THE USE OF MIND MAPPING TO TEACH READING COMPREHENSION

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Article Info	Abstract
Article History Received: February 2020 Revised: March 2020 Published: April 2020 **Keywords** Reading skills; Mind mapping;	The research was aimed at finding out the impact of using mind mapping toward students' reading comprehension. This study was classified as a quasi-experimental research design using two intact classes as an experimental and control group. The experimental group was treated using the mind-mapping technique, while the control group was subjected to conventional learning techniques. The sample of this study was the first-year students of Nabi' Nubu' Islamic Senior High School. The instrument of this study employed a reading test for students in both groups. The reading tests were distributed in the pre-test and post-test. The data analysis used descriptive and inferential statistics. The data were met the normal and homogeneous data. The result of the study showed that the mean scores of the experimental group (71.76) were higher than the control group (60.24) after treatment was given. Thus, the use of mind mapping has a significant effect on students' reading comprehension. It indicated that the technique can be an alternative technique to teach reading comprehension.

INTRODUCTION

English is a compulsory subject in many countries. In Indonesia, English is taught as a foreign language. It becomes part of the school curriculum. It is a vital tool for the learners in the global era who wish to communicate easily across nationalities for many years to come (Harmer, 2002: 2). There are four skills in learning English namely speaking, listening, reading and writing. Reading is one of the language skills should be studied and mastered by students to get information from the texts (Haerazi & Irawan, 2020). It was a language activity to attain information and knowledge. Reading is also taught at junior or senior high school in Indonesia. According to Imran, Firman, and Raudhatunnisa (2019), reading is an interactive process between a reader and a text. In this process, readers interact dynamically with the text as they try to elicit the meaning. Reading is classified as recognition of printed or written symbols, which serve as stimuli for the recall of meanings built up through the reader's past experience (Rachmawati, 2018). It has also been described as a process of translating alphabetical symbols into a form of language from which the native speaker has already derived the meaning (Bond, 1984: 02).

According to Maxom (2009: 139), reading is one of the key skills in language learning. Reading skills reinforces other language skills such as speaking, listening and writing (Haerazi, Prayati, & Vikasari, 2019). It is also a complex cognitive process of decoding symbols in order to construct or derive meaning. Snow (2002: 11) asserts that reading is a means of language acquisition, of communication, and of sharing information and ideas. It is in line with Novita (2018) who argues that a complex interaction between texts and readers is shaped by readers' prior knowledge, experiences, attitude, and language community. The reading texts also are shaped by the speakers of the target language culturally and socially

situated (Haerazi, Vikasari, & Prayati, 2019). Therefore, the reading process requires continuous practice, development, and refinement.

Reading helps people to not only get access to more language input but gain more knowledge concerning the world as well. It is the prominent method for learning new information and has the capacity of opening up new ways of perceiving the world and transforming the world (Grabe and Stoller, 2001; in Hsu, 2010: 11). For EFL learners, reading is an essential method for independent obtaining information from other countries. Even though the majority of people learn to speak before they learn to read or write, most people have more needs and chances to read than to speak in learning second and foreign language (Goodman, 1986; in Hsu, 2010: 11).

There are some problems with reading instruction namely methods, content, vocabulary, instructional materials, environment, ineffective instruction, lack of motivation, grammatical features, and language features. Those issues cause the students to experience difficulties in reading English texts (McNamara, 2007: 199; Harmer, 2002: 205; Lenski and Lewis, 2008: 42-43). It is impossible to discuss all of the problems. Due to the limited time, capability and fund, this study is only concerned with investigating the use of mind mapping on teaching reading.

Review of literature
Mind Mapping Technique

Mind mapping is popularized by Buzan in 1964. It is a chosen instrument that may help a person to share one's memory. It is one of the techniques that can improve the English ability of the students. The picture below is an example of mind mapping. It is a useful technique that helps the students to learn more effectively and improves the way that we gain the information (2007: 19). Mind mapping is considered as a technique that could be used in constructivist language lessons because; it develops creativity and promotes individuals' learning. It can be used by hand and paper or computer. Using paper mind maps seem to be time-consuming because students need to erase many times and rewrite again and again (Erdogan, 2008).

