



วารสาร นาคบุตรปริทรรศน์

มหาวิทยาลัยราชภัฏนครศรีธรรมราช

NARKBHUTPARITAT JOURNAL

Nakhon Si Thammarat Rajabhat University

ปีที่ 15 ฉบับที่ 1 มกราคม - เมษายน 2566 Vol. 15 No. 1 January - April 2023

Received: November 7, 2022

Revised: December 10, 2022

Accepted: April 12, 2023

Using Electronic Mind Mapping to Enhance EFL High School Students' Critical Reading Skills

Sup Monliang*

Sakulrat Worathumrong

Supaporn Yimwilai

Faculty of Humanities, Srinakharinwirot University, Bangkok

*ผู้ประสานงานหลัก (Corresponding Author) E-mail: sup.monliang@g.swu.ac.th

Abstract

The objectives of this study were to: 1) examine the effects of electronic mind mapping on critical reading skills of EFL high school students; and 2) investigate EFL high school students' opinions about learning critical reading through electronic mind mapping. The participants in this study were 83 eleventh-grade students selected by purposive sampling. The instruments employed in this study consisted of lesson plans, a critical reading test, and a questionnaire. The data were analyzed using mean scores, standard deviation, and a *t*-test analysis. The results showed the effectiveness of electronic mind mapping. That is, the students improved critical reading skills after learning through electronic mind mapping. Also, the students had positive opinions about learning critical reading skills through electronic mind mapping.

Keywords: electronic mind mapping; mind mapping; critical reading skills; high school student

Introduction

In the 21st century where the information is easy to access, critical reading is a crucial skill for students. Hudson (2008) states students who have critical reading skills will be successful in schools. Students who have developed critical reading skills not only are able to analyze any text but also help them to score better in any exams. Varaporn and Sitthitikul (2019) also state that students need to be aware of the acquired information and should have suspicious minds while they approach any information sources. Therefore, students need to acquire critical reading skills and prepare for more challenging reading tasks. For Thailand, critical reading has also been emphasized as seen in the Basic Education Core Curriculum since B.E. 2551 or A.D. 2008 as one of the learners' key competencies, thinking capacity (Ministry of Education, 2008).

However, many Thai students have experienced the difficulties in learning to read, especially reading critically. This can be seen from the results of various assessments of English and reading. In 2018, the Organization for Economic Co-operation and Development or OECD published the results of the Programme for International Student Assessment 2018 or PISA 2018. The results revealed that Thailand was ranked 66th for reading out of 79 countries. Thai students scored 393 points in reading which 16 points lower than the assessment of PISA 2015 (Mala, 2019). In terms of critical reading, many research studies revealed similar results: most of the Thai EFL students could not read critically (Attaprechakul, 2013; Sawangsamutchai & Rattanavich, 2016). These studies reveal that Thai students have some difficulties in making inferences from the texts they read, cannot identify the tone and of the article as well as discover the attitudes of the writers, and cannot state the author's purpose.

There are two main factors related to the difficulties in learning English critical reading among Thai students. The first factor is the teaching method. Most schools in Thailand have used the traditional grammar-translation teaching approach in teaching reading (Sawangsamutchai & Rattanavich, 2016). Teachers take the role of being the translator of the text and providing the meaning and interpretation whereas students passively receive knowledge. This kind of teaching approach does not provide many opportunities for students to develop higher-order thinking and



critical reading. The second factor is interest and motivation. Pinter (2017) mentions that the key in learning other languages is motivation. However, in formal foreign language learning contexts, the main source of motivation for students is generally their teacher and the enjoyable activities they experience in the English classes. Pinter (2017) also suggests that to involve students' learning, activities can help them think as they read. Hence, it is important to find an effective way to teach reading.

