The Using of Mind Mapping Technique in Improving Students' Reading Comprehension

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Abstract. This research is entitled The Use of Mind Mapping Technique to Improve Students' Reading Comprehension. This research is an experimental study and uses quantitative research, the researchers conducted this research in class X MIPA as an experimental class and class X IPS as a control class. To obtain data, researchers conducted experimental learning for five meetings. The instrument used to collect data in this research was a written test. The test was pre-test and post-test. The pre-test was given before the writer treated the students by using the "mind mapping technique", to determine the students' ability to master reading skills. The post-test was given after the researcher conducted a teaching experiment. This research was conducted to determine the extent of students' understanding of reading comprehension using Mind mapping. The results showed significant differences between students who were taught by using Mind mapping and students who were taught by other methods (reading only). The study was found by comparing the pre-test and post-test of each experimental and control class. Based on the data obtained, the researcher found that their reading skill were significantly different after being taught using Mind mapping; they are also interested in the learning process. The data collection showed that their experimental class had a total score of 12,075, while the control class had a total score of 3,475. The average value of the experimental class was 22 and the average value of the control class was 10.7. It showed that the average difference in the scores of the experimental class was higher than the control class (22>10.7). While the result was 22. Therefore, it is higher than (22> 0.049). That is, accepted. This shows that the student's ability to read has increased after learning mind mapping.

Keywords: Mind Mapping, Reading Comprehension

1   Introduction

English serves as a vital international language, playing a significant role in various aspects of human life. It is recognized as one of the most crucial foreign languages and is extensively utilized by individuals across the globe. In Indonesia, English is commonly employed for communication in diverse settings, including workplaces, educational institutions, and homes. It is not uncommon for mothers to instruct their children

in English communication. Furthermore, proficiency in English encompasses several skills, namely speaking, writing, listening, and reading, with reading skills being particularly essential in the educational landscape.

In the context of English language education in Indonesia, reading holds a pivotal position for students, as evidenced in academic settings. Students are anticipated to develop the ability to comprehend and produce various short functional texts and essays, including procedural, descriptive, recount, narrative, and report formats. This underscores the necessity for students to possess strong reading skills to effectively grasp their learning materials. To extract the intended messages or information from texts, students must employ suitable reading strategies. Reading demands higher-order thinking skills and is inherently more intricate than merely decoding individual words, especially since English is a subject featured in the National Examination. Consequently, reading is of utmost importance, as a majority of the questions in the National Examination focus on reading comprehension. To succeed in this examination, students must be adept at answering these comprehension questions. Thus, the English teaching and learning process in Indonesia places a greater emphasis on reading.

Reading is essential for students, as their success in learning is closely linked to their reading abilities. Poor reading skills can significantly hinder their academic performance, while strong reading skills enhance their chances of success.

From the researcher's observations, many students struggle with comprehending the content of texts, which diminishes their interest in reading. These students require innovative approaches and motivation to foster a conducive learning environment. A significant number of students exhibit low reading comprehension levels, making it challenging for them to draw conclusions and grasp the material they encounter. When assigned reading tasks, many students fail to understand the text due to unfamiliarity with the vocabulary. Additionally, teachers often employ monotonous instructional techniques, leading to student disengagement and inadequate comprehension. To cultivate a greater interest in learning, particularly in text comprehension, educators should implement diverse and engaging teaching strategies that capture students' attention and enhance their learning experience.

In light of the aforementioned circumstances, the researcher proposes a pedagogical approach aimed at addressing the identified issue. Mind mapping is presented as an effective teaching strategy to enhance reading comprehension. This technique has been found to facilitate students' understanding of texts, making it one of the more accessible methods for grasping content. Furthermore, the mind mapping technique is recognized for its potential to enhance reading comprehension skills. Popularized by Buzan in 1964, he asserts in his 2007 work (p. 19) that "Mind-map is the chosen instrument that could help a person to share the memory." This implies that students can more easily retain vocabulary and sentences found within the text. As a valuable tool, mind mapping aids students in learning more efficiently and improves their information retention methods. In this research, the investigator has explored the application of mind-mapping techniques among students, as indicated by the study titled "The Use of Mind Mapping Technique to Improve Students' Reading Comprehension."