There are some steps to make mind mapping. Firstly, place an image or topic in the center by using at least three colors. Secondly, use images, symbols, codes, and dimensions throughout the mind map. Thirdly, select keywords and print them using upper or lower case letters. Fourthly, each word/image is alone and sitting on its line. Next, connect the lines starting from the central image. The central lines are thicker, organic and flowing, becoming thinner as they radiate out from the center. Next, make the lines the same length as the word/image. Next, use a variety of colors throughout the mind map. Next, develop a personal style of mind mapping. Next, use emphasis and show associations in the mind map. Finally, keep the mind map clear by using radial hierarchy, numerical order, or outlines to embrace your branches. (Buzan 2007: 70).

According to Setianingsih, Rosihan, and Pardani (2018), mind mapping is based on imitating learners' thinking process in which they are asked to move from one topic to another topic back and forth. The process of recording information through symbols, pictures, or colors is the same as the process of learners' brains. Many researchers have a different focus when they use the mind mapping technique to improve students' language skills including reading skills. This technique also encourages students to utilize their thinking skills. Good readers need higher-order thinking activities to map their mind when they read a text. It is in keeping with Thamrin and Agustin (2019) who argue that reading activities need learning activities encouraging students to think higher-order thinking skills. Mind mapping can be designed to support students in reading activities. The complete of it can be seen in Figure 1 as follows.
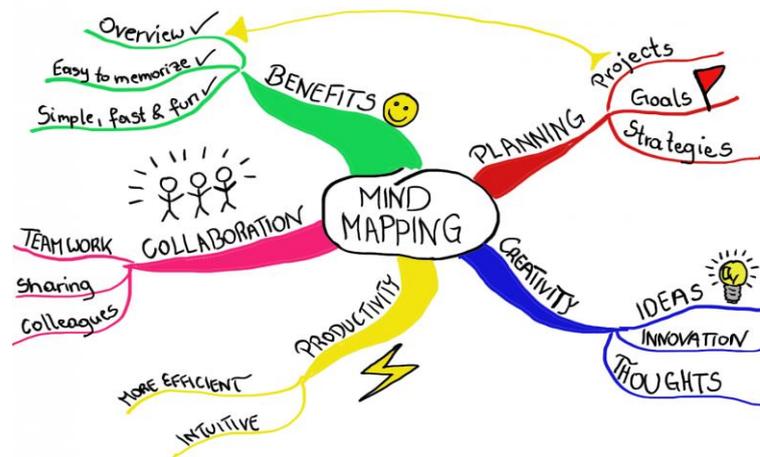
Figure 1. Mind Mapping Technique
Sources: (https://www.mindmeister.com/blog/why-mind-mapping/, 2019)

RESEARCH METHOD

Creswell (2008) asserts that quantitative research is a type of educational research in which the researcher decides what to study, asks specific, narrows questions, and collects quantifiable data from participants, analyzes these numbers using statistics, and conducts the inquiry in an unbiased, and objective manner. Ary et al (2010) define the experimental design as a general plan for carrying out a study with an active independent variable. The design is important because it determines the study's internal validity, which is the ability to reach a valid conclusion about the effect of the experimental treatment on the dependent variable.

Research Design

Creswell (2012: 309) states that quasi-experiment includes an assignment, but not a random assignment of participants to groups. It is because the experimenter cannot artificially create groups for the experiment. This study belongs to a quasi-experimental design. It involves the manipulation of an independent variable but differs in the subjects. It is not randomly assigned to treatment groups and does not provide full control (Ary et al, 2010: 316). Nunan (1992: 41) mentions that the quasi-experiment is a quantitative research that has both pretest and posttest and experimental and control groups, but no random assignment of subjects.

Population and Sample

In this study, intact classrooms were used as participants of the research. Class B was chosen as an experimental group and class A as a control group of the first-year students of Nabi' Nubu' Islamic Senior High School in the academic year 2019. Those groups were chosen after using two folds of papers which were named on each paper. Then all papers were inserted into a small glass. The researcher took the first paper as the experimental group and the second as the control group.

