancing learning and thinking. It provides a structure to reveal various aspects of a story such as the sequence of events, the key points, the cause and effect, the relation of ideas and so on. Students can use mind maps for revising and clarifying thoughts so as to get the deep meaning of a story. DePotter and Hernacki (2004) also defines mind map technique and the mind mapping is a technique to use

the whole brain by using visual and other graphic to create a meaningful impression.

According to Buzan (1994) mind map technique brings many advantages in developing reading skills. It helps to save a lot of time by reading just the related words and examining notes on the mind map. Moreover, it increases focus on actual matters and makes the readers easier to distinguish the essential key terms. When using mind maps, it is easier for the brain to accept and recall visually appealing, multi-colored, multi-dimensional mind charts, rather than monotonous repetitive linear information. In addition, the association made between key terms are explicit and relevant. Finally, the mind map functions in accordance with the innate inclination of the brain for completion or completeness.

### The effectiveness of mind map technique in teaching and learning reading skills

Siriphanich (2008) conducted a study with 35 first year students on using Mind Mapping Technique to Improve Reading Comprehension Ability of Thai EFL University Students. In this study, the researcher employed both quantitative and qualitative data analyses from pre-and post-tests, a questionnaire, and an interview. After the research, the researcher showed that the mean core of the students in the post test was higher than in the pre-test. Finally, he concluded that the mind map technique could improve the students' ability of reading comprehension and it was considered as a useful technique and it can be applied to non-English subjects.

Another study on using the Mind Map Technique at SMA N 1 Kretek in the Academic year of 2013-2014 by Suryani (2014) was an action research that was conducted in 2 cycles. The results of this study proved that mind map technique could improve the students' reading skills. After the researcher had implemented the actions, the students developed their skills in identifying the topic of the text. They became more excited and motivated in reading lessons.

In 2014, Indrayani conducted a study entitled "The Effectiveness of Using Mind Mapping in Improving Students' Reading Comprehension of Narrative Text". This quasi-experimental study aimed at finding out whether mind mapping technique is effective to improve students' reading comprehension achievement. There were 70 students participated in her study. The gained score of the experimental class (27.14) is higher than the control class (17.71) and the result of statistic calculation showed that the value of  $t(3.67) > t\text{-table}(1.66)$ . Therefore, she concluded that mind mapping technique is effective to improve students' achievement in reading comprehension.

In Vietnam, Nguyen Thi Thuy Van (2012) developed a study on using mind mapping techniques to develop Ly ThuongKiet high school 11th grade students' reading text summary skills. This was a quasi-experimental research with the participation of 80 students from 2 classes (the experiment class and the control class). The researcher used both test and questionnaire as the data collection methods. The findings from this study showed that using mind-mapping improved students' reading text summary skills.

Ho Thi Huong (2014) also showed her interests in mind map technique by doing a study within Nghe An College of Economics context on the stimulation of mind map to students in reading comprehension. The subjects of this study were 97 students and 7 teachers of English group. This study focused on 3 research questions. Firstly, the researcher wanted to investigate students' and teacher's attitudes towards the reading texts. Secondly, the researcher wishes to explore students' and teacher's perception toward mind mapping. Finally, she hoped to find out if mind mapping technique could help to increase students' interest in reading comprehension. The interview and questionnaire were used to get data. The results of the study showed that mind mapping technique were really helpful on improving students' interest in reading comprehension.

One more study was conducted by Ngo Thi Phuong Thao (2016) entitled "Effects of Mind mapping on freshmen's reading comprehension ability at Ho Chi Minh City University of Transport". Three main data collection instruments were used in this study including questionnaire, test and interview. The results of sample t-test showed the disparity between the experimental class's mean score and control class's mean score. The questionnaire and interview were used to determine the attitude of the students. After the treatment, the researcher proved that the students in experimental class had made a great progress in their reading ability, but the control class had not. It could be concluded that the mind mapping has great effects on students' reading comprehension ability.

Those studies above showed that the mind maps technique was effective on improving the students' reading competence. It could be considered as one of the good ways to help students in reading. However, the students at DNTU still have a number of difficulties in reading. They show no interest in reading lessons or even their reading skills are at low level. Hence, this study was conducted with the hope to find out the effects of Mind maps on reading. There from, it can be used as a useful tool to improve the students' reading skills at DNTU.

