Effects of a research-based learning approach integrated with self-monitoring on enhancing the critical reading skills of upper secondary school students

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Abstract

This study examines the extent to which the critical reading skills of upper secondary school students are enhanced through a research-based learning approach integrated with self-monitoring program. Participants consisted of 16 upper secondary school students enrolled on an English reading course at a public Thai upper secondary school. A critical reading pre-and post-test and interviews were employed to gain information for data analysis. The results from both instruments showed insignificant difference in the students' critical reading ability. It was also found in the interview that the skills of making inference and forming judgments tended to be more challenging for students than investigating sources, identifying the author's purpose, and distinguishing facts from opinions.

Keywords: self-monitoring, critical reading skill, research-based learning

1. Introduction

Critical reading skills are crucial for students in the 21st century where information is easily accessed but often overloads the individual. Critical reading skills are composed of the abilities to analyze and make judgments on the nature and value of reading materials based on the standards obtained from the reader's experience (Spache & Spache, 1964). The skills comprise investigating sources, recognizing the writer's purpose, distinguishing opinion from fact, making inferences, and forming judgments. The definition of critical reading skills was defined by Spache and Spache (1964) who emphasized the skills of investigating sources which involves the searching for, evaluation and collation of facts, opinions, and viewpoints from several sources. This critical reading skill is needed for research activities. Moreover, this definition was aimed at covering less experienced readers as young as primary school students. Critical reading skills help readers objectively evaluate various materials based on well-supported judgments. Besides reading textbooks, high school students read from other second-hand sources where the author's viewpoint is hard to determine, the author's purposes are often hidden, some facts/opinions are unreliable, inference making is misguided, and the result is ineffective judgments on texts. Due to

rapid technological advances, the world has now become a knowledge-based society. The large amount of information creates problems for readers, especially young students with less experience in terms of the critical analysis and evaluation of information and its sources. The reliability, accuracy, and hidden purposes of messages are hard to distinguish for inexperienced readers. For the few experienced readers, opinions with unverified facts are questionable in terms of their reliability. Consequently, young readers, such as high school students, need to be trained to acquire critical reading skills.

At school, students are expected to read for meaning. English critical reading is very limited because English subjects in the secondary school curriculum mainly aim at building the foundation skills in English. However, junior and senior high school students are expected to read and think critically, to analyze and to evaluate information, and yet they are hardly taught how to do so in the classroom (Acott, 1985).

According to previous studies, many findings have shown that Thai students lack critical reading skills. For example, Attaprechakul (2013) mentioned that Thai students were less able to infer the primary argument from English reading texts. A study by Katib (1997) {Nitsaisook, 2003 #73} investigated the EFL reading performance of

four groups of Thai secondary and tertiary students and indicated that all groups performed poorly on making inferences. Students need to be prepared for more challenging English reading tasks in higher education in which they need higher order thinking skills, namely, analysis and evaluation.

In reading instruction, many studies have reported that reading strategies should be a focus when designing intensive reading instruction. For example, a study of summary writing as a critical reading strategy confirmed the need for teaching strategies in a reading course to enhance critical reading comprehension (Shokrpour, Sadeghi, & Seddigh, 2013). Another study on the effect of teaching critical reading strategies also emphasized the improvement of EFL learners' vocabulary retention (Khabiri & Pakzad, 2012).

Brew (2006) identified the research-based learning approach (RBL) as being able to enhance the aforementioned critical reading skills as it is underpinned by the five theories of inquiry/research-based learning, learner-centredness, self-directed learning, authentic learning, and collaborative learning. Engaging students in reading with their own questions is at the core of research-based learning approaches that motivate and encourage students to effectively interact with reading texts (Wallace &Wray, 2011).

RBL involves active instruction in which students actively and collaboratively learn through research processes in order to develop their learning outcomes. The approach is expected to enhance critical reading skills because during research processes students experience a number of reading tasks and the evaluation of reading materials in order to complete their research projects (Kellett, 2005).

The RBL approach has both strengths and weaknesses. Conducting research projects is seen as a difficult task for students, and so it is recommended that the design of research projects should focus on practical issues and contexts. Skill development should be useful for students, which is to say that they should realize its importance. Moreover, course designers should find ways to motivate and build students' confidence to complete their research projects successfully (Jiang & Roberts, 2011). Students find themselves often overwhelmed by information while collecting data and reading for research projects (Brew, 2006).

Consequently, self-monitoring is integrated to reduce the negative effects of RBL. Self-monitoring refers to the observation and evaluation of one's own learning in terms of motivation, cognition and learning tasks. Self-monitoring is expected to help students be aware of and judge their reading tasks, comprehension, and motivation while reading for their research projects (Bandura, 1986). For this study, students' field notes were used as a self-monitoring technique for keeping a record of their learning performance. During learning, students used field notes as a self-monitoring tool to observe and evaluate their own learning. The field notes were designed to provide topics to be self-monitored and blank space for students' reflection on their cognition, motivation, and learning context. This record provided information about the effectiveness and results of a student's learning process. As a result, the self-monitoring was designed and integrated with RBL to enhance the critical reading skills of the students.

Despite the advantages of the research-based learning approach, its effects on students' critical reading were investigated as outlined further below. Furthermore, there has not been any research into enhancing the English critical reading skills of upper secondary students in Thailand; thus, the researcher proposes this research topic for study.

2. Objectives

This study investigated the effects of the research-based learning approach integrated with self-monitoring on the critical reading skills of upper secondary school students in Bangkok.

2.1 Research question

To what extent does a research-based learning approach integrated with self-monitoring affect the critical reading skills of upper secondary school students?

