

The Effect of the Mind Mapping Strategy on Improving Critical Reading Skills: A Study of Grade Ten EFL Students from Akkar, Lebanon

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Citation: Khoder, M. M. (2024). The effect of the mind mapping strategy on improving critical reading skills: A study of grade ten EFL students from Akkar, Lebanon. *Gloria: International Multidisciplinary Studies*, 1(1), 59-77. <https://gloria-leb.org/MindMapping.htm>

Abstract

This study ventures into a unique realm of research, delving into the effectiveness of the Mind Mapping Strategy (MMS) in enhancing critical reading skills. It specifically hones in on two crucial skills-scanning and skimming, and making inferences. The research not only aims to define the theoretical concept of MMS and the essential skills of reading but also to evaluate their interrelationship. Conducted as a quasi-experimental study, it utilizes pre-posttests to collect data from grade ten students in a public school in North Lebanon. The sample consists of approximately 50 students, divided into an experimental and a control group. Descriptive statistics are used to compare the performance of both groups in the pre and post-tests. The results highlight a significant difference between the control and experimental groups in the recall scores of the post-test. The findings of this study are expected to shed light on the current landscape of critical reading skills instruction and determine whether mind mapping is an effective strategy. Ultimately, the research aims to equip teachers with evidence-based practices to better support students in developing essential critical reading skills, thereby preparing the students to be better critical readers in schools and the real world.

Keywords: Critical Reading, Mind Map, Mind Mapping Strategy, Making inferences, Skimming and Scanning

الملخص

إن إستراتيجيات القراءة ضرورية جدا للنجاح الأكاديمي والتطور اللغوي عند المتعلمين. بناءً على ذلك تسعى الدراسة الحالية إلى التحقق من فعالية استخدام إستراتيجية الخريطة الذهنية لتطوير مهارة القراءة النقدية عند طلاب الصف العاشر في إحدى المعاهد الرسمية في شمال لبنان، ويهدف هذا البحث أيضاً إلى مناقشة المفهوم النظري للخريطة الذهنية ومهارات القراءة النقدية وتوضيح العلاقة بينهما. ولتحقيق هذا الهدف، فقد تم الاعتماد على تقسيم الطلاب إلى مجموعتين، المجموعة الأولى (25) تلميذاً وتشكل المجموعة التجريبية والمجموعة الثانية (25) تلميذاً واعتبرت مجموعة التحكم، وقد خضعت المجموعتان لامتحان قبلي وبعدي كأدوات لجمع البيانات وذلك للتحقق من صحة الفرضيات والنظريات المطروحة. وكشفت النتائج أن هناك فرقاً واضحاً بين أداء المجموعتين لجهة

تحقيق المجموعة التجريبية نتائج أفضل بكثير من مجموعة التحكم. من المتوقع لنتائج هذه الدراسة ان تسلط الضوء على تعليم مهارات القراءة النقدية والتحقق مما إذا كانت الخريطة الذهنية فعالة في هذا المنحى. تهدف هذه الدراسة ايضاً الى تسليح المعلمين بممارسات مثبتة علمياً بالتجربة لمساعدة تلامذتهم في تطوير مهارات القراءة النقدية وتحضيرهم ليكونوا قراءاً نقديين داخل وخارج إطار المدرسة.

Introduction

Mind Mapping, a teaching method that stimulates students to utilize their entire brain when thinking, holds immense promise for enhancing students' learning experiences. Mind mapping has gained traction in schools, industries, and governments for its ability to foster creativity. Mind Maps, with their critical features, have been proven to help people unlock their creative potential. According to Peng (2011), a Mind Map integrates language, words, logical operations, and analysis on one hand and creativity, imagery, creation, and imagination on the other, offering a promising approach to learning.

Based on the researcher's experience in teaching English as a foreign language in public schools and technical institutes in North Lebanon, some students have displayed poor critical reading skills regarding text analysis, summary writing, making inferences, reaching conclusions, and many other areas.

Critical reading abilities are a crucial area for improvement at the undergraduate level. A study conducted by Zing, Eng, and Rafik-Galea (2014) revealed that the level of critical reading skills of the students, as measured by their analytical and inference skills, is subpar, indicating a lack of the desirable higher-order thinking skills required for the tertiary level. In their pilot study, Khodary and Abdallah (2014) found that students lack critical reading skills, particularly the ability to identify the main ideas of passages where they are not explicitly stated, detect the author's purpose, guess the meaning of words in context, and make inferences. Therefore, it is recommended that students be engaged in more activities to evaluate and develop critical thinking. This study delves into whether the Mind Mapping Strategy (MMS) can be harnessed as one of the practical strategies to assess the Critical Reading Skills of Grade Ten students. As a result, the purpose of this study is to examine whether the Mind Mapping Strategy (MMS) can help students improve their Critical Reading Skills (CRS), specifically the ability to scan and skim a passage of English to find the main and supporting ideas, and the ability to detect clues to make inferences.

Literature Review

Mind Mapping Strategy

The term "Mind Mapping" was first used by Buzan in 1993, and according to him, mind maps reflect the learner's cognition and comprehension and are a fantastic tool for assisting students in expressing themselves verbally and visually. According to McGriff (2007), "Mind maps are an excellent way to help learners

organize knowledge to empower themselves to comprehend better the key concepts and principles in lectures, readings, or other instructional materials". Figure 1 (<https://www.mindmeister.com/blog/mind-map-examples/>) is a simple template of a mind map.