## METHODOLOGY

### The research settings

The study was conducted at Dong Nai Technology University in Dong Nai province where there are great opportunities for graduated students to obtain good careers, especially with foreign companies. The students there are trained to work in a wide range of different fields such as accounting, baking, engineering, nursing and so on. They are non-English majored students so their English ability is quite low. The participants of this study were second-year students.

### Research Design

Because the main objective of this study was to find out whether mind map technique can improve the reading skills of the students or not, experimental research would be employed in this study. There are two variables including independent variable and dependent variable. The independent variable is using mind maps technique and the dependent variable is reading skills of the students.

### Population and Sample

The population of this study was all of the second-year students at DNTU and the sample of this research was the two classes. Experimental class included 30 students learnt reading with mind maps and control class included 31 students learnt reading without mind maps.

### Data collection instruments

#### Tests

Two kinds of test were used to get data in this study consisting of Pre-test and post-test. They were given to both experimental class and control class in different points of time. The pre-test was given before conducting the experimental teaching and the post-test was held after the treatment. The purpose was to find out whether the mind maps technique could improve the reading skills of the students or not based on the differences of post-test mean scores of the two classes.

Both pre-test and post-test were of the same model and were arranged in 10 multiple choices questions including defining the main idea, topic sentence and some detail information of the texts. They were chosen from the test collection that approved by the Dean of Foreign Language Faculty at DNTU.

#### Questionnaire

In this study, the questionnaires were distributed to the students of experimental class before and after conducting the treatment to see what the attitude of the students toward reading and mind maps technique. The questionnaires that were given to students consisted of 13 statements in Vietnamese language in order for them to understand easily. For each statement, the students have to choose the most suitable provided answers including totally agree, agree, not sure, disagree and totally disagree.

### Data analysis procedures

#### The analysis of test

The data collected from pre-test and post-test would be analyzed with SPSS program. The pre-test and post-test mean scores were calculated to identify the advancement in students reading. The t-test of dependent samples was also calculated to identify the significant differences between the mean scores of pre-test and post-test.

#### The analysis of questionnaire

To analyze the data of questionnaire, the researchers used the following formula:

$$P = \frac{f}{n} \times 100$$

Where:

P : percentage

f : frequency

n : number of sample 100%: constant value

### Ethical consideration

Because the study was conducted with 61 participants, it was critical to consider moral issues. All the students taking part in the experimental class and control class were from the researchers' classes. They were invited to take part in the study voluntarily and each of them was given a consent form to affirm that they had been fully aware of the objectives of the study, together with any risks and safeguards associated with the procedures to be

carried out in the research. Besides that, all students participating in the questionnaire survey were requested their agreement before the questionnaires were delivered to them. Individual data and the information picked up from the survey were held namelessly. The ethical issues were highly appreciated within the conducting of the study so that the study did not violate any rules or regulations.

**FINDINGS AND DISCUSSION**

**Data analysis of Test**

**The pre-test scores**

**TABLE I. THE RESULTS OF PRE-TEST SCORE**

Students	The pre-test scores experimental class	The pre-test scores control class
Lowest	40	40
Highest	80	80
Median	60	60
Σ	1690	1720
Mean	56.33	55.48

The data in the table above expressed the pre-test scores of students in experimental and control class. There are 31 students in the control class and 30 students in the experimental class. The test was given at the first meeting, before conducting any treatment. Both classes had 40 as the lowest score, 80 as the highest score and the median score was 60.

Moreover, the mean score of the experimental class was 56.33 and the control class was 55.48. Thus, it can be concluded that the pre-test score of the two classes was almost equivalent. It means that the English ability of the two classes was not very different.