2.2 Hypothesis

The post-test mean scores of the upper secondary school students' critical reading skills are significantly higher than the pre-test mean scores at the 0.05 level after the intervention of the research-based learning approach integrated with self-monitoring.

3. Materials and Methods

3.1 Population and sample

The population in this study was upper secondary school students in Bangkok. This study was conducted in a classroom setting as an elective course. This research employed the one-group pretest-posttest design and the group of participants was assigned to the reading course by convenience sampling. The sample of this study comprised 16 students consisting of 4 males and 12 females from grade 10. All the participants were Science and Math majors. The population in this study comprised 214 upper secondary school students majoring in Science and Mathematics at Secondary School. All of them had passed the basic compulsory English courses set by the Ministry of Education and were deemed to be at a pre-intermediate level of English proficiency following convenience sampling. The sample group was selected from the population, who were enrolled in the Critical Reading English course in the first semester of academic year 2013. The purpose of this course was to develop the critical reading skills through the means of reading for student research in order to prepare for future higher education or careers.

3.2 The design of RBLSM learning materials

The RBLSM instruction comprised three unit lessons organized in topic units. A survey on the topics of interest was administered with 30 upper secondary school students in the second semester of the academic year 2011. The survey revealed that self-improvement was most selected by both male and female students. From informal interviews, students revealed that they wanted to be smarter, more diligent and successful. As a result, three topics, namely, 1) My Brilliant Brain, 2) Powerful Mind and Body, and 3) Being Successful were chosen as the unit titles. Moreover, there were two types of learning materials used in the classroom: 1) reading materials, and 2) video clips.

The reading materials used in class were extracted from books, magazines, and websites. The three reading texts were simplified and their readability calculated which resulted in an average grade level of 7-8. The readability was calculated from five readability formulas: Flesch-Kincaid Grade Level, Gunning-Fog Score, Coleman-Liau Index. SMOG Index, and Automated Readability Index (Alderson, 2000; Kincaid, Fishburne,

Rogers, & Chissom, 1975). The grade level numbers referred to the number of years of education basically required to comprehend the text. A reading level for high school should be around a score of 10-12. However, texts for general public use are recommended to have a grade level of around 8. Reading authentic materials, with a readability of around a grade level of 8 was the focus of this study.

Secondly, three video clips were extracted from a documentary movie, a science TV program, and a famous innovator's speech at Stanford University. The appropriateness and difficulty of the content was validated by three experts.

3.3 The development of a theoretical framework of the research-based learning approach integrated with *self-monitoring (RBLSM)*

The design of the framework used in this study integrated three theories: 1) the research-based learning approach, 2) self-monitoring, and 3) critical reading instruction.

3.3.1 Research-based learning approach

The research-based learning approach refers to active instruction in which students actively and collaboratively learn through research processes in order to develop their learning outcomes. The framework used in this study was based on Brew's model (2006) with the following assumptions: students construct their own knowledge collaboratively and equally through the research process in a scholarly community. The six basic concepts of research-based learning of scholarly communities, namely, inclusivity, research, teaching and learning, knowledge construction, and scholarship were integrated into the reading course.

3.3.2 Self-monitoring

Self-monitoring, in this study, refers to students' attempts to raise awareness of their learning process by observing and evaluating their actions, thoughts and motivation (Bandura, 1986). For this study, keeping field notes was the self-monitoring technique because the students acted as researchers. Field notes refers to the notes recorded by researchers during and after observing events in their research study. Normally, researchers decide which method of writing field notes works for them as it can be very personal and subjective. However, in this study, students were

learning to be researchers, and they lacked experience on what information should be noted in the journal; as a result, the teacher or course planner provided guidelines as to how to write field notes and what kind of information was required for their research project. The field notes were designed in a structured way to observe and evaluate students' actions, thoughts and motivations during each part of the research process. Consequently, the field notes consisted of four research stages: *Question, Plan, Figure it out,* and *Share your story.*

3.3.3 Critical reading instruction

Critical reading instruction is designed based on the three reading stages of *pre-reading, during-reading,* and *post-reading.* The selection of activities for each stage are considered based on the nature and goal of the reading course. The course was a research-based syllabus where students were required to search for and analyze information in order to complete their research projects. The course goal was to enhance the critical reading skills of the target students. The objectives of the course were assessed from the results from developing the following five target skills: investigating sources, recognizing an author's purpose, distinguishing opinion from fact, making inferences, and forming judgments (Spache & Spache, 1964). Consequently, the teaching reading strategies and practice of the reading skills were to be integrated in the instruction.

The four research stages used in this study were synthesized from the six underpinning concepts previously mentioned and the core elements of the research process in which critical reading skills are thoroughly involved. During the three weeks of a unit, students were divided in groups of four and engaged in the four research stages in which critical reading skills were practiced. The details of each stage are presented as follows.

Stage 1: Question

The aims of this stage were to activate students' interests in doing a research project and develop a culture of inquiry by thinking about what they read in a way that they will end up with a question after reading.

1.1 The teacher activated students' interests and background knowledge by showing a video clip of learning content in the course.

1.2 Vocabulary introduction was followed by discussion about the new vocabulary.

1.3 Students did the individual reading. Students were required to read an article on the related topic provided by the teacher.

1.4 The teacher led the class in a discussion on differences in terms of critical reading between the content from different sources, from the video clip and from the text, and at the same time, the teaching of critical reading strategies was put into practice. The five target strategies comprise distinguishing fact from opinion, recognizing viewpoints from several sources, recognizing the author's purpose, making inferences, and forming judgments.