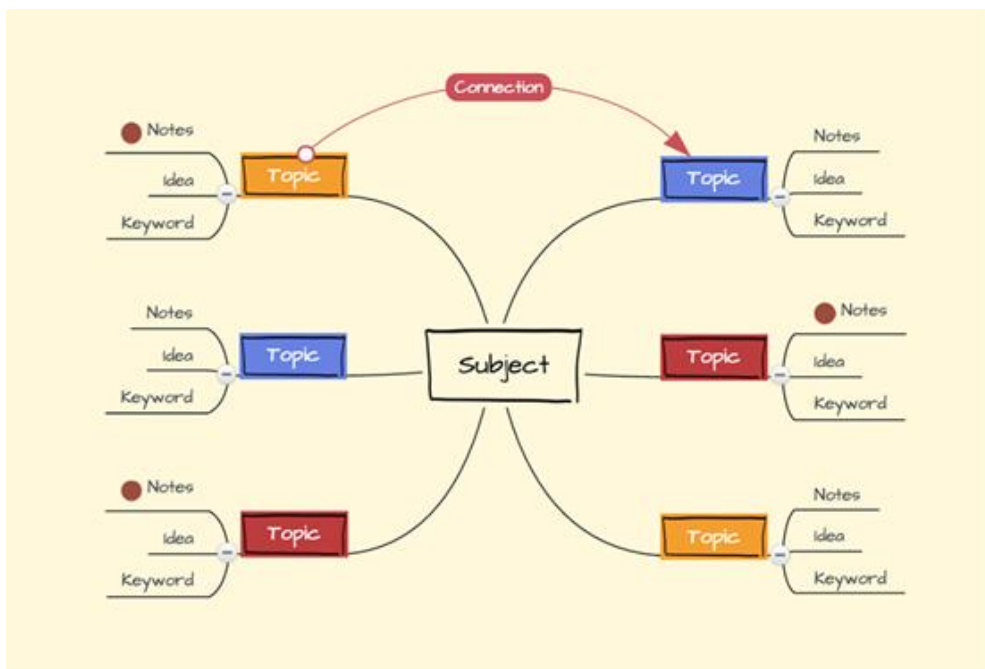


Figure 1: Mind Map Template

Critical Reading Skills

Students must learn to read critically and analytically to get the most out of their reading materials. Teele (2004) asserts that the goal of all readers should be to understand what they read. Good readers are engaged with the text and are aware of the strategies they employ to comprehend what they read. Teachers can assist students in increasing their comprehension by teaching them specific reading skills. Predicting, scanning and skimming, visualizing, inferring, questioning, and summarizing are strategies proved by research to improve reading comprehension, according to Block and Israel (2005).

According to Hudson et al. (2007), reading skills can be divided into four broad categories. *Word attack* skills help students learn to convert orthographic symbols into language. *Comprehension skills*: these skills help students use context and knowledge to derive meaning from what they read. *Fluency skills*: These skills help students develop abilities such as sight word recognition, recognizing high-frequency letter clusters, rapid reading, and possessing an extensive vocabulary. *Critical reading skills* help students analyze, synthesize, and evaluate what they have read. However, to acquire these skills, students must be exposed to and

taught how to be critical readers. Rosenshine (1980) concludes that reading involves at least seven sub-skills across the essential reading skills. The seven sub-skills are:

- Recognizing sequence.
- Recognizing words in context.
- Identifying the main idea.
- Decoding detail.
- Drawing inferences.
- Recognizing cause and effect.
- Comparing and contrasting.

Therefore, it is imperative for teachers to stress these seven sub-skills when teaching reading to prepare students to be critical readers in the future.

Critical reading skills are multifaceted and can be honed through various strategies. Due to the limited time and capacity, this study focuses on investigating whether the Mind Mapping Strategy (MMS), a creative and logical means of note-taking that maps out our ideas, can be one of the practical strategies to enhance two critical reading skills. These skills are scanning and skimming an English passage, finding the main and supporting ideas, and detecting clues to make inferences. By exploring the potential of MMS in this context, the study aims to provide educators with a new tool to support students in developing these essential critical reading skills.

Scanning and Skimming an English Passage to Find the Main and Supporting Details

Scanning is a reading strategy the reader uses while looking for specific information or details. Blanchard and Root (2005) viewed scanning as another way to read quickly, in which the reader moves their eyes quickly across the text to locate a name, a date, a time, or a keyword. That is to say, scanning is useful when the reader needs to find a specific piece of information in the given passage. Furthermore, Harmer (2007) pointed out that readers are in need to use such a strategy in which they can scan the text for particular bits of information they are searching for, such as looking for a telephone number or searching quickly through an article, looking for a name or other details.

Skimming is one of the most often used skills when reading. Blanchard and Root (2005) stated that skimming is a way to read quickly to discover the general idea of the text. The reader does not need to read the entire text; instead, he or she moves his or her eyes quickly around the text, skipping certain lines or phrases and focusing solely on others to gain a basic comprehension of the section. To make reading effective through skimming, Mikulecky and Jeffries (2005) suggested the four following guidelines:

- Reading the first sentence or two at the usual speed, asking, "What is this about?"