Many scholars suggest mind mapping as an effective way to teach reading. According to Buzan (2004), mind mapping is the thinking tool that has been used for centuries for the purpose of learning, brainstorming, memorizing, thinking, visualizing and problem solving. Kaufman (2021) also expresses that mind mapping is a useful technique to use while reading. Because of the non-linear format. It helps viewing the whole note immediately and easily putting information in an appropriate branch or making connections between ideas. There are several educators investigating the use of mind mapping in class. For example, Malekzadeh and Bayat (2015) investigated the effects of mind mapping on understanding and comprehending the ideas in English texts. The study was conducted on students at an Iranian university. The findings revealed that mind mapping was effective in improving students' English reading comprehension. Saori (2020) also studied the effects of using mind mapping on students' reading comprehension. Mind mapping was employed in the experimental group whereas conventional learning was used in the control group. The result revealed that mind mapping was an effective technique to teach reading comprehension. However, Murray and Rabiner (2014) stated that technology has become a significant phenomena in daily human life since the beginning of the 21st century. The use of technology has become one of the most effective teaching and learning tools in the classrooms. Because the traditional form of mind mapping is created by hand, map size is also limited. Nowadays mind mapping has been combined with technology and electronic mind mapping has started to appear.

Electronic mind mapping can be an effective tool for teaching reading. Many scholars conducted research studies and found that electronic mind mapping not only affects students' reading comprehension but also provides positive attitudes among students such as the studies of Mohaidat (2018) and Sabbah (2015). Furthermore, electronic mind mapping is a potentially powerful active learning tool which helps enhance critical reading and develop strong reading skills (Ellozy & Mostafa, 2010). However, the traditional reading instruction makes Thai students lack motivation in learning critical reading. This reason holds students in learning critical reading. In addition, studies about using electronic mind mapping to improve critical reading skills are still limited. Integrating electronic mind mapping in reading class might be an effective method that can enhance students' critical reading skills. Therefore, this study was to investigate the effects of electronic mind mapping on EFL students' critical reading skills and opinions.



Research Objectives

1. To examine the effects of electronic mind mapping on critical reading skills of EFL high school students.
2. To investigate EFL high school students' opinions about learning critical reading through electronic mind mapping.

Research Methodology

Population and participants of the Study

The population of this study was 477 eleventh-grade students in the 2021 academic year at a demonstration school, Bangkok, Thailand. The reason to choose this demonstration school was due to the school's vision and student identity. The vision of the school emphasizes students' English language proficiency and the importance of reading critically. Additionally, the school states that students should have expertise in technology. The participants in this study were 83 eleventh-grade students studying in the second semester of the 2021 academic year at a demonstration school, in Bangkok, Thailand. They were selected by purposive sampling. Particularly, the participants had passed the English Reading I, the secondary school English course in the first semester of the 2021 academic year, and they enrolled in English Reading II course in the second semester. The main objective of this course is to develop students' critical reading skills. They were taught using the electronic mind mapping which is Coggle, the web-based mind mapping software. Moreover, the reason to choose these participants was to prepare students for being critical readers. This study was beneficial to the students because the students were learners of English as a Foreign Language (EFL). Therefore, they were appropriate to be the participants in this study.

Research Instruments

The instruments in this study included lesson plans, a critical reading test and a questionnaire. The details are described as follows:

1) Lesson Plans

Four lesson plans were designed by the researcher. Each lesson plan was to develop one sub-skill of critical reading skills. There are four lesson plans, namely "Making Inferences," "Recognizing the Author's Purpose," "Recognizing the Author's Tone," and "Drawing Conclusion." Electronic mind mapping was applied in each lesson plan. Each lesson plan covered two periods, with 45 minutes in each period.

In designing the lesson plans, the teaching method was adapted from a framework of teaching reading based on Grabe and Stoller (2019) and teaching processes of electronic mind mapping of Siriphanich and Laohawiryanon (2010), Wang (2016), Aljaser (2017), and Phongploenpis and Supangyut (2018). That is, the teaching method was divided into three stages: pre-reading stage, while-reading stage, and post-reading stage, and electronic mind mapping was integrated into each stage. In the pre-reading stage, electronic mind mapping was employed in order to activate the students' background knowledge and prepare students for reading texts as well as motivate students to read. In the while-reading stage, the teacher introduced one critical reading

skill to students. Students were asked to read the assigned text and practice the critical reading skill to check their understanding. Electronic mind mapping was employed in reading activities and exercises in order to help students organize the elements of reading and better understand the texts. In the post-reading stage, electronic mind mapping was applied to review the information that students acquired from the text. In addition, students also extended their understanding by commenting and evaluating what they read.