1.5 Students were encouraged to think and formulate their research questions after their reading. It must be possible for the students to research and find answers to the research questions.This process is considered a way of developing critical reading skills through questioning the reading texts and content from the video clip. For example, from Unit 1 "My Brilliant Brain", the content from the video clip suggests that a brain cannot be developed after the age of 6. However, the reading passage used in class suggests the brain never stops growing and can be developed at any age. The information from both sources provides different ideas about brain development. The discussion led by the teacher stimulated students drawn on experience from their own lives and question the information from both sources. Finally, the students were able to formulate their own research questions, such as 'Can I become a genius at this age?', 'Can I increase my intelligence?', 'How to be smarter?'.

Stage 2: Plan

This stage aimed to provide students with the opportunities to produce an overall structure of reading ideas which kept them focused while searching for reading texts for their projects. At the same time, students self-monitored their learning process and practiced active learning by planning for their own research projects. Students were required to plan what to read and where to find reading materials from several sources. At this stage, critical reading strategies were taught for twenty minutes in order to help students interact with the texts they gathered effectively. Moreover, students learned to investigate sources in which genres and forms of texts were discussed based on the reliability and validity of their

content. This process also helped students choose texts which provided answers for their research questions by considering the validity of the content and level of language difficulty. As a result, expository and persuasive writing texts were emphasized in the study because they provide explanations of causes and effects, problems and solutions, and evidence for the critical reading practice. The text used in this study referred to any written texts that students chose out of their own interests in order to answer their research topics. Students were encouraged to search for texts from books, magazines, journals, and the internet.

Stage 3: Figure it out

This stage consisted of the two sub-processes of individual reading and group reading.

1.1 *Individual reading* aimed to engage students in gathering information on their own outside classroom. In doing so, students practiced investigating sources, distinguishing fact from opinion, making inferences, and forming judgments with their own level of understanding.

1.2 *Group reading* – occurring in the classroom – had two objectives: 1) to engage students in sharing their way of researching and making meaning from texts, and 2) to offer students opportunities in checking the reliability and validity of the content they gathered.

1.2.1) Each student reported to their group members what they found in their own words and in a summarized version.

1.2.2) Each student presented how they evaluated the reliability of content from their text based on the focused objectives of each unit, such as the investigation of viewpoints, author's purpose, fact/opinion, inferences, and drawing conclusions. Other group members made decisions on the reliability of each text.

1.2.3) Every group member made notes in a table in their field notes. The table provided them the opportunity to compare information from each text including the viewpoint of the author, fact/opinion, author's purpose, and inferences.

1.2.4) Each group made judgments about the texts as to how to combine all information in a way that can answer their research questions and be used for their research papers. Students concluded on the results in their field notes.

Stage 4: Share your story

This was the presentation stage. This aimed to train students in critically reading their research paper and deciding which content interested, benefited and engaged their audience, in this case, their peers. The purpose of the student's presentation was to maximize the audience's understanding on a topic. Student presenters had to prepare one main point and some supporting points, as well as some examples which benefited their peers as concerns comprehension. There were three processes for the presentation session in the classroom. This stage required students to write a research paper to present their understanding on a topic and to structure their thinking in academic writing. The research paper was considered a product of the research process and was not as focused upon as the process; however, it was a tool for the student to practice thinking in words in a professional manner. As a result, in this course students were required to write in the norms of academic writing in which students used their own words and citations. There were three procedures in this stage as follows:

1) Introduction was the first step in which the teacher reminded students of the objectives of the presentation session which, besides improving understanding of the topic, was to treat other opinions with respect and give each other constructive contributions by sharing opinions, feedback and comments toward the presentation.

2) During the presentation: Before the presentation started, the research paper had to be submitted to the teacher to assess the student's presentation of ideas through writing. Next, each group presented their work, while the audience informally evaluated their peers' presentations based on the reliability of the content and interest of the presentation on a rating scale and the comment spaces in their field notes

3) After the presentation, the students and teacher were required to ask questions as well as give comments and feedback to the presenters. Also, the teacher ended the lesson with a review of the content learned and provided feedback to the whole class.

During the three weeks of a unit, students' critical reading skills were expected to be repeatedly practiced through each research stage for the following reasons.

Through each research stage, students were engaged in reading and thinking all along the process. In the first stage of *Question*, students were required to read a topic and to watch a video clip whose content was designed to activate their curiosity on the topic. As a result, students easily formulated questions pertaining to their interest after the reading task. The questions were considered a product of critical reading in this course. Planning – in the *Plan* stage – for reading was so important for students to have a clearer picture of the reading tasks, where to find the relevant information for their research question as well as to learn the critical reading strategies which helped them respond to texts in a critical manner. In this course, a variety of sources was emphasized, so the planning stage reminded and guided students to search from different sources. This stage also provided students with the opportunity to self-monitor their learning process as this was identified as helping them direct their attention through the research project. The third stage, *Figure it out*, engaged students in critical reading the most as researching for information to answer the research question required students to exercise all critical reading skills by questioning what they are reading. For example: What is the text talking about? (to identify a viewpoint from the text); Who is the writer? Is he/she capable of writing about this topic appropriately? What is his/her purpose? (to identify and to evaluate the author's purpose); Are the opinions/facts supported by sound reasons and evidence? (to distinguish facts from opinions); What does the author infer? (to make inferences); What conclusions can I reach based on the facts provided? (to make judgments); and so on. As mentioned above, this stage required students both to read individually at their own pace outside the class and to read collaboratively in the class. The group reading provided students the opportunity to learn how their friends interpret reading texts and to respect group decisions on the evaluation of the content. By sharing ways to interpret texts and comparing the weaknesses and strengths in doing so, students could improve their critical reading skills effectively. The last stage, *Share your story*, was the presentation stage. It required students to review their reading texts again and combine the information in a way that could be understood by the audience. Students critically read their gathered information from at least four sources and deliberated on which content

was important for presentation and how the information should be organized in a way best understood by their peers. For this course, presenters were also required to present how they evaluated the reliability of the source in order to share ways of interpreting texts with other groups or scholarly communities in accordance with the work of Brew (2006). After the presentation, the audience and teacher gave comments and feedback in Thai on the content presented, so students would learn and respect what others thought of their work.