**The post-test scores.**

**TABLE II. THE RESULTS OF POST-TEST SCORE**

Students	The post-test scores experimental class	The post-test scores control class
Lowest	50	40
Highest	90	80
Median	70	60
Σ	2000	1840
Mean	66.67	59.35

The data in the table above expressed the post-test score of both experimental and control class. The post-test was given to the students after the experimental teaching. In the post-test, the highest score of the control class was 80, and the experimental class was 90. The lowest score of the control class was 40, the lowest score of the experimental class was 50 and the median score of experimental class was 70 while the control class was 60. In addition, the mean score of the control class was 59.35 and the experimental class was 66.67. Hence, the experimental class seemed to have higher significant score than the control class. The researchers also did the t-test later to see whether post-test scores of the two classes were different.

**The gained scores**

**TABLE III. THE RESULTS OF GAINED SCORE**

Students	The gained scores experimental class	The gained scores control class
Lowest	0	-10
Highest	20	20
Median	10	5
Σ	310	120
Mean	10.33	3.87

The data in the table above expressed the gained scores of both experimental class and control class. The lowest score of the experimental class was 0 while the control class was -10. The highest score of the two classes was 20. Therefore, the median score of the experimental class was 10 and the control class was only 5. In addition, the mean of gained score of experimental class was 10.33 and the control class was 3.87.

**Data Analysis**

**The t-test of Pre-test**

**TABLE IV. THE T-TEST OF PRE-TEST**

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Pre test	Experiment	30	56.33	11.592	2.116
	Control	31	55.48	10.276	1.846

Independent Sample Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Pre test	Equal variances assumed	.524	.472	.303	59	.763	.849	2.802	-4.758	6.457
	Equal variances not assumed			.303	57.650	.763	.849	2.808	-4.772	6.471

Table IV reported the analysis of t-test of pre-test for both the experimental class and the control class. According to Julie (2011), to interpret the output from Independent samples t-test, there are two steps need to be followed:

- 1. Check the Sig. value for Levene's test.**
  - If the Sig. value for Levene's test is  $p > 0.05$ , we use the data in the first line (Equal variances assumed) for the next step.
  - If the Sig. value for Levene's test is  $p = 0.05$  or  $p < 0.05$ , the data in line Equal variances not assumed will be used for the next step.
- 2. Check the value in Sig. (2-tailed)**
  - If the value in Sig. (2-tailed) is equal of less than 0.05, there is a significant difference in the mean scores of the two groups.
  - If the value is more than 0.05, there is no significant difference between the two groups.

As we can see in the table IV, the Sig. Levene's test value is  $.472 > 0.05$  and the value of Sig. (2-tailed) is  $0.763 > 0.05$ . Hence, there was no significant difference between the two classes. Moreover, the pre-test mean score of

experimental class was 56.33 and control class was 55.48 as showed in Group statistics table above. Those scores were not much disparity. Therefore, it can be said that the English ability of both experimental class and control class before the treatment was almost equal.

After doing the t-test of the pre-test score, the researchers also did the t-test for post-test. The results can be seen as follow:

**TABLE V. THE T-TEST OF POST-TEST**

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Posttest	Experiment	30	66.67	12.130	2.215
	Control	31	59.68	9.481	1.703

Independent Sample Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper		
Post test	Equal variances assumed	2.544	.116	2.512	59	.015	6.989	2.782	1.422	12.557	
	Equal variances not assumed			2.502	54.884	.015	6.989	2.794	1.391	12.588	

The table V above reported the analysis of t-test for both the experimental class and the control class. The table showed the Sig. Levene's test value is 0.116 > 0.05 and the value of Sig. (2-tailed) is 0.015 < 0.05. According to Julie's theory, it can be concluded that there was a significant difference between the two classes. In addition, the post-test mean score of experimental class (66.67) is much higher than the mean score of control class (59.68). It means that mind maps technique had a significant effect on students reading skill that help them achieved higher scores on the post-test.

At last, the researchers took the t-test of the gained scores of both experimental class and control class to see the comparison between them. Gained score was calculated by computing the difference between the pre-test and post-

test scores of each student. Gained score was really important because it was used to know whether there were any differences between the pre-test and post-test or not. The t-test of gained score is expressed as the following:

**TABLE VI. THE T-TEST OF GAINED SCORE**

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Gained	Experiment	30	10.33	7.184	1.312
	Control	31	3.87	6.672	1.198

Independent Sample Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper		
Gained	Equal variances assumed	.358	.552	3.642	59	.001	6.462	1.774	2.912	10.013	
	Equal variances not assumed			3.637	58.332	.001	6.462	1.777	2.907	10.018	

Based on the analysis of the results above, it can be interpreted that the post- test score of the experimental class was significant different from the post-test scores of the control class. The experimental class's mean scores (10.33) were much higher than the other (3.87). It means that the students of the experimental class who had learnt to apply mind maps in their reading had made a significant progress when they got higher scores in the post-test. In other words, it can be said that mind maps technique has positive effects on improving the reading skills of the students at DNTU.