2) A Critical Reading Test

To measure students' critical reading skills, a critical reading test was developed for pre-test and post-test. The critical reading skills included making inferences, recognizing the author's purpose, recognizing the author's tone, and drawing conclusions. The test consisted of 20 multiple-choice items.

3) A Questionnaire

The questionnaire was employed to study the students' opinions about learning critical reading through electronic mind mapping. The questionnaire consisted of 10 five-point Likert scale items.

Data Collection

This study lasted six weeks. In the first week, the students were asked to complete the pre-test. The implementation lasted four weeks. After that, students were asked to take the post-test in order to answer the first research question. After that, the students were asked to complete a five-point Likert scale questionnaire.

Data Analysis

To answer the first question, the data from the pre-test and the post-test were analyzed by using means, standard deviation, and the *t*-test analysis. To answer the second question, the data from the questionnaire were analyzed using mean scores and standard deviations to find out students' opinions in learning critical reading through electronic mind mapping. The data from the questionnaire were scored as illustrated in Table 1.

Table 1 The Rates of the Students' Opinion Questionnaire

Positive Statements		Negative Statements	
Students' Opinion	Score	Students' Opinion	Score
Strongly Agree	5	Strongly Agree	1
Agree	4	Agree	2
Neutral	3	Neutral	3
Disagree	2	Disagree	4
Strongly Disagree	1	Strongly Disagree	5

The value of the students' opinions in learning critical reading through electronic mind mapping was interpreted by using the criteria in table 2.



Table 2 The Value of Students' Opinions toward Electronic Mind Mapping

Value	Mean Scores
Very positive	4.00 – 4.99
Positive	3.00 – 3.99
Neutral	2.00 – 2.99
Negative	1.00 – 1.99
Very negative	0 – 0.99

Research Findings

The first research objective was to examine the effects of electronic mind mapping on critical reading skills of EFL high school students. The result is shown in Table 3.

Table 3 The Comparison of the Pre-test Mean Score to Post-test Mean Score

Time	N	Mean	Max	Min	S.D.	t-value	Df	p-value
Pre-test	83	10.00	17	2	3.55	12.352	82	.000*
Post-test	83	13.42	18	2	3.39		82	

* $p < .05$

As shown in Table 3, there were statistically significant differences in the pre-test and post-test mean score of EFL high school students' critical reading skills ($t(82) = 12.352$, $p < .05$). The mean score of the pre-test was 10.00 ($S.D. = 3.55$) whereas the mean score of the post-test was 13.42 ($S.D. = 3.39$). The post-test score was significantly higher than the pre-test score at a level of .05. Therefore, the result indicates that EFL high school students developed critical reading skills.

The second research objective is to investigate EFL high school students' opinions about learning critical reading through electronic mind mapping. The result is shown in Table 4.

Table 4 Students' Opinions about Using Electronic Mind Mapping to Enhance Critical Reading Skills

Questionnaire Item	Mean	S.D.	The Value of Students' Opinion
1. Activities in class allowed me to practice critical reading skills.	4.35	0.65	Very positive
2. Activities in class were not useful for improving my critical reading skills.*	3.39	1.22	Positive
3. I participated and engaged myself more in learning critical reading skills through electronic mind mapping.	4.13	0.76	Very positive
4. Activities in critical reading class were too difficult.*	3.40	0.97	Positive
5. Learning critical reading skills through electronic mind mapping wastes my time.*	3.71	1.07	Positive



Questionnaire Item	Mean	S.D.	The Value of Students' Opinion
6. Activities in critical reading class encouraged me to have more confidence in learning critical reading skills.	4.07	0.71	Very positive
7. I want to study English subject because I like activities in class.	4.14	0.91	Very positive
8. Activities in critical reading class were boring.*	3.52	0.92	Positive
9. I do not think electronic mind mapping is effective in improving critical reading skills.*	3.52	1.03	Positive
10. I could apply activities I learned in critical reading class to my daily life.	4.23	0.83	Very positive
Total	3.85	0.91	Positive