The framework for this study was designed based on the three theories mentioned above and is shown below.
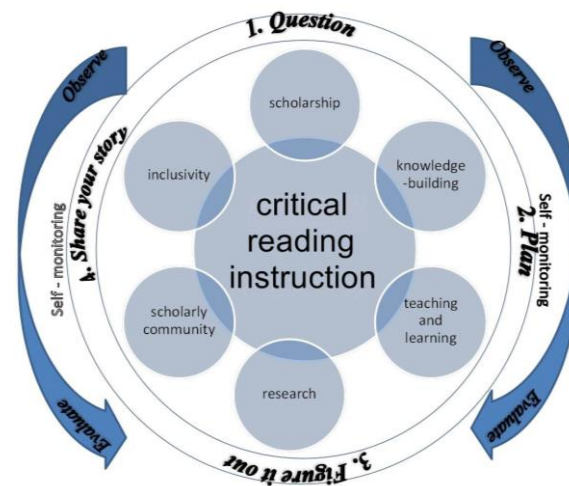
Figure 1 The framework of the research-based learning approach integrated with self-monitoring

3.4 Research instruments

According to the research objective, in order to investigate students' critical reading skills, an English critical reading test was used as pre-and post-tests.

3.4.1 Critical reading pre- and post-test

The critical reading pre- and post-tests were designed by the researcher. The critical reading test assessed students' critical reading ability before and after the treatment. The test comprised 33 questions which targeted five aspects of critical reading: investigating sources, recognizing the writer's purpose, distinguishing facts from opinions, making inferences, and making judgment about texts. The same test was

administered as the critical reading pre- and post-test. Because the number of the samples was less than 30 participants and one group of the sample comprised the experiment group,the mean scores and standard deviation obtained from the Wilcoxon matched-pairs signed rank test were used to identify the changes in students' critical reading abilities. The thirty three multiple choice test items were developed from six passages to measure the critical reading skills. Each test item consisted of four choices (a, b, c, or d). Reading passages were adapted from books, magazines, and websites. The content and construct validity of the test were assessed by three experts in English language instruction and assessment based on the Index of item-objective congruence (IOC). The overall content validity was 0.93. Pilot testing scores were calculated using the SPSS program for item analysis to identify the functionality of test (reliability), test item difficulty (difficulty index), and gap between high and low scorers (discrimination index). According to the reliability coefficient (Kuder-Richardson 20 formula or KR20), the overall test reliability, difficulty index, and discrimination index were 0.72, 0.39, and 0.33, respectively, which suggested that the test was reliable and valid.

4. Results

The findings from two research instruments were reported. The results from the critical reading pre-and post-test were analyzed in the following two ways: 1) analysis of the overall scores of the five skills, and 2) the analysis of each skill as detailed below.

4.1 Critical reading skills

4.1.1 Results from the comparison of critical reading pre- and post-tests (N=16)

The results from the pre-test and post-test scores of the critical reading tests indicate that after thirteen weeks of RBLSM, there was statistically insignificant improvement. The critical reading test, employed in this study, had a total score of 33. Based on Table 1, the mean score of the pre-test was 16.06 (S.D. = 4.851), with minimum and maximum scores of 10 and 25, respectively. The mean score of the post-test was 16.94 (S.D. = 5.756), with minimum and maximum scores of 9 and 25, respectively.

Table 1 presents the descriptive statistics of the overall critical reading test scores of all sixteen students. The table shows the minimum and maximum values of the test scores, mean scores, as well as standard deviations.

Table 1 Pre- and post-test results of critical reading test

	N	Minimum	Maximum	Mean scores	S.D.
Pre-test Score	16	10	25	16.06	4.851
Post-test Score	16	9	25	16.94	5.756

*p< 0.05

In order to clarify the effect of RBLSM on each skill of the participants' critical reading ability, the results based on a 33-item test were analyzed and illustrated in Table 1.

Table 2 shows the three ranks of students, namely the negative ranks, the positive ranks, and the ties. The three students in the negative ranks were students who received lower post-test scores than pre-test scores. The six students in the positive ranks were those who received higher post-test scores than pre-test scores. The seven students with equal scores were those with the same scores in both the pre-test and post-test scores. The table shows that the pre-test and post-test scores did not differ significantly at the 0.05 level (p < 0.05).

To conclude, the post-test scores for the critical reading skill test showed insignificant improvement from the pre-test scores. This leads to the conclusion that students' critical reading skills did not improve significantly after their participation in the RBLSM.

Table 2 Differences between the overall pre-test and post-test scores in the critical reading test

		N	Mean Rank	Sum of Ranks
Post-test Score – Pre-test Score	Negative Rank	3(a)	3.00	9.00
	Positive Rank	6(b)	6.00	36.00
	Tie	7(c)		
	Total	16		

a Post-test Score < Pre-test Score
b Post-test Score > Pre-test Score
c Post-test Score = Pre-test Score

Test Statistics(b)

	Post-test Score – Pre-test Score
Z	-1.630(a)
symp. Sig. (2-tailed)	.103

*p< 0.05
a Based on negative ranks
b Wilcoxon signed-ranks test

This additional analysis attempted to identify how much progress students had made in each critical reading skill. The Wilcoxon matched-pairs signed-rank test was used to compare the overall pre-test and post-test scores of the students.