- As soon as guessing the general idea, go to the next paragraph, remembering that there is no need to know the details. There is only a need to learn something very general about the passage;
- Reading only a few words in each paragraph, then looking for the words that tell the general idea (often those sentences are at the beginning of the paragraph or may also be at the end); and
- Working quickly and remembering that details are not necessary.

Detecting Clues to Make Inferences

Blanchard and Root (2005) asserted that inference is an educated guess based on information in the reading. Similarly, Mikulecky and Jeffries (2005) stated that inferencing, sometimes called "reading between the lines," is an act in which the reader uses the information to guess other things about the text. That is, the reader must connect the paragraph's clues to information from his or her own experiences. In other words, the writer does not necessarily describe every detail pertinent to the subject; instead, the reader is supposed to use his or her ability to comprehend what was read. Students use past information to construct new meanings or draw conclusions that are not clearly expressed in the reading material. Hall and Barnes (2017) emphasize this idea, saying that making inferences during reading is a critical standards-based skill and is essential for reading comprehension. Hall and Barnes (2017) identified two types of inferences. The first type is called "text-connecting" inferences. In this kind, the reader makes inferences by establishing meaningful connections between various information stated in the text. The second type, called "knowledge-based" or "gap-filling" inferences, refers to inferences the reader makes by establishing meaningful connections between information literally stated in the text and the reader's background knowledge. In addition, teachers might ask students about their past experiences and demonstrate how to conclude the text by activating their existing knowledge and integrating it with the text's content.

Relationship Between Mind Mapping and Critical Reading Skills

Reading has been the focus of most research studies for the past decades. According to Malekzadeh and Bayat (2015), reading is a complex activity that involves both perception and thought and allows us to interpret a particular message to gain information from a text. Reading, therefore, is an active activity that requires skill and cognitive ability to understand messages. Critical reading, however, is a more active way of reading, and according to Duncan et al. (2014), it is much more complex than reading in the sense that critical reading is not just a process of interpreting the text's message. Still, it also analyzes and evaluates the said text. Leicester University (2009) describes critical reading as examining the evidence or arguments presented, checking out any influences on the evidence or arguments, checking out the limitations of study design or focus, exploring the interpretations made, and deciding to what extent the reader is prepared to accept the authors' arguments, opinions, or conclusion.

Previous research has shown that visual aids like mind maps and other graphic organizers are effective in helping students get a better grasp of the content, structure, and concepts of a text (Birbili,2006). Visual aids, as cited by Yunus, Salehi, and John (2013), help students to understand the conceptual prospect of the text. Moreover, they create a real relationship between the readers and the text. They make the reading process quicker and livelier.

Various studies have attempted to incorporate the use of the mind-mapping strategy to improve critical reading skills at different levels. Bukhari (2016) concluded that mind maps allow gathering concepts about the main theme as they present information using images, symbols, keywords, codes, and colors according to various levels. In his study on the impact of electronic mind mapping on the development of Arabic language reading comprehension in fourth-grade children in Jordan, Alomari (2019) revealed that electronic mind mapping developed students' comprehension skills because it helped students to focus on the basic ideas and sub-ideas of the text, make use of their own experiences, and come up with their idea. A quasi-experimental research design with pre-test and post-test control groups was employed in this study. The experimental group received computerized mind mapping education, whereas the control group received traditional classroom teaching. Another study was conducted by Ellozy and Mostafa (2010) to explore whether the Mind Mapping Strategy is a powerful active learning tool that develops the critical reading skills of first-year Egyptian students. Seventy students participated in the study, and data were collected over two semesters. E-maps were used to assess learning. Results show that E-mapping effectively enhances critical thinking and helps students acquire visual skills. They also found that it is an assessment tool that permits instructors to gain insight into their students' analytical and synthetic skills.

The study by Qasrawi (2015) discussed the effectiveness of using the context clues chart strategy in developing students' vocabulary knowledge and studied the strategy's effectiveness in equipping students with tools they might use in inferring the unknown words' meaning from the context. The study adopted the quasi-experimental design methodology. The study sample comprised 40 students from a Mohammad Bin Rashid Al Maktoum Private School in Ramallah, Palestine. They were assigned randomly into two groups (experimental and control). A pre-posttest was used as a tool of the study. The study results showed that context clues teaching strategy enhanced students' vocabulary knowledge. Students also improved their ability to infer the meaning of unknown words.

These studies emphasized the meaningful effects of mind mapping on reading skills and suggested that critical reading should become a part of foreign language teaching and learning. English teachers or instructors should design appropriate teaching activities to encourage students to develop critical reading skills. Mind Maps would help students identify relevant information within assigned texts. They are a good technique for solving students' reading problems.

This study attempts to answer the following questions:

- 1- How does the Mind Mapping Strategy affect students' ability to scan and skim an English text to find the key details and supporting details?
- 2- How does the Mind Mapping Strategy affect students' ability to detect clues to make inferences?

Research Method

Research Design

The study adopted the quasi-experimental design, which suits the nature of the research, finding the effect of the independent variable (mind mapping) on the dependent variables (scanning, skimming, and making inferences). Creswell (2012) states that quasi-experiment includes an assignment, but not a random assignment of participants to groups. This is because the experimenter cannot artificially create groups for the experiment. Two groups were chosen for this study: the experimental group, which studied using the mind mapping strategy, and the control group, which was taught conventionally or traditionally.