Instruments

The instrument of the study was reading tests. The tests were distributed in the pretest and posttest. The pre-test provides a measure on some attributes or characteristics that the researcher assesses for the participant in an experiment before the students receive a treatment (Creswell, 2012). The pre-test for this study was conducted at the beginning of the experiment in the first meeting before giving them a treatment. Meanwhile, the post-test is used to measure students' reading achievement after treatments (Creswell, 2012). The post-test for

this study was conducted after the treatments were done at the end of the experiment. It was aimed to know the students' reading achievement after they get the treatments.

Data Analysis

In this study, there are two data analysis techniques, namely descriptive and inferential statistics. Descriptive statistics indicate general tendencies in the data (mean, mode, median), the spread of scores (variance, deviation, range), or a comparison of how one score relates to others (Creswell, 2008). In this analysis, the interpretation was based on the mean and standard deviation. The data were computed by using SPSS 15 computer program. The inferential statistics was applied to analyze data from a sample to conclude an unknown population. It assesses whether the differences of groups or the relationship among variables are much greater or less than what the researcher expects for the total population if the researcher could study the entire population (Creswell, 2008). The inferential analysis includes the points of normality test and homogeneity test.

The requirement of using ANCOVA as a member of parametric statistics was that the data must be in the normal distribution. Regarding this issue, the researcher had to give evidence whether the data which have been analyzed had normal distribution or not. The test of normality was done by utilizing the Kolmogorov Smirnov test and the data were calculated by using SPSS 15 computer program. The homogeneity test is intended to find out whether or not the scores of one group have homogenous variance with the scores of the other groups. The researcher used Levene's test (Best et al., 2006) and the data were calculated by using SPSS 15 computer program. Besides, hypothesis testing is a procedure for making decisions about results by comparing an observed value of a sample with a population value to determine if no difference or relationship exists between the values (Creswell, 2012). In testing the hypothesis of the study, the researcher applied ANCOVA because a pre-test as a covariate (Creswell, 2008) and the data were calculated by using SPSS 15 computer program.

RESEARCH FINDINGS AND DISCUSSION

Research Findings

The study was carried out to investigate the use of mind mapping on teaching reading comprehension to the first-year students of Nabi' Nubu' Islamic boarding school. The results showed that there was a statistically significant difference between the experimental and control group. Table 1 presents the result of the pretest and posttest for both experimental and control groups.

Table 1
The Result of Pretest and Posttest

Methods	N	Mean		Standard Deviation	
		Pretest	Posttest	Pretest	Posttest
Experiment	17	62.35	71.76	6.9	6.553
Control	17	62.59	60.24	7.6	8.059

Based on the table above, the mean score of the experimental group was 62 and 72 with a standard deviation of 6.9 and 6.553. Meanwhile, in the control group, the mean score was 63 and 60 with the standard deviation of 7.6 and 8.059

Afterward, the researcher conducted a normality test to know whether the data were normally distributed or not. The computation showed that the data in the pretest and posttest for both experimental and control groups were normally distributed based on the calculation by using the SPSS 15 computer program. The result can be seen in Table 2 as follows.

Table 2
Test of Normality

Groups	Kolmogorov Smirnov Test			
	Pretest		Posttest	
	N	Sig.	N	Sig.
Experiment	17	0.168	17	0.101
Control	17	0.062	17	0.200

Hall (2010: 84) points out that if the *p-value* is higher than 0.05, it means that the data were normally distributed and *p-value* labeled as (Sig.). Based on the table above a Kolmogorov Smirnov test showed that the score for the experimental group (.168 and .101) was higher than 0.05 and for the control group the score (.062 and .200) was higher than 0.05. Thus, the data for both the experimental and control group were approximately normally distributed.

After knowing the data were normally distributed, the researcher conducted a homogeneity test to know whether it was homogenous or not by applying Levene's test. The researcher calculated the data by using SPSS 15 computer program. Table 3 presents the result of the homogeneity of pretest and posttest for both the experimental and control group.

Table 3
Test of Homogeneity of Variances

	Pretest			Posttest		
Levene Statistic	df1	df2	Sig	df1	df2	Sig
	1	32	0.589	1	32	0.758

If the probability is over 0.05 for Levene's test, variances are considered to be homogeneous (Hall, 2010: 88). In line with the result above, the *p-value* (0.589 and .758) was higher than 0.05. It can be concluded that the data for both the experimental and control group were homogenous. Both pretest and posttest are normal and homogenous. It was recommended to fulfill the assumption of ANCOVA.