Table 3 shows the descriptive statistics of the overall pre-test and post-test mean scores for each critical reading skill of the students. The table shows the minimum and maximum values of the test scores, the mean scores and the standard deviations.

Table 3: Pre- and post-test results of the five critical reading skills

		Minimum	Maximum	Mean	S.D.
1.Investigate Source					
1) Identifying the Viewpoint	Pre-test	1	6	3.25	1.483
(N = 16)	Post-test	1	6	3.56	1.590
2) Comparing Sources	Pre-test	0	2	1.31	.793
(N = 16)	Post-test	0	3	1.63	.885
2. Recognizing the Author's Purpose	Pre-test	1	5	2.81	1.167
(N = 16)	Post-test	0	5	2.50	1.317
3. Distinguishing Facts from Opinions	Pre-test	1	5	3.31	1.302
(N = 16)	Post-test	1	6	3.25	1.653
4. Making Inferences	Pre-test	0	6	2.50	1.461
(N = 16)	Post-test	1	5	2.81	1.223
5. Forming Judgments	Pre-test	1	6	2.88	1.258
(N = 16)	Post-test	1	6	3.19	1.515

As shown in Table 3, a non-significant difference was found for each skill in the pre- and post-tests. The results indicated that identifying viewpoint, the first sub-skill of investigating sources, increased non-significantly after the thirteen-week treatment (mean = 3.56, $t(15)$ = -1.57, p= 0.14). Comparing sources, the second sub-skill of investigating sources, also increased non-significantly (mean = 1.63, $t(15)$ = -1.57, p= 0.14). Recognizing the author's purpose improved non-significantly (mean = 2.50, $t(15)$ =1.05, p=

0.31). This was also true for distinguishing fact from opinion (mean = 3.25, $t(15)$ = 0.18, p= 0.85), as well as making inferences and forming judgments (mean = 2.81, $t(15)$ = -1.00, p= 0.33, and mean = 3.19, $t(15)$ = -0.92, p= 0.37, respectively).

The following table gives the results of the comparative analysis concerning the students' pre-test and post-test scores for each critical reading skill. The Wilcoxon matched-pairs signed-rank test was employed in the process of analysis.

Table 4 Differences between the overall pre-test and post-test scores in each critical reading skill of the students.

			N	Mean Rank	Sum of Ranks
Identifying the Viewpoint	Post - Pre	Negative Rank	2(a)	4.00	8.00
		Positive Rank	6(b)	4.67	28.00
		Tie	8(c)		
		Total	16		
Comparing Sources	Post - Pre	Negative Rank	2(a)	4.00	8.00
		Positive Rank	6(b)	4.67	28.00
		Tie	8(c)		
		Total	16		
Recognizing the Author's purpose	Post - Pre	Negative Rank	7(a)	7.21	50.50
		Positive Rank	5(b)	5.50	27.50
		Tie	4(c)		
		Total	16		
Distinguishing Facts from Opinions	Post - Pre	Negative Rank	5(a)	5.70	28.50
		Positive Rank	5(b)	5.30	26.50
		Tie	6(c)		
		Total	16		
Making Inferences	Post - Pre	Negative Rank	3(a)	6.33	19.00
		Positive Rank	7(b)	5.14	36.00
		Tie	6(c)		
		Total	16		
Forming Judgments	Post - Pre	Negative Rank	5(a)	4.10	20.50
		Positive Rank	6(b)	7.58	45.50
		Tie	5(c)		
		Total	16		

a Post-test Score < Pre-test Score
b Post-test Score > Pre-test Score
c Post-test Score = Pre-test Score

Test Statistics (c)

		Post test Score – Pre test Score
Identifying the Viewpoint	Z	-1.508(a)
	Asymp. Sig. (2-tailed)	.132
Comparing Sources	Z	-1.508(a)
	Asymp. Sig. (2-tailed)	.132
Recognizing the Author's Purpose	Z	-.965(b)
	Asymp. Sig. (2-tailed)	.334
Distinguishing Facts from Opinions	Z	-.105(b)
	Asymp. Sig. (2-tailed)	.917
Making Inferences	Z	-.890(a)
	Asymp. Sig. (2-tailed)	.374
Forming Judgments	Z	-1.143(a)
	Asymp. Sig. (2-tailed)	.253

*$p < 0.05$
a Based on negative ranks.
b Based on positive ranks.
c Wilcoxon signed-ranks test

Table 4 shows three ranks of students. The negative ranks are students who received lower post-test scores than pre-test scores. The positive ranks are students who received higher post-test scores than pre-test scores. Finally, the equal ranks are students who had the same scores for the pre-test and post-test.

The next table shows the test statistics of all critical reading skills improved insignificantly at the 0.05 level ($p \geq 0.05$).

5. Discussion

5.1 Effects of RBLSM on the students' critical reading skills

RBLSM is designed to enhance students' critical reading skills; however, comparison of the pre-and post-test scores reveals there to be insignificant improvement in the students' critical reading skills. There are many issues regarding research-based learning, including workload, reliability of the sources, text difficulty, passive and dominating roles of students, and time constraints.

1) RBLSM requires students to collect data from sources during the *figure-it-out* stage. Students encounter a workload problem and may not be able to manage it. This situation discourages students from completing their reading tasks for research projects.

As stated by Miller-Cochran and Rodrigo (2011), students often find themselves overwhelmed and struggle with a great deal of information while collecting data.