* Negative Statements

Regarding the students' opinions about using electronic mind mapping to enhance critical reading, the average mean score is 3.85 (*S.D.* = 0.91), which meant that students had positive opinions about learning critical reading skills through electronic mind mapping. The statement receiving the highest mean score was "Activities in class allowed me to practice critical reading skills." (4.35), followed by the statement "I could apply activities I learned in critical reading class to my daily life." (4.23). The next two following statements were "I want to study English because I like activities in class." (4.14) and "I participated and engaged myself more in learning critical reading skills through electronic mind mapping." (4.13). The statement receiving the lowest mean score was "Activities in critical reading class were too difficult." (3.40). In spite of receiving the lowest score, the statement was at a positive level.

Discussion

Based on the first research objective, it was found that EFL students enhanced their critical reading skills by learning through electronic mind mapping. Electronic mind mapping was effective to teach critical reading skills for several reasons. First of all, electronic mind mapping helped students organize information and ideas of the reading texts. For example, when the students studied the drawing conclusion sub-skill, the teacher asked students to read the passage about helping the blind see. In this activity, students had to take notes in the electronic mind map. In addition, they had to use their information written in the electronic mind map to support their conclusion. The electronic mind mapping helped students organize the ideas and also remember the information from the reading text better. This discussion is similar to the studies of Chaichompoo (2017) and Mohaidat (2018) which found that electronic mind mapping had a positive effect on students' understanding and analyzing the reading texts. The information and the ideas were better arranged and organized when students used electronic mind mapping.



Second, electronic mind mapping promotes collaboration among students. In class, electronic mind mapping allowed students to see the whole mind map of the class which students could read their friends' ideas which led them to better understand. In addition, students had opportunities to brainstorm ideas with their classmates. One example was the teaching of making inferences in which the teacher designed the task for students to brainstorm ideas in their groups. The teacher provided the information from the reading text. Then students working in groups made inferences from the information and wrote their inferences using an electronic mind map by adding branches. Students had the opportunity to exchange and share the ideas with their members before completing the electronic mind map. This is in line with the study of Ellozy and Mostafa (2010) which revealed that electronic mind mapping promoted students to have more opportunity to express and exchange their ideas in groups. They learned from their members and increased their understanding.

Regarding the students' opinions about using electronic mind mapping to enhance critical reading skills, it was found that the students expressed positive opinions because electronic mind mapping promotes students' enjoyment. Compared with traditional mind mapping, electronic mind mapping is more attractive to students. Creating mind mapping on paper consumes too much time and effort. Moreover, the size of the sheet and the tools are limited. However, when learning through electronic mind mapping, students had an opportunity to use various tools provided by the electronic mind mapping software in order to add branches in mind mapping real time. Students also enjoyed attaching some pictures into the mind map which were related to the topic of the reading text. The statement from the questionnaire, "I want to study English because I like activities in class," showed that students enjoyed activities in class, which motivated them to study critical reading skills through electronic mind mapping. This discussion is in line with the study of Sabbah (2015) which investigated the effects of electronic mind mapping on students' reading comprehension and the results showed that students had positive attitudes toward the electronic mind mapping.

Recommendations

The results of the study found that EFL high school students can develop their critical reading skills after learning through electronic mind mapping. Therefore, it might be useful for English teachers to consider electronic mind mapping as an alternative tool to design the activities in reading lessons.

Although the present study revealed the positive effects of electronic mind mapping on EFL high school students, further research can be conducted to strengthen the knowledge in the field. First, this study was only conducted on students at the secondary school level. It would be more interesting to conduct research on students at different levels. Moreover, this study was limited to only four sub-skills of critical reading skills including making Inferences, recognizing the author's purpose, recognizing the author's tone, and drawing conclusions. Further research could employ electronic mind mapping to develop other critical reading sub-skills.