Participants

The participants are 50 students with an average age of 16. A random selection of participants is used. Participants are selected from the school lists as they are available in the public sector. They are all pre-university students (grade 10) at a public technical institute in Akkar. These students are divided into two groups: an experimental group (25 students) and a control group (25 students). The participants study English as a foreign language and barely use it outside the classroom. Moreover, the students come from the same socio-economic status and share common characteristics.

Instruments

The pre- and posttests will be used to conduct the study, analyze the results, and discuss them to answer the research questions. All the participants in the control and experimental groups are given two proficiency tests, a pretest and a posttest. These tests gather information about students' use of critical reading skills before and after the experiment. These tests have been given to two experienced EFL teachers to validate them. After ensuring the content's validity by experienced teachers, the researcher uses a critical reading skills test (CRST) to measure EFL critical reading skills among grade ten students at the public technical institute.

CRST is used as a pretest and as a posttest. The students must read the passages and answer a few questions during one hour. The researcher grades the test, and the total mark is 30.

The test consists of two parts suitable for the student's level. In part one, students are asked to find a reading passage's leading and supporting ideas. In part two, they are asked to reread the second paragraph of the text and fill in a making inferences chart. In short, this test focuses mainly on scanning, skimming, and detecting clues to make inferences.

Procedures

Data Collection Procedure

The quantitative data are collected and analyzed using a pre-post-test for experimental and control groups. The experiment will be conducted with two grade 10 sections at a public technical institute. The students will receive some English texts during the experiment to improve their critical reading skills. The course focus will be on reading comprehension. The overall data collection procedure consists of the following: (1) administration of the pretest on November 1st, 2023, (2) 8 treatment weeks, and (3) a posttest on January 8th, 2024.

Data Analysis Procedure

After the data were collected from the sampled students' tests, the scores were analyzed descriptively and statistically to explore whether the experimental group improved compared to their peers in the control group. Descriptive statistics generate frequencies, percentages, means, and standard deviations for all research variables. The data collected by this research will be submitted to a t-test and the most recent version of the Statistical Package for the Social Sciences (SPSS) version. The t-test will be administered to test significant differences between the pretest and posttest means of the experimental and control groups. Results and their interpretations are presented in tabular form, referring to each part included in the pretest and the posttest. The issue discussed in the literature review, the importance of the MMS in students' CRS, is checked carefully in the tests' result analysis, and the data extracted from the tests are related to the research questions.

Validity of the Instruments

The tests are piloted to check the reliability of the designed instruments. Such a process is based on the notion of Kimberlin and Winterstein (2008), who highlight that the purpose of developing and validating an instrument is to reduce measurement error. Therefore, pretesting or pilot testing an instrument allows the researcher to identify such sources, whereas refinement of the instrument focuses on minimizing measurement error.

The pre-post-tests are piloted for the following purposes:

1. To check whether the time allotted is enough for students to answer all the questions,
2. To find out if any items are confusing or unclear, and
3. To ensure the instructions are clear enough for all students.

The diagnostic test is given to 15 Grade 10 students from the public technical institute where the study occurs. Those students are not a part of the actual study, so they will not influence the results. The first version of the diagnostic test included four questions that covered the two selected critical reading skills: scanning and skimming and making inferences.

Reliability of the Instruments

Internal Reliability

The Internal Reliability of the 2-item scale is assessed using Cronbach's Alpha technique. Cronbach's Alpha (Cronbach, 1951), also known as coefficient alpha, is a measure of reliability, specifically internal consistency reliability or item interrelatedness, of a scale or test. Cronbach's Alpha typically ranges from 0 to 1. A Cronbach's Alpha of 1 represents perfect consistency in measurement, while an alpha value of 0 represents no consistency in measurement. Table 1 shows that the 2-item scale produced a Cronbach's Alpha = 0.877, matching the range 0.8 - 1 labeled "Very Good" (Hejase & Hejase, 2013; Burns & Burns, 2008). According to Chehimi et al. (2019), this indicates an excellent strength of association and proves that the selection of the test dimensions is suitable for the test purpose.

Table 1: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.877	.877	2

Analysis of Variance

This study uses a one-way ANOVA to assess the pretest and posttest data to determine if they are homogenous and regularly distributed. The different skills tested were analyzed in the two groups using SPSS software with criteria of sig > 0.05. The one-way ANOVA test is performed to determine the impact of the treatment on the control and experimental groups.

Nonparametric Tests

In order to measure the improvement and test the statistical significance and validity of the results, a nonparametric test, namely a t-test, for paired samples is carried out. The aim is to test the following hypotheses:

Ho: The independent variables have the same distribution.

Ha: The independent variables do not have the same distribution.

In order to have statistically valid results, the expected null hypothesis must be rejected, or simply the measured probability (Sig 2- 2-tailed) needs to be less than the standard error of 0.05. In order to perform the t-test, the collected data are reorganized under SPSS, version 25. Moreover, cross-tabulation techniques are used to study the statistical significance and strength of the pair relationships used to perform the nonparametric tests and the regression analysis.