**Analysis of Questionnaire**

The questionnaire was distributed to the students of experiment class before and after the experimental teaching. The purpose is to see the students' attitude about the reading lesson and the mind maps technique before and after the treatment. Hereafter the results:

**TABLE VII. THE RESULTS FROM THE QUESTIONNAIRE**

No.	Statements	Before the experimental teaching (%)					After the experimental teaching (%)				
		5	4	3	2	1	5	4	3	2	1
1	I like reading newspapers, magazines and materials in English	6,67	16,7	13,3	43,3	20	16,7	40	6,67	23,3	13,3
2	I feel excited during the reading lessons at school.	3,33	20	6,67	50	20	10	40	6,67	36,7	6,67
3	I think "Reading" is really important to students.	0	26,7	26,7	40	6,66	6,67	43,3	13,3	33,3	3,34
4	I can quickly get the main idea of the reading text through the key words.	3,33	16,7	23,3	46,7	10	6,67	46,7	16,7	26,7	3,34
5	I can comprehend the text easily.	0	20	13,3	56,7	10	6,67	46,7	10	36,7	0
6	I review the reading materials many times during the semester.	0	13,3	16,7	56,7	13,3	0	33,3	13,3	53,3	0
7	I have learnt how to apply mind map technique into reading comprehension.	0	0	13,3	86,7	0	0	100	0	0	0
8	The colors and the images of Mind maps help me remember the information better.	0	10	60	23,3	6,67	6,67	30	40	23,3	0

9	I suppose mind maps can help me organize the information of the text well.	0	13,3	50	26,7	10	3,33	36,7	36,7	20	3,33
10	I think mind maps can help me in improving my vocabulary ability.	0	13,3	46,7	36,7	3,33	0	30	36,7	33,3	0
11	I found that mind maps help me save time while reading the text.	0	10	26,7	56,7	6,66	0	33,3	23,3	43,3	0
12	I believe that mind maps can help me in getting the general idea without reading the whole text	0	16,7	40	40	3,34	0	36,7	30	33,3	0
13	I feel more confident in reading with mind map technique.	0	10	16,7	73,3	0	0	30	13,3	56,7	0

**Note: Totally agree = 5; Agree = 4; Not sure = 3; Disagree = 2; Totally disagree = 1**

As can be seen from table VII, before the experimental teaching, more than three thirds of the students (76,66%) did not like or not really like reading materials or documents written in English and they felt bored or not interested in reading lessons at school. Moreover, 73,33% of the students were of the opinion that reading was not important to them. However, the figures had shifted significantly after the experimental teaching, which means they had changed their attitudes towards reading skills. More than half of the students had become interested in reading documents in English and felt excited during the reading lessons, which accounted for 56,7% and 50% respectively. Significantly, half of the students taking part in the survey now realized the importance of reading skills.

When being asked about how they dealt with reading skills before the experimental teaching, 80% of the students agreed that they could not quickly get the main idea of the reading text through the key words since they could not comprehend the text easily and suprisingly 86,67% of the participants indicated that they did not have the habit of reviewing the reading material many times during the semester. After the experimental teaching, the data show positive results that 53,33% of the students were able to get the main idea of the reading text through key words rapidly and they could comprehend the text in an easy way. Moreover, 33,33% of them had developed the habit of reviewing the reading materials many times during the semester.

In terms of mind map technique, none of the students had known about this before the experimental teaching, but all of them agreed that they had learnt how to apply mind map technique into reading comprehension after being introduced to the technique. A third of the students agreed that the colors and the images of mind maps helped them remember the informatin better and 40% of them supposed mind maps could help them organize the information of the text well, although there were only 10% of students agree with the roles of colors and images of mind maps in reading and 13,3 % of them supposed mind maps did help in the organization of the text before they were approached to mind map technique.