References

- Aljaser, A. M. (2017). The effectiveness of electronic mind maps in developing academic achievement and the attitude towards Learning English among primary school students. *International Education Studies*, 10(12), 80-95.
- Attaprechakul, D. (2013). Inference strategies to improve reading comprehension of challenging texts. *English Language Teaching*, 6(3), 82-91.
- Buzan, T. (2004). *Mind maps for kids: Study skills*. London: Harper Thorsons.
- Chaichompoo, C. (2017). Using e-Mapping to improve reading comprehension and summary skills of EFL students. *NIDA Journal of Language and Communication*, 22(30), 129-138.
- 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.
- Grabe, W. P., & Stoller, F. L. (2019). *Teaching and researching: Reading* (3rd ed. ed.). New York: Routledge.
- Hudson, T. (2008). Teaching second language reading. *ELT Journal*, 63(1), 89-91.
doi:<https://doi.org/10.1093/elt/ccn061>
- Kaufman, J. (2021). Simple techniques to optimize your reading comprehension and retention. In The Personal MBA. Retrieved from <https://joshkaufman.net/3-simple-techniques-to-optimize-your-reading-comprehension-and-retention/>
- Mala, D. (2019). Poor grades for Thai students in PISA tests. Retrieved 2022, January 2, from <https://www.bangkokpost.com/thailand/general/1808509/poor-grades-for-thai-students-in-pisa-tests>
- 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.
- Ministry of Education. (2008). *Basic Education Core Curriculum B.E. 2551 (A.D. 2008)*. Bangkok: Kurusapa Ladprao.
- Mohaidat, M. M. T. (2018). The Impact of electronic mind maps on students' reading comprehension. *English Language Teaching*, 11(4), 32-42.
- Murray, D. W., & Rabiner, D. L. (2014). Teacher use of computer-assisted instruction for young inattentive students: Implications for implementation and teacher preparation. *Journal of Education and Training Studies*, 2(2), 58-66.
- Phongploenpis, S., & Supangyut, M. (2018). The effect of mind map technique on students' reading comprehension. *International Journal of Management and Applied Science*, 4(12), 49-53.
- Pinter, A. (2017). *Teaching young language learners*. Oxford: Oxford University.
- Sabbah, S. (2015). The effect of college students' self-generated computerized mind mapping on their reading achievement. *International Journal of Education and Development using ICT*, 11(3), 4-36.
- Saori, S. (2020). The use of mind mapping to teach reading comprehension. *Journal of Languages and Language Teaching*, 8(2), 162-169.



- Sawangsamutchai, Y., & Rattanavich, S. (2016). A comparison of seventh grade Thai students' reading comprehension and motivation to read English through applied instruction based on the Genre-based Approach and the teacher's manual. *English Language Teaching*, 9(4), 54-63.
- Siriphanich, P., & Laohawiriyanon, C. (2010). Using mind mapping technique to improve reading comprehension ability of Thai EFL university students. The 2nd International Conference on Humanities and Social Sciences, 1-13. Retrieved 2021, January 2, from Retrieved from <http://fs.libarts.psu.ac.th/research/conference/proceedings-2/4pdf/001.pdf>
- Varaporn, S., & Sitthitikul, P. (2019). Effects of multimodal tasks on students' critical reading ability and perceptions. *Reading in a Foreign Language*, 31(1), 81-108.
- Wang, Y. (2016). Application on mind map in college English reading teaching. Paper presented at the 2nd International Conference on Economics, Social Sciences, Arts, Education and Manage Engineering, Jinzhou, China.

Author

Mister Sup Monliang

Graduate Student, Master of Arts (English)
Faculty of Humanities, Srinakharinwirot University
114 Sukhumvit 23, Bangkok, 10110
E-mail: sup.monliang@g.swu.ac.th

Dr. Sakulrat Worathumrong

Thesis Advisor, Faculty of Humanities
Srinakharinwirot University
114 Sukhumvit 23, Bangkok, 10110
E-mail: sworathumrong@gmail.com

Assistant Professor Dr. Supaporn Yimwilai

Thesis Co-advisor, Faculty of Humanities
Srinakharinwirot University
114 Sukhumvit 23, Bangkok, 10110
E-mail: supapoy@g.swu.ac.th