Research Findings

The study was carried out to investigate the Mind Mapping Strategy (MMS) and its efficacy in supporting grade 10 students' critical reading skills at a public technical institute in the north of Lebanon. The results showed a statistically significant difference between the experimental and control groups.

Table 2: The Results of the Pretest and Posttest

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest - Total of 100 (Control group)	58.3333	25	15.75069	2.87567
	Posttest - Total of 100 (Control group)	60.7778	25	12.08791	2.20694
		Mean	N	Std. Deviation	Std. Error Mean
Pair 2	Pretest - Total of 100 (Experimental group)	56.5185	25	12.79738	1.34896
	Posttest - Total of 100 (Experimental group)	82.8148	25	8.00922	.84425

Based on the table above, the mean score of the experimental group was 57 and 83 with a standard deviation of 12.8 and 8.009. Meanwhile, in the control group, the mean score was 58 and 61 with the standard deviation of 15.75 and 12.087.

Figure 2 shows the improvement graphically where the blue line depicts the pre-test grades, and the orange line shows the post-test grades. The post-test clearly illustrates that students of the experimental group had benefited from the training received in the two skills during the treatment sessions.

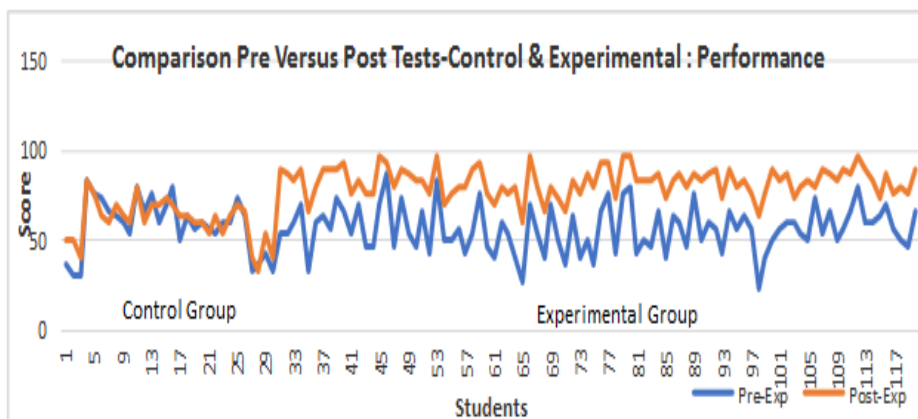


Figure 2: Comparison of Performance of the Control and Experimental Group: Pre Versus Post

Tables 3 and 4 show the outcomes of grade distribution for the pre and posttests. Table 3 shows that out of 25 students who did the pre-test, 12.20% have poor performance, 54.40% need improvement for their fair performance, 31.10% have good performance, and 2.20% have very good performance. On the other hand, Table 4 shows the results for the post-test after the students have been exposed to treatment sessions whereby, they have been trained to practice two skills using the Mind Mapping Strategy.

Table 3: Distribution of Pre-test Grades According to Students' Performance

Students' Group			Frequency	Percent	Valid Percent	Cumulative Percent
Control Group	Valid	Poor (21-40)	6	20.0	20.0	20.0
		Fair (41-60)	8	36.7	36.7	56.7
		Good (61-80)	10	40.0	40.0	96.7
		Very Good (81-100)	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
Experimental Group	Valid	Poor (21-40)	4	12.2	12.2	12.2
		Fair (41-60)	14	54.4	54.4	66.7
		Good (61-80)	8	31.1	31.1	97.8
		Very Good (81-100)	1	2.2	2.2	100.0
		Total	25	100.0	100.0	

Table 4: Distribution of Post-test Grades According to Performance

Students' Group			Frequency	Percent	Valid Percent	Cumulative Percent
Control Group	Valid	Poor (21-40)	4	13.3	13.3	13.3
		Fair (41-60)	8	33.3	33.3	46.7
		Good (61-80)	12	50.0	50.0	96.7
		Very Good (81-100)	1	3.3	3.3	100.0
		Total	30	100.0	100.0	
Experimental Group	Valid	Fair (41-60)	1	1.1	1.1	1.1
		Good (61-80)	10	42.2	42.2	43.3
		Very Good (81-100)	14	56.7	56.7	100.0
		Total	25	100.0	100.0	

Table 5 depicts the outcomes when pairing the post-test results with the pre-test results for the experimental group. The aim was to assess the impact of preparing students with the 'Mind Mapping Strategy' to improve their critical reading skills.

Table 5: Paired Samples Test

Students' Group			Paired Differences					t	df	Sig. (2-tailed)
			Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
						Lower	Upper			
Experimental Group	Pair 1	Pretest – scanning and skimming of 100 (Rater 1) - Posttest – scanning and skimming of 100 (Rater 1)	-21.11111	12.12708	1.27831	-23.65108	-18.57114	-16.515	89	.000
	Pair 2	Pretest – making inferences of 100 (Rater 1) - Posttest – making inferences of 100 (Rater 1)	-32.55556	15.25522	1.60804	-35.75070	-29.36041	-20.245	89	.000
	Pair 3	Pretest - Total of 100 (Rater 1) - Posttest - Total of 100 (Rater 1)	-26.29630	8.41265	.88677	-28.05829	-24.53430	-29.654	89	.000

Discussion

This experimental study aimed to evaluate the efficacy of the Mind Mapping Strategy (MMS) in enhancing critical reading proficiency among grade 10 students in Akkar, Lebanon. The researcher administered pre-and post-assessments to a control group receiving conventional English instruction and an experimental group trained in the MMS strategy. Quantitative analysis revealed that the experimental group exhibited statistically significant pre-post test score gains after MMS training, while the control group showed slight improvement.