2   Literature Review

2.1   Mind Mapping

The mind mapping technique, as articulated by Astuti in her thesis [1], serves as a significant method for enhancing note-taking and fostering creative problem-solving abilities. This approach enables readers to distill the information they have encountered, facilitating a clearer understanding of the author's message. The visual representation derived from a text encapsulates both detailed and essential information, allowing readers to retain and comprehend the material more effectively. According to Potter and Hernacki [2], mind mapping engages the entire brain by incorporating visuals and graphics, thereby creating a more impactful learning experience. This holistic engagement balances the functions of both the left and right hemispheres of the brain, empowering individuals to harness their cognitive capabilities for meaningful creation.

Although the concept of mind mapping has been around for several decades, it gained widespread recognition through Tony Buzan in the 1960s. His primary goal was to enable users to organize and retrieve conceptual information with greater efficiency. The open and fluid structure of mind mapping aligns with the brain's natural thought processes, which tend to be random and nonlinear, making it a superior alternative to traditional note-taking methods. Buzan emphasized that concept maps or mind maps are innovative, effective, and literate techniques that effectively "map" cognitive processes.

2.2   Reading

Reading is an intricate process that establishes a connection between the writer and the reader. This interaction is unidirectional, wherein the writer conveys their intent through the text, and the reader engages with the text to discern that intent. Reading involves the reader's interaction with the text, which includes making predictions and integrating their own knowledge with the content [3]. This sentiment, asserting that reading is fundamentally an interaction between the reader and the text. He elaborates that during this process, the reader not only examines the text but also contemplates its meaning and seeks to relate the information presented. This phenomenon is referred to as the nature of reading [4].

Furthermore, characterize reading as "the ability to draw meaning from the printed page and interpret this information appropriately. Both definitions highlight the multifaceted nature of reading, which encompasses the engagement with written or printed material and the cognitive processes involved in accurately interpreting that information [5]. Then, effective reading comprehension is contingent upon the reader's purpose for engaging with the text [6].

2.3   Reading Comprehension

Reading extends beyond merely pronouncing words; it encompasses a more intricate process. Reading is a fluid activity that enables readers to derive meaning by integrating textual information with their own prior knowledge. He further emphasizes that the primary objective of reading is to achieve comprehension [7].

Moreover, reading comprehension entails far more than the responses of readers to the text. It is a multifaceted and complex process characterized by numerous interactions between readers and the text, influenced by factors such as prior knowledge and strategic approaches, as well as text-related variables like interest and comprehension of different text types [8]. Reading comprehension as the ability to understand a text, describing it as a process of meaning construction. This process is termed a "construction process" because it incorporates all elements of the text within the reader's cognitive framework.

3   Methodology

In this study, the researcher selected two first-year classes from SMA Negeri 2 Indrajaya, designating one as the experimental group and the other as the control group. The experimental group was instructed using the "mind mapping technique," while the control group received instruction through an alternative method. A written test served as the primary instrument for data collection. The research was conducted over five sessions, each lasting 90 minutes. Data was gathered through a series of assessments, including a pre-test and a post-test. The pre-test was administered at the outset of the study to evaluate the students' initial reading proficiency in English before the implementation of the technique, while the post-test was conducted after the study following the application of the technique.

The population for this research comprised all first-grade students at SMA Negeri 2 Indrajaya during the academic year 2020. The total number of first-grade students was 40, divided into two classes, with the experimental class consisting of 20 students and the control class comprising 19 students.

A sample is defined as a subset of the population under observation. In this study, since the population consists of only two classes, the researcher has opted to include the entire population as the sample. This encompasses class X MIPA 1 and class X IPS 1, each comprising 20 students. The selection of the experimental or control class was conducted randomly. Class X MIPA 1 was designated as the experimental group, consisting of 20 students, which included 9 boys and 11 girls. Conversely, class X IPS 1 was selected as the control group, comprising approximately 19 students, with 10 boys and 9 girls.