2) The reliability issue of the information sources discourages students in reading for research projects. The students tend to search for information only from the internet where a large amount of information can confuse them. Students find it hard to find reliable sources when using such means.

The problem with the reliability of information on the Web is another issue that students encounter when they start doing research on the internet because there is no authority to monitor the reliability of the information posted. Searching for information from the internet can cause students challenges concerning questionable and credible information (Quinlan, 1997).

3) Text difficulty on the internet, namely, the variety of language structure, difficulty level, and text organization could discourage students in pursuing their reading tasks. Marchionini (1988)

also asserted that the internet issue is one that can create students difficulties and lead to serious problems. The endless amounts of information can easily distract them and waste their time.

The hidden purpose of the author is another characteristic of the text difficulties that can challenge readers with little experience. Students may find recognizing the author's purpose difficult because authors often have a hidden purpose or combination of purposes. This may explain the regression of students' pre-and post-test scores for the skill of recognizing the author's purpose.

As Pirozzi, Starks-Martin, and Dziewisz (2008) emphasized, recognizing the author's purpose may be challenging to readers with little experience. This could result in difficulty in making decisions when the reliability of the sources is questionable.

Another aspect of text difficulties is that of distinguishing facts from opinions. This may explain the regression of students' scores in the pre-and post-test for the skill of distinguishing facts from opinions. As stated by Spache and Spache, 1964, facts and opinions are difficult to distinguish. Facts are often presented in a biased manner. Recognized omissions, distortions or unverified facts are challenging for readers. In contrast, opinions are often stated in factual terms that make them more difficult to recognize. When evaluating facts and opinions, students need to consider their sources as to whether reliable facts and opinions are presented in an unbiased manner (Pirozzi et al., 2008).

4) The passive role of some students could reflect the ineffectiveness of students' learning where RBLSM requires active learners to exchange ideas in discussion groups. The passive behaviors of some students – 'free riding' – in group work were observable in the classes. Free riding occurs when some students in a group contribute very little to the group or sometimes avoid doing any group tasks. As stated by Wallace (2003), critical reading skills need active participants where students question the contents and reflect upon the topics. Some students still behave as passive learners. In many classrooms, students do not reflect upon or are not invited to reflect upon the reading materials (Wallace, 2003).

5) The dominating role of some students could also be one factor that affects the effectiveness of students' learning. RBLSM requires every student to communicate and negotiate meaning equally as regards the reading materials in group activities, namely group discussions and presentations. Another explanation could be that of dependent behaviors in which the students stop working actively if they view that another can do better, or if they themselves are just not confident in doing the tasks. This phenomenon is the power issue of 'inclusivity' that one needs to be aware of when adopting inclusive scholarly communities into learning (Brew, 2006). We must be aware of the power issues that determine different positions within the group setting. Some students, especially those with less prior knowledge and understanding, are treated differently when they engage in learning activities. In order to achieve inclusivity, students need to trust that other group members have something to contribute because different students have different things to learn and to contribute, no matter their level of prior knowledge and understanding (Brew, 2006). For critical reading instruction, Spache (1964) also emphasized that students take on active roles in discussions to compare reading materials or their own experience. The judgments, inferences, and conclusions drawn by different students in a group help develop critical reading skills (Spache, 1964).

6) The duration of the course implementation might have been insufficient for the development of critical reading skills. RBLSM took the thirteen weeks of a semester which may not be long enough to exhibit a significant improvement. This reason may present another challenge for this study. Many studies have indicated that higher-order skills need to be developed over a period of time, and it has as yet not been established what is precisely the appropriate time for the individual to make progress in the area. Crookes and Lehner (1998) stated that "developing critical reading and thinking skills is not an easy task, and teachers should not expect L2 learners to improve their critical thinking skills dramatically over a short period of time. Moreover, it is not possible to develop students' critical literacy skills through spoon-feeding them with an inflexible recipe for reading and thinking critically and requiring them to implement it perfectly right away, as teaching about critical thinking in a prescriptive and uncritical manner has an opposite effect. Moreover, the English subjects of secondary

school focus on reading for main ideas and extensive reading with there being no course for critical reading skills. Learning the new skills could be challenging for learners.

In summary, based on the finding of the insignificant improvement in students' critical reading skills, many factors including workload, reliability of information from the internet, the combination of purposes, difficulty of verifying facts and opinions, passive and dominating roles of students and time constraints may have influenced the development of their critical reading skills. Despite the fact that the statistics show there to be no significant improvement in the critical reading skills as measured by the pre-and post-tests, there are still benefits gained from using RBLSM. However, these benefits cannot be seen from the pre- and post-tests.

6. Conclusion

This study investigated students' English critical reading skills through the intervention of an RBLSM course. The findings indicated that RBLSM insignificantly improved students' critical reading skills. The findings from the interview revealed that the skills of making inferences and drawing judgments were more challenging to the participants than the skills of investigating sources, recognizing the author's purpose, and distinguishing facts from opinion. Some explanation for the difficulties of the skills improvement might involve the workload related to research activities, reliability of the sources, text difficulty, passive and dominating roles of the students, and time constraints of the treatment. Taking these issues into consideration will facilitate students' learning and lead to the successful improvement of the target skills.

7. Acknowledgements

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9. Appendix

Appendix A

The critical reading test

Instruction: There are six passages. Read each passage and answer the questions on the answer sheet.