The descriptive statistics and Table 2 show that students scored much higher on average in the post-test, reflecting that they improved their skills quite well (pretest mean = 56.51 versus post-test mean =82.81). Tables 3 and 4 significantly reveal the details on students' improvement when comparing numbers between pre- and post-test grades. It can be claimed that only 1.10 % need improvement for their fair performance, 42.20% had good performance, and 56.70% had excellent performance. The outcome demonstrates that the "Mind Mapping Strategy" motivates students to score higher grades. Therefore, the experimental group showed a decrease in poor performance; i.e., from 12.20% (pretest) to 0% (post-test); a decrease in fair performance; i.e., from 54.40% to 1.10%; a substantial increase in good and excellent performance; i.e., from 31.10% (good, pretest) and 2.20% (outstanding, pretest) to 42.20% (good, post-test) and 56.70% (very good, post-test). The results above are encouraging. A closer inspection of Table 5 shows that such pairing was statistically significant per se [Sig, values of .000 are less than the standard error of 1%]. Such a finding may be explained as follows: Comparing the pretest to the post-test provides realistic results for the same students under the same teaching environment – a fact that clearly shows the expected desired impact. In addition, the descriptive statistics of the previous section do show that students scored much higher, on average, in the post-test, reflecting that the students improved their skills quite well (pretest mean = 56.51 versus post-test mean =82.81).

This meticulously conducted study provides compelling evidence that the Mind Mapping Strategy (MMS) can significantly enhance the critical reading skills of grade 10 students. The data analysis reveals substantial improvements in critical reading proficiency, which can be attributed to using the MMS approach. These results underscore the potential of MMS as a powerful instructional strategy for fostering essential analysis and comprehension abilities.

This finding supports previous research by Alomari (2019), who found that electronic mind mapping developed students' comprehension skills because it helped students focus on the basic idea and sub-ideas of the text, use their own experiences, and come up with their ideas. The significant improvement in scanning, skimming, and making inferences also aligns with Ellozy and Mostafa's (2010) study results, which revealed that E-mapping effectively enhances critical thinking and helps students acquire visual skills. Furthermore, the study's results agreed with the results of Qasrawi (2015), who found that students' ability to infer the meaning of unknown words had improved.

In light of the present study, specific pedagogical implications can be proposed.

The Mind Mapping Strategy should be integrated into English language classes to cultivate critical reading skills among grade 10 students. This study provides robust evidence of its efficacy, offering educators a practical and effective tool for their teaching arsenal.

- Teachers should be trained to properly implement the Mind Mapping strategy in the classroom to maximize the benefits of improving students' critical reading skills.

Schools should give teachers time and resources to create appropriate Mind Maps and activities to support critical reading development. Preparation is vital to successful implementation.

Conclusion

In the context of the existing literature, this study aimed to examine the impact of the Mind Mapping Strategy (MMS) on developing critical reading skills among grade 10 students in Akkar, Lebanon. The study collected quantitative data from pre and post-tests. The results, in line with previous research, showed that the MMS was an effective teaching method that significantly improved the critical reading skills of the experimental group, who received MMS training, compared to the control group, who received conventional English instruction. The experimental group demonstrated substantial gains in scanning, skimming, and making inferences. The study, therefore, provided substantial evidence to support using the MMS as a pedagogical tool for enhancing critical reading proficiency among grade 10 students and contributed to the existing literature on the MMS and its applications in different contexts and domains.

This study's findings have practical implications for educators and curriculum designers. It demonstrates that if the mind mapping strategy is integrated correctly, it can be an appropriate technique to develop secondary students' critical reading skills, especially since it makes learning more engaging. Mainly, as more effective collaboration is built between teachers, students can increase their productivity and creativity in class activities. Hence, after examining the results of the study, it was concluded that students felt comfortable using the mind mapping strategy due to the ease of using it, and they were able to break down complex relationships, organize their thinking, take better notes, and improve comprehension and critical thinking.

It is important to note that integrating MMS to improve student's critical reading skills in only a few weeks does not yield immediate results. However, if such practices are sustained long, they will result in desirable reading outcomes. From this small-scale experimental study, the researcher concludes that teachers can help students demonstrate better critical reading abilities through a visual technique. The researcher is convinced that integrated efforts by teachers, students, and curriculum designers are required to prepare critical readers for our fast-changing world.

Funding: There is no funding source for this study.

Competing Interests: There is no conflict of interest.