Following the administration of the pre-test and post-test, the scores from all assessments were organized into a frequency distribution and analyzed using the mean. The mean serves to determine the average score of all students' pre-test and post-test results in the experimental group. The formula for calculating the mean is as follows:

3.1   Mean

The mean represents the average derived from the total scores of students divided by the number of respondents. The formula is:

$$Mx = \frac{\Sigma}{N}$$

Where:

Mx	: Mean
N	: Number of Scores
Σ	: Sum or Add

3.2   Calculate the Test Score

To calculate the statistical significance of the ratio observed, the researchers used the following formula shown by Suharsimi Arikunto (2002: 281).

$$t = \frac{Mx - My}{\sqrt{\left(\frac{\Sigma x^2 + \Sigma y^2}{Nx + Ny - 2}\right)\left(\frac{1+1}{Nx + Ny}\right)}}$$

To assess the extent to which the Mind Mapping technique could enhance students' reading skills, the researcher calculated the total score achieved. To facilitate this assessment, the researcher established specific criteria. Following the evaluation of the students' answer sheets, the researcher categorized the scores according to the framework proposed as follows:

Table 1. The results of students' answer

No	Controlled Class					Experimental Class				
	Subject initial (x_1)	P re-test (x_1)	Post-test (x_2)	Gain (d_x)	$(d_x)^2$	Subject initial	Pre-test (y_1)	Post-test (y_2)	Gain (d_y)	$(d_y)^2$
1	T	45	45	0	0	MJ	40	70	30	900
2	CF	50	60	10	100	RT	55	60	5	25
3	FA	55	60	5	25	HA	45	60	15	225
4	MR	30	35	5	25	NA	45	60	15	225
5	UH	25	40	15	225	SM	45	70	25	625
6	NE	30	40	10	100	MA	40	50	10	100
7	MA	10	30	20	400	UA	50	65	15	225
8	MSY	5	10	5	25	MT	20	50	30	900
9	AC	20	40	20	400	MR	40	70	30	900
10	SM	30	40	10	100	RA	40	65	25	625
11	F	10	30	20	400	UH	30	50	20	400
12	MA	35	45	10	100	FH	40	60	20	400
13	ML	55	65	5	25	MJ	40	55	25	625
14	RD	50	55	5	25	ML	30	60	30	900
15	NS	5	15	10	100	HN	20	60	40	1.600
16	WA	50	70	30	900	MS	40	60	20	400

17	SD	40	60	20	400	JS	35	65	30	900
18	NS	55	60	5	25	MR	50	70	20	400
19	AM	60	60	0	0	NS	20	60	40	1.600
						RM	45	55	10	100
	N = 19	66 / 0	860	205	X_1 3475	N = 20	5.225	7.155	44 / 0 / 5	X_2 12.07

Afterward, from the table above the researcher got the calculation using that formula designed as follow:

a. Determining mean controlled class score with the formula:

$$Mx = \frac{\Sigma d_x}{N} = \frac{205}{19} = 10,7$$

b. Determining mean experimental class score with the formula:

$$My = \frac{\Sigma d_y}{N} = \frac{440}{20} = 22$$

c. Determining the deviation of controlled class:

$$\Sigma x^2 = \Sigma d_x{}^2 - \frac{(\Sigma d_x)^2}{N}$$
$$\Sigma x^2 = 3.475 - \frac{(205)^2}{19}$$
$$\Sigma x^2 = 3.475 - \frac{42.025}{19}$$
$$\Sigma x^2 = 3.475 - 2.211,8$$
$$\Sigma x^2 = 1.263,2$$

d. Determining the deviation of experimental class:

$$\Sigma y^2 = \Sigma d_y{}^2 - \frac{(\Sigma d_y)^2}{N}$$
$$\Sigma y^2 = 12.075 - \frac{(440)^2}{20}$$
$$\Sigma y^2 = 12.075 - \frac{193.600}{20}$$
$$\Sigma y^2 = 12.075 - 9.680$$
$$\Sigma y^2 = 2.395$$

3.3   Hypothesis testing

The Steps will be continued by calculating or comparing both the calculation results of the previous calculation result. It is obtained by mean and deviation scores each class as follows:

$$Mx = 10, 7$$
$$\Sigma x^2 = 1.263,2$$

My   = 22
$\sum y^2$ = 2.395

The value of the t-test obtained:

$$t = \frac{Mx - My}{\sqrt{\left(\frac{\sum x^2 + \sum y^2}{Nx + Ny - 2}\right)\left(\frac{1 + 1}{Nx + Ny}\right)}}$$

$$t = \frac{22 - 10,7}{\sqrt{\left(\frac{1.265,2 + 2.395}{19 + 20 - 2}\right)\left(\frac{1 + 1}{19 + 20}\right)}}$$