In this study the hypothesis to be tested was as follows: Ho is stated there is no significant difference in reading achievement between the students who are taught by using mind mapping and that of the students who are taught by using another technique. Meanwhile, Ha is stated there is a significant difference in reading achievement between the students who are taught by using mind mapping and that of the students who are taught by using another technique. In this study, the ANCOVA formula was applied by the researcher and the data were calculated by using SPSS 15 computer program. The result of the calculation was as follows.

Table 4
Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1347,170(a)	2	673,585	13,839	,000	,472
Intercept	817,183	1	817,183	16,790	,000	,351
Pretest	217,288	1	217,288	4,464	,043	,126
Group	1146,132	1	1146,132	23,548	,000	,432
Error	1508,830	31	48,672			
Corrected Total	2856,000	33				

Table 4 shows that the *F* value (23.5) is greater than the *F* table (4.15) with a 5 % level in the degree of freedom was 32. It means that there was a significant difference in terms of reading achievement between the students who were taught by using mind mapping and that of the students who were taught by using the conventional technique. Thus, the null hypothesis was rejected. The students who used mind mapping created a network relationship linked with their cognitive connection. As the network relationships increased, the cognitive connection increased and supported learning.

Discussion

The research question of this study asked whether there was a significant difference in reading achievement between the students who were taught by using mind mapping and those who were taught by using another technique. This study found a significant difference. It was proved by the mean score of the experimental group (71.76) that was higher than that of the control group (60.24). The mean score of the experimental group increased by 9.41 points from 62.35 to 71.76. Meanwhile, the mean score of the control group decreased -2.35 points from 62.59 to 60.24. The F value (23.5) was higher than the F table (4.15) with a 5 % level in the degree of freedom was 32.

The finding of the study was similar to Alomari (2019) that conducted a study focused on using mind mapping techniques to improve the "reading comprehension ability of fourth-grade Arabic language students in Jordan". The results revealed a statistically significant difference between the two groups, in favor of the experimental group attributed to using electronic mind mapping. A review of the literature showed that the mind mapping technique has a positive impact on reading comprehension in the English language. Furthermore, utilizing mind mapping techniques in teaching and learning aids students in thinking skills, establishing relationships, analyzing, focusing and creativity. It is in line with Siriphanic and Laohawiriyano (2010) who found that the mind-map involves students to think and communicate information to become a simple one. It also leads students to conduct semantic mapping and helps students to activate their prior knowledge before doing reading activities (Zahedi & Abdi, 2012).

Mind mapping technique in terms of the thinking process, the teachers involve students with some a circle using texts. They are asked to write the topic of the text and draw it in circle form. In doing so, students utilize their background knowledge to do this activity. This activity looks effective to activate their thinking before reading. Khatimah and Rachman (2018) state the mind mapping technique can improve students' reading and writing skills because before reading students are asked to do writing exercises. For instance, in the discussion session, they are asked to draw a branch of the initial topic they discuss. Then, they continue to write some keywords or phrases from the text presenting a storyline on the branches. In practice, students conduct two kinds of activities, writing and reading activities.

Students in mind mapping activities can improve their writing and reading skills as well. In writing activities, students also are reinforced with various reading texts. Writing and reading skills are inseparable (Haerazi et al., 2020). It is in keeping with Rubiyah et al. (2019) who conduct a study using concept mapping techniques to improve students' descriptive writing ability. The results of the writing assessment in cycle 1 revealed that the students' mean score increased to 7.35 points or 11.27%. It was improved from 65.22 in preliminary assessment to 72.57 at the end of cycle 1. This result was moderate, but unfortunately, the criteria of success had not been achieved yet. There were only seventeen students who gained the score 75 and above and twenty students were failed.

CONCLUSION

There was a significant difference between the scores of the students who were taught by using mind mapping and those of the students who were taught by using another

technique. It was proved by the different mean of the score of the experimental group (71.76) and the mean of the score of the control group (60.24) with mean difference 11.6. The F value (23.5) was higher than the F table (4.15) with a 5 % level in the degree of freedom was 32.

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