References

- Alomari, A. (2019). Using mind mapping technique to improve reading comprehension ability of fourth grade Arabic language students in Jordan. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 24(1), 53-58. doi: 10.9790/0837-2401015358
- Birbili, M. (2006). Mapping knowledge: concept maps in early childhood education. *Early Childhood Research & Practice*, 8(2), n2.
- Blanchard, K & Root, C. (2005). *Ready to read now*. Pearson Education, Inc.
- Block, C. & Israel, S. (2005). *Reading first and beyond: The complete guide for teachers and literacy coaches*. Thousand Oaks, CA: Corwin Press.
- Buzan, B. (1993). *The mind map book: How to use radiant thinking to maximize your brain's untapped potential*. Dutton: Published by Penguin Group.
- Chehimi, G. M., Hejase, A. J., & Hejase, N. H. (2019). An assessment of Lebanese companies' motivators to adopt CSR strategies. *Open Journal of Business and Management*, 7(4), 1891-1925.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297-334
- Duncan, L. G., Colé, P., & Blaye, A. (2014). Cognitive flexibility predicts early reading skills. *Frontiers in Psychology*, 5, 565.
- Ellozy, A. R., & Mostafa, H. M. (2010). Making learning visible: Using e-maps to enhance critical reading skills. *MERLOT Journal of Online Learning and Teaching*, 6(3), 634-646.
- Hall, C & Barnes, M. A. (2017). Inference instruction to support reading comprehension for elementary students with learning disabilities. *Reading and Writing Quarterly*, 52(5), 279-286
- Harmer, J. (2007). *How to teach English*. Pearson Education.
- Hejase, A. J., & Hejase, H. J. (2013). *Research methods: a practical approach for business students* (2nd Ed.). Philadelphia, PA, USA: Masadir Inc.
- Hudson, R. F. (2007). Reading fluency: Critical issues for struggling readers. In S. J. Samuels & A. E. Farstrup (Eds.), *What Research Has to Say About Fluency Instruction*, (pp. 130-158). International Reading Association.
- Khodary, M. M. & Abdallah, M. M. (2014). Using a WebQuest model to develop critical reading achievement among languages and translation department students at Arar College of Education and Arts. *International Interdisciplinary Journal of Education*, 3(1): 246-256. Doi: 10.12816/0007416
- Kimberlin, C. L., & Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health-System Pharmacy*, 65(23), 2276-2284.
- Malekzadeh, B., & Bayat, A. (2015). The effect of mind mapping strategy on comprehending implicit information in EFL reading texts. *International Journal of Educational Investigations*, 2(3), 81-90.
- McGriff, S. J. (2007). *The effect of an analytic trait, task-specific rubric on self-efficacy and academic achievement* [Unpublished doctoral dissertation]. The Pennsylvania State University, College of Education, University Park, Pennsylvania.

- Mikulecky, B.S & Jeffries, L. (2005). *Reading power: Reading for pleasure, comprehension skills, thinking skills, reading faster*. New York: Pearson Longman
- Peng, S. (2011). *The effect of combining mind map and electronic picture-books on fourth-graders' reading comprehension ability and reading motivation* [Unpublished doctoral dissertation]. National Pingtung University of Education, Taiwan.
- Qasrawi, R. (2015). *The effectiveness of using context clues in teaching English vocabulary to English as a Foreign Language learners* [Unpublished MA Thesis]. Birzeit University, Ramallah, Palestine.
- Rosenshein, B.V. (1980). Skills hierarchies in reading comprehension. In R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension: Perspectives from cognitive psychology, linguistics, artificial intelligence, and education*. (pp. 73-96). Lawrence Erlbaum Associates.
- Teele, S. (2004). *Overcoming barricades to reading a multiple intelligences approach*. Thousand Oaks, CA: Corwin Press.
- Yunus, M. M., Salehi, H., & John, S. A. (2013). Using visual aids as a motivational tool in enhancing students' interest in reading literacy text. *Recent Advances in Educational Technologies*, 114-17. Retrieved from <http://arxiv.org/ftp/arxiv/papers/1305/1305.6360.pdf>
- Zin, Z. M., Eng, B. E. & Rafik-Galea, S. (2014). Critical reading ability and its relation to L2 proficiency of Malaysian ESL learners. *The Southeast Asian Journal of English Language Studies*, 20(2): 43-54.
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Appendix A Pre-posttest

Born and Raised in Greece

Have you ever heard the phrase "government by the people?" That is the meaning of the word *democracy*. The United States is a democratic republic, as are many countries around the world. But where did democracy come from? Some of the earliest ideas about democracy arose in the city of Athens in ancient Greece. But how should democracy be put into practice? The answer to that question has been strongly debated for centuries. Even when democracy was a new idea, people argued about how it should work. How should power be shared? Should all people be allowed to vote and make important decisions? Among the first people to think about these key issues were the ancient Greek philosophers.

Great Minds

The word *philosopher* means "lover of wisdom," a person who seeks knowledge and is able to make good and fair decisions. One of the best-known Greek philosophers, Socrates, lived nearly 2,500 years ago. He valued wisdom highly, and he thought deeply about democracy. Socrates was one of the principal critics of government run by the people. He felt that only fair and wise individuals should be allowed to decide things. The ideas that Socrates had about democracy were considered dangerous to the existing democracy in Athens. The Athenian leaders did not want some other "fair and wise", people aspiring to run their city. Socrates was a famous teacher. And speculation among the city's leaders included worries that he would encourage young students to pick up his radical ideas, so they chose to execute him.