Before the mind map technique was applied, a majority of students had suspicions on this technique since almost 90% of them did not show their agreement that mind map could improve their vocabulary ability, save their time while reading the text, help them get the general idea without reading the whole text, and make them feel more confident in reading with mind map technique.

Fortunately, after the reading lessons with mind map technique, more than a third of them had shifted to the agreement that mind map technique was effective in enhancing their vocabulary competence, saving their time while reading, and improving their reading skills, which made them feel more confident in reading with mind map technique.

### Discussion

The data collected and analyzed in this chapter were used to answer for the two questions of this research: "To what extent does mind maps can improve the students reading skills at Dong Nai Technology University?" and "What are the attitude of the students toward reading and mind map technique?"

The results of pre-test and post-test have been analyzed to answer to the first question. From the comparison of the pre- test's mean scores of both experimental class and control class, there was no significant difference between them. The score of experimental class was 56.33 and the other was 55.48. It means that before the mind maps teaching and learning, the English ability of the two classes was almost the same. However, after the treatment, the scores had changed. There was a significant disparity. While the post-test mean score of the experimental class was 66.67, the control class'was only 59.68. It can be concluded that mind maps have a positive effect on improving the students' reading skills since it helped them do the test well and got better scores.

Besides, the results from analysis of questionnaire shows a positive change about the attitude of the students toward reading and mind maps. Before learning mind maps, most of the students did not have the habit of reading books, magazines or materials in English. They usually showed no interests in reading subject at school and feel bored with reading lesson. They even did not believe that mind maps can help them in improving their reading skills. However, after the treatment, they felt more confident in doing the test since they knew how to read faster and more effectively. There from, to them, reading was not difficult any more.

### CONCLUSION

This research aimed at finding out the effectiveness of mind maps technique on improving the students' reading skills and their attitude towards reading and mind maps technique.

Before the treatment, it can be seen that the English competence of both experimental class and control class

was almost equal as the pre-test mean score shows that there was no disparity between the two classes. The score of experimental class was 56.33 while the control class was 55.48. However, after the treatment, the post-test mean score of both classes was significantly different. The experimental class' score was 66.67, meanwhile, the control class' score was 59.68. Besides, the results of the t-test of the gained scores also expressed there was a significant difference of the post-test score of the experimental class, which was higher than the that of the control class. Therefore, mind maps have a positive effect on improving the reading skills of the students at Dong Nai Technology University.

Moreover, the statistical analysis in the questionnaire also presented the differences before and after the treatment. In each statement, the number of students who agreed has increased significantly, which showed the attitudes of the students had changed significantly after they had learnt about mind maps. Before that, most of them never have the habit of reading books, magazines and materials in English. They could not easily get the general ideas of the text so they often feel bored with reading lessons at school. After learning about mind maps, they knew how to read faster, how to get the main ideas quickly and how to comprehend the text in the best way. Finally, they feel reading was not still hard anymore and feel more confident in reading.

#### Implications

The results of this study have proved that mind map technique could improve the students' reading skills. Once, their skills were improved, they could comprehend the text they read and take the information easily. It is believed that the mind map technique could attract the students in reading and motivate them in the classroom activities. Therefore, the teacher should use this technique not only in English but in other subjects as well because it has many benefits for the teaching and learning process.

#### Limitations and suggestions for further studies

The results of this study showed that the researcher had been successful in applying mind maps to improve the students' reading skills. However, shortcomings were unavoidable. It means that, there is still some limitations need improving.

The first thing should be mentioned is the amount of student participating in this research. There are only 61 students took part in this study. It might be not sufficient enough for the researcher to have a precise evaluation.

The other thing is the limitation of time. The experimental teaching and learning just happened in a few weeks. It was

not long enough for the students to comprehend clearly about mind maps. They may need more time to have clearer lessons and deeper responses for the study. Then it makes the research more reliable.

Based on the results and the limitations above, it is expected that the result of the study may be beneficial for other researchers to continue conduct this study in other schools that have the same condition and the same problems. In addition, it is hoped that this study can be useful as a reference of other researchers.

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