Passage 1

Your brain can do so many more things than you might imagine. So, if we have such a powerful brain, why is it that we're not all good at everything? Why are some of us forgetful? The brain differs from person to person. The development of our brain is based on how we learned when we were children. However, this doesn't mean you cannot improve a mental ability that you consider weaker than another. It's wrong to think that just because you're not naturally gifted at something, such as math or map reading, that there's no point in trying to improve it. Your brain is similar to any *muscle in your body* in that exercise will raise its ability. You can always keep practicing and expand your current brain potency.

Passage 2

Dr. John Medina, the director of the Brain Center for Applied Learning Research at Seattle Pacific University, suggested in his book "Brain Rules" that exercise boosts our brain power. Exercise gets blood to your brain. When you exercise, you increase blood flow across your body. Blood flow brings food and oxygen to everywhere in your brain and cleans up the waste. The more you exercise, the more food you feed your brain, and the more toxic waste you can remove. This happens all over the body. That's why exercise improves the performance of most human functions. The same happens in the human brain. This way, your brain becomes healthier. Medina also suggests that integrating exercise into our eight hours at work or school would only be normal.

1. What does passage 1 try to tell us?
a. Our weaknesses can be improved.
b. We should improve math and map reading.

c. If you are gifted at something, there is no point in improving your brain.
d. We can always improve our mental ability.

2. Why does the author mention "*muscle in your body*" in passage 1?
a. To show that our body and brain are related.
b. To give us a clearer picture of how our brain works
c. To convince us that our brain is a muscle like others in our body
d. To give an example of the muscle in our brain

3. According to passage 1, why do our brains develop differently?
a. Because we are not all good at everything.
b. Because we are different in our weaknesses and strengths.
c. Because we have different experiences when we are young.
d. Because all of us cannot be geniuses.

4. Which of the following can be inferred about the brain from passage 1?
a. Our brain is powerful, so we can remember everything.
b. We can be good at everything, if we are gifted.
c. Education plays an important role in brain development.
d. Our brain can be improved if the muscle in the body is developed.

5. From passage 1, what do you think about how the author presents his/her ideas?
a. He/she does not give clear supporting evidence.
b. He/she gives good reasons supporting brain development.
c. He/she presents opinions very clearly.
d. He/she presents facts effectively.

6. What is the author of passage 2 trying to tell us?
a. We should eat protein from fish to improve our brains.
b. Our brain contains blood and oxygen.
c. Our brain and body need some practice.
d. To improve brain power, we should exercise.

7. According to passage 2, why does the author mention "*Dr. John Medina, the director of the Brain Center ….in his book "Brain Rules""*?

a. He is making the message more convincing by citing a source.
b. He provides the author's background to advertise the source.
c. He is convincing us to buy a famous book.
d. He suggests that Dr. Medina is famous as a result of writing the book.

8. According to passage 2, what happens when we exercise?
a. Exercise takes glucose to our brain.
b. Blood flow brings oxygen to our brain and gets rid of waste.
c. Toxic electrons are increased when we exercise too much.
d. Our brain needs protein from exercising.

9. In passage 2, what can we infer about "*integrating exercise into our eight hours at work or school would only be normal*"?
a. During office hours, employees should go to a fitness centre.
b. We should try to find time during the course of a normal working day.
c. People should exercise for eight hours.
d. Those who do not exercise will be abnormal.

10. In passage 2, the author _____.
a. provides only facts about the brain
b. is not good at science
c. is an expert in the field
d. gives a clear example about exercise

11. What is the difference between the two passages?
a. Passage 1 gives examples of ways to practice your brain, but passage 2 does not suggest any examples.
b. Passage 1 gives more facts on brain development than passage 2.
c. Passage 1 focuses on ways to improve your brain, but passage 2 stresses on ways to exercise your brain.
d. Passage 1 doesn't cite trusted facts, but passage 2 does cite more realistic facts.

Passage 3
As students spend more time practicing an activity, they notice their skills improve, and they get more confidence. In 2006 psychologists at the Democritus University of Thrace and the University of Thessaly in Greece surveyed 882

students on their feelings toward and playing sports during a two-year period. They found that students' feelings and practicing are strongly related. The relation worked in two ways – practice made students more likely to consider themselves good at a skill, and a feeling of being good at something would help them stay longer practicing that activity. Similar studies in music and academics support these findings.

Passage 4
Students who strongly believe that they can achieve their goal are more likely to do difficult work and stay longer on that work. These students will try hard to finish their work and believe that they can control failure without blaming other factors. Students who believe in themselves also recover quickly from failure, and finally are likely to complete their goal. On the other hand, students who do not believe in themselves cannot be successful and tend not to try hard on a job. These students are likely to avoid difficult work and finally this may result in poor studying in class.

12. What does Passage 3 try to tell us?
a. Practicing a skill makes us feel more confident in that skill.
b. Students should notice what they are good at.
c. Students feel good when playing sports.
d. Playing any sport is good for every student.

13. Why does the author mention " *psychologists…surveyed 882 students*" in passage 3?
a. Because he/she wants to show that a large number of students were interviewed.
b. Because the 882 students felt good while they were playing sports.
c. Because he/she is trying to convince readers of his/her argument by citing a related research study.
d. Because the students are from the Democritus University.

14. According to passage 3, why do students need to practice skills?
a. Because it can increase their confidence.
b. Because it can help them to learn a subject.
c. Because they have to be able to play sports.
d. Because they have to do things they cannot do.

15. According to passage 3, which of the following can be inferred about our feelings?
a. Feeling good about yourself takes time and practice.
b. If students want to feel more confident, they need to spend more time practicing a skill.
c. Playing sports has more benefits than you think.
d. If anyone wants to play a sport, they need to feel good about it first.