Students of Philosophy

The philosopher Plato had studied with Socrates. He also thought seriously about democracy. In 380 B.C., Plato shared his ideas about government in his book *The Republic*. He agreed with Socrates that rule by the people would bring about poor decisions and a weak government. But, unlike his teacher, he believed that three different groups of people could share the responsibility of governing. The "highest" group would be philosopher-kings guided only by what is best for the state. The second group would be soldiers who protected the state. The last group would be common people who provided goods and services. Around 388 B.C., Plato formed a school called the Academy. A star pupil there was the philosopher Aristotle, who believed in balance and moderation. About 350 B.C., Aristotle wrote in his book *Politics* that a government that tried to restrict power to a few educated men would not work. It would benefit only the rich. A democracy run by common people would not work either, because such people might not make wise decisions. Aristotle's solution was combining the two. This would give people from all parts of society a voice.

Today people are still debating what the meaning of *Democracy* is and how governments should be organized.

Read the text carefully. Then answer the questions:

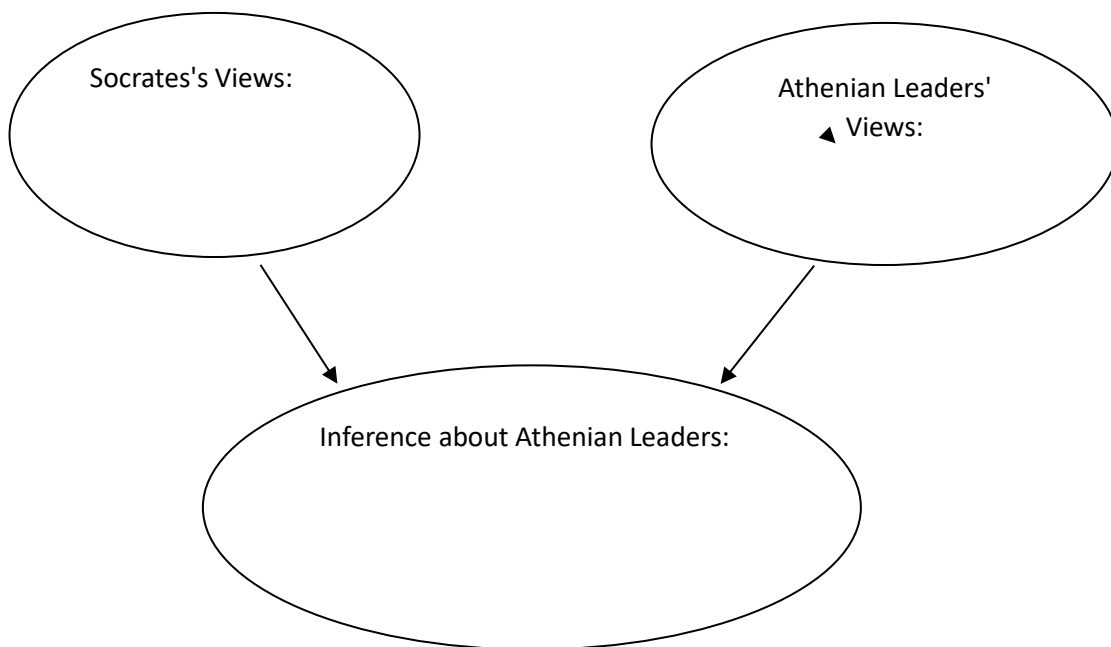
1- a- How do the headings help you understand the main idea of the text?

Heading 1: ----- 	Heading 2: ----- 	Heading 3: ----- -
Main idea of the text:		

b- Fill in the chart

Text evidence	Summary of the different ideas Greek philosophers have had about Democracy
Paragraph 1:	
Paragraph 2:	
Paragraph 3:	

2- Reread paragraph 2. Find out Socrates's views and the Athenian leaders' views. What can you infer about Athenian leaders?

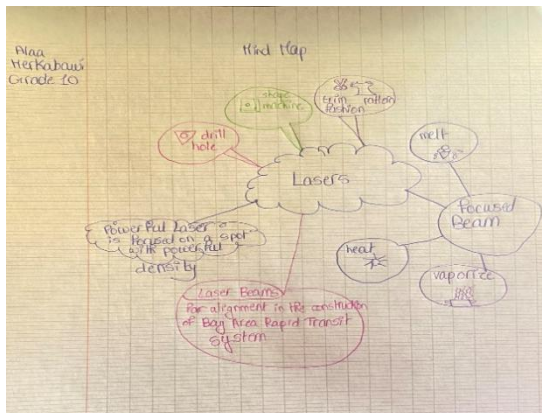


Appendix B Mind Mapping Template

Scanning and skimming a passage to find the main and supporting details

Draw a mind map including the main idea and supporting details after scanning and skimming the following passage.

The use of lasers is restricted only by imagination. Lasers have become valuable tools in industry, scientific research, communication, medicine, the military, and the arts. Powerful laser beams can be focused on a small spot with enormous power density. Consequently, the focused beams can readily heat, melt, or vaporize material in a precise manner. Lasers have been used, for example, to drill holes in diamonds, to shape machine tools, to trim microelectronics, to heat-treat semiconductor chips, to cut fashion patterns, to synthesize new material, and to attempt to induce controlled nuclear fusion. The powerful short laser pulse also makes possible high-speed photography with an exposure time of several trillionths of a second. Highly directional laser beams were also used for alignment in the construction of the Bay Area Rapid Transit system in San Francisco.



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