$$t = \frac{11,3}{\sqrt{\left(\frac{3.660,2}{37}\right)\left(\frac{1 + 1}{39}\right)}}$$

$$t = \frac{11,3}{\sqrt{98,9 \times 0,05}}$$

$$t = \frac{11,3}{\sqrt{4.945}}$$

$$t = \frac{11,3}{4.9} = 2.3$$

Based on significance level α = 0.05 degrees of freedom d.f = (Nx+ Ny – 2) = (19 + 20 – 2) = 37, then from the distribution list t with probability 0.95 and df = 37 to obtained by interpolation t0,95(37) = 0,049. Hypothesis testing is done on a significant level level α = 0.05 degrees of freedom d.f = (Nx+ Ny – 2) = (19 + 20 – 2) = 37, with the odds (1 – α).

To test the hypothesis that the statistics used are the t-test, and for the formula that will be tested as follow:
Ha : μ1 > μ2 Ho : μ1 = μ2
It means that sounds:

H_a :   There was a significance different between the students who are taught by using Mind mapping technique to improve reading comprehension and who are do not taught with using Mind mapping technique was accepted.

H_0 :   There was no significance different between the students who are taught by using Mind mapping and who are not taught with Mind mapping was rejected.

Based on the results above, it is obtained t = 2.3 and t-table = 0.049,so t0>t-table (2.3> 0.049). Ha is accepted with a significant level α = 0,05. It can be concluded that "The Use of Mind Mapping Technique to Improve Students Reading Comprehension" was accepted and the null hypothesis (H0) was rejected.

4   Discussion

Following the research conducted at SMAN 2 Indrajaya, the findings indicate a notable enhancement in the reading comprehension skills of the students. The experimental group, which utilized Mind Mapping as a treatment method, exhibited positive reactions characterized by increased interest, enthusiasm, and motivation. The implementation of Mind Mapping in the experimental class yielded superior outcomes when compared to the control group. Students who engaged in group discussions achieved higher post-test scores than those who did not receive instruction through Mind Mapping. Specifically, the experimental class attained a cumulative score of 440, whereas the control class recorded a total score of 205. This data suggests that the reading comprehension levels in the experimental class surpassed those of the control class.

Furthermore, the hypothesis testing conducted using the t-test formula revealed that the t-test value exceeded the critical value (t0 > table (2.3 > 0.049)). This finding underscores the significant differences in reading comprehension among students prior to the implementation of the Mind Mapping technique. The necessity of employing Mind Mapping in teaching reading comprehension is evident, as it fosters student engagement and provides opportunities for learners to articulate their ideas collaboratively in group settings, thereby promoting a more student-centered approach to the teaching-learning process.

5   Conclusion and Suggestion

The application of the mind mapping technique among first-year students at SMAN 2 Indrajaya has yielded significant findings. This research indicates a notable difference in reading comprehension between students instructed in English using mind mapping and those taught through alternative methods. The results suggest that the implementation of mind mapping is beneficial for enhancing students' reading comprehension skills. This conclusion is supported by the comparative analysis of pre-test and post-test scores from both the experimental and control groups. The experimental group achieved a total score of 440, while the control group scored 205. The mean score for the experimental group was 2.395, in contrast to the control group's mean score of 1.263. This demonstrates that the experimental group outperformed the control group, as evidenced by the mean difference (2.395 > 1.263). Furthermore, the statistical analysis confirmed that the experimental group achieved higher scores than the control group, reinforcing the effectiveness of mind-mapping techniques in enhancing reading comprehension. The experimental group, which utilized mind mapping, demonstrated superior results compared to the control group that did not employ this technique.

In light of these findings, the researcher proposes several recommendations to further enhance the reading instruction process.

    a. In the context of English language teaching, educators should adopt a more professional approach to reading instruction. This can be achieved by employing a

variety of methods and techniques to foster greater student engagement in reading activities.

b. The researcher should select appropriate materials that align with the chosen methods to c. The researcher ought to encourage students to engage actively in all classroom activities.

c. The researcher should implement an engaging and effective teaching method or technique for the students.

d. The researcher also recommended that by mastering the subject matter, they can demonstrate effective performance during the teaching-learning process.

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