16. What do you think about how the author of passage 3 presents his/her ideas?
a. His/her information is supported by a well-planned study.
b. His/her opinion is unbelievable.
c. He/she does not present any facts to support his/her idea.
d. He/she has some bias on the topic.

17. According to passage 4, what is the author trying to tell us?
a. Students should try harder to finish their work.
b. Students must not avoid difficult homework.
c. Students who believe in themselves should work harder than others.
d. Believing in yourself helps you complete difficult work.

18. From passage 4, does the author have any bias towards the topic?
a. Yes, because he/she mentions that students without self-confidence will not be successful.
b. No, because he/she mentions both sides of the topic.
c. Yes, because he/she does not mention the disadvantages of self-confidence.
d. No, because he/she mentions many interesting things about being self-confident.

19. According to passage 4, why do some students recover quickly from failure?
a. Because they believe that they will never fail again.
b. Because their goal is easier to complete.
c. Because they feel confident that they can do it.
d. Because they blame other people for their failure.

20. It is suggested in passage 4 that_____
a. hard work helps students complete their goal.
b. believing in oneself can help students learn quickly.
c. students should control failure in their work.
d. staying with a problem longer is beneficial for every student.

21. What judgment can you make about the author's presentation?
a. The author does not support the ideas with any facts
b. The author uses reliable sources.
c. The author supports his idea with a clear example.
d. The author uses emotional words.

22. What is the difference between passages 3 and 4?
a. Passage 3 cites an unrealistic source, but passage 4 cites a valuable source.
b. Passage 3 gives solid supporting evidence, but passage 4 does not give any evidence.
c. Passage 3 gives more examples than passage 4.
d. Passage 3 gives only facts but passage 4 provides both facts and opinions.

Passage 5
Steve Jobs was the most innovative leader in our time. According to his interview with Forbes Magazine on 1st April, 2011, he gave a secret of success that anyone can use – do what you love. You must follow what your heart tells you to do. Carmine Gallo, the interviewer, believed that is the main reason for Mr. Job's success. Steve Jobs once told a group of employees, "People with passion can change the world for the better. It's very difficult to come up with new and creative ideas unless you are passionate. Passion is like fuel for a rocket. Passion is happening only when you really love what you are doing. I'd get a job as a busboy or something until I figured out what I was really passionate about", said Jobs.

Passage 6
One of the worst pieces of career advice that I bet each of you has gotten is "to do what you love."
Here's some practical advice: Do not do what you love; do what you are. It's how I chose my career. I bought the book with that title – maybe my favorite career book of all time. The book gave me a list of my strengths, and a list of jobs where I

would likely succeed in based on those strengths. It's a myth mostly propagated by people who tell you to do what you love. Doing what you love will make you feel fulfilled, but you may not get paid for it.
So if you are overwhelmed with the task of "doing what you love", you should recognize that you are totally normal. Maybe you should just forget it. Just do something that suits your strengths. Do anything!

23. What does passage 5 try to tell us?
a. Steve Jobs was the most innovative leader in this century.
b. Finding what you are passionate about was the secret of Jobs' success.
c. Following your heart can change the world.
d. Without love, it is difficult to think of new ideas.

24. What is the author's purpose of talking about Steve Jobs' success in passage 5?
a. To convince the reader by giving a clear example of doing what one loves.
b. To convince the reader that Jobs is the most successful businessman this decade.
c. To inform the reader that Jobs can really change the world.
d. To inform the reader that people need passion for their love lives.

25. According to passage 5, what is Jobs' opinion about passion?
a. All employees must have passion to create new products.
b. New ideas can emerge easily without passion.
c. Rockets need fuel for taking off.
d. Passion is very important for success.

26. According to the last sentence of passage 5, which of the following can be inferred from "I'd get a job as a busboy…passionate about"?
a. Passion can lead to new and creative ideas.
b. Discovering what one loves takes time.
c. People with passion always succeed.
d. People with passion work fast like a rocket.

27. According passage 5, what judgment can you make about the author's presentation?
a. The author strongly believes that Jobs is a clear example of how to become successful

b. The author strongly believes that being the most innovative leader is the key to success.

c. The author is good at interviewing celebrities and convincing readers.

d. The author admires the creativity of Steve Jobs and wants readers to love him.

28. According to passage 6, what is the author's viewpoint?

a. Do not believe in career advisors.

b. To do what you love is useful but out of date.

c. Doing what you are capable of is the key to success.

d. Finding your strengths can help you get a job.

29. Why does the author mention "*the worst pieces of career advice*" in line 1 of passage 6?

a. He/she tries to get the readers' attention.

b. He/she provides us with useful advice for finding a good job.

c. He/she convinces us to find a job we love.

d. He/she is informing us about the bad advice we are often given.

30. According to passage 6, what is the author's opinion about "*Doing what you love...not get paid for a job*"?

a. Doing what you love will make you poor.

b. You may not earn much from what you love.

.

c. Doing what you love will make you successful.

d. Being who you are will make you happy.

31. According to passage 6, what can we infer from "*So if you are overwhelmed...you are totally normal*"?

a. You should find a new job.

b. You should know that you are wrong.

c. Many people do what they love.

d. Many people face the same situation.

32. What judgment can you make about the author's presentation?

a. The author provides facts to support his idea

b. The author provides well-supported reasons.

c. The author uses unbiased language.

d. The author uses many emotional words.

33. What are the differences between passages 5 and 6?

a. Passage 5 provides less useful opinions than passage 6.

b. Passage 5 provides clearer facts about finding a job than passage 6.

c. Passage 6 provides more reliable facts about finding a job than passage 5.

d. Passage 6 provides less reliable facts about career advice than passage 5