

Effects of Using the KWL Chart on Fostering EFL University Students' Critical Reading

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Abstract

The purposes of this study were to investigate the use of the KWL chart in improving university students' English critical reading comprehension and to investigate how those students processed the KWL chart to activate the use of metacognitive strategies when they studied critical reading. The population was university students majoring in English for Communication, with a total of 120 students. Out of this population, purposive sampling was used to select 27 third-year students as a sample. The data were collected through an English critical reading comprehension test and students' reflective writing in the KWL chart. The data obtained from pre- and post-test were analyzed by using a pair sample *t*-test. The reflective writing in the KWL chart was coded and categorized, based on theories of metacognitive strategies. Frequency and percentage were used to analyze the use of metacognitive strategies when the students studied a critical reading course. The results showed that there was a significant difference in the scores for the pre-test ($M=19.00$, $SD=3.53$) and post-test ($M=34.19$, $SD = 6.61$) condition; $t(26) = -17.99$, $p = (.000)$. The findings from the students' reflective writings in the KWL chart revealed that the monitoring strategy was the most frequently used. Students used the monitoring strategy while they were reading and studying a critical reading.

Keywords: The KWL Chart, Students' Reflections, English Critical Reading, Metacognitive Strategies

Introduction

Reading is an active process because of the interaction between readers and texts [1, 2]. Once readers read, they need to transfer to their brains the information that they have received from the text. Therefore, different readers may construct different interpretations due to their experience and knowledge [1, 2].

Similarly, students are constantly confronted with current information, particularly when they progress to the upper elementary grades and transition from "learning to read" to "reading to learn" [1, 3, 4]. They are encouraged to read to learn. They need to integrate new information into their existing knowledge base, synthesize it, and create new knowledge in order to believe as needed [3, 4].

Nevertheless, students who study English as a foreign language (EFL) have started learning how to read the foreign language through systematic instruction in phonics, the use of scope and sequence charts, and practice in isolated skills [1, 5, 6, 7]. Many of the students might develop a bottom-up view of reading (e.g., phonics and phonemic awareness), interacting with text with the ingrained purpose of pronouncing words and mastering the details the writers had described in their writings, instead of synthesizing and analyzing [5, 7]. Thus, when

the same students move to higher levels, like colleges or universities, they may be required to independently process an enormous amount of reading material and may be expected by many of their professors to be critical and responsive constructors of meaning [3, 5, 8]. In such conflicting conditions, students may perform worse in their reading comprehension [5, 8, 9]. Furthermore, misunderstanding the text and the lack of background knowledge of cultural competence in the reading of texts written for native speakers of English also affect EFL students' reading comprehension [8, 10, 11]. Accordingly, critical reading comprehension has also been neglected in the students to practice [8, 11]. This is because critical reading tends to put too much emphasis upon the text as a product and too little emphasis upon the processes of producing and interpreting text [8, 10, 11].

Like the situation of Thai university students, studying English as a foreign language, even though, the content of their curriculum in the university has been developed to encourage the students to read the foreign language critically, they cannot operate effectively. Since they have started reading English through systematic instruction in phonics and practice reading skills in isolated skills, they may lack practice in how to critically analyze the reading passages.

The KWL chart is a graphic organization chart designed by Ogle in 1986 [12]. The chart has been used as a part of reading activities in order to activate students' cognitive skills in reading comprehension and background knowledge, to establish what they want to get from the text they have read, and to reflect on what they have gained from reading the text [1, 4, 12, 13, 14]. The KWL chart consists of three columns, **Known-Want-Learned**, which not only enable students to comprehend the passages but also enable students to expand their critical reading. That is, students can connect their background knowledge with the new information, set a purpose for reading, gain self-awareness, expand ideas beyond the text while they are reading, and help them evaluate the information before making decisions [12, 13, 15]. Furthermore, the chart promotes students to advance their critical thinking skills because the students have to divide the information into smaller pieces, and they need to plan before reading [9, 11]. Accordingly, some researchers [4, 11, 13, 16] have applied the chart as a tool to elicit students' critical reading.

Critical reading means being able to reflect on what a text relays, what it describes, and what it means by scrutinizing the style and structure of the writing, the language used, as well as the content [8, 11]. Students are able to become critical readers if they apply their background knowledge before and when they read, plan before they read, and make decisions after they read [8, 9, 11]. In addition to critical reading, metacognitive strategies are the strategies used in order to activate students' critical reading. The strategies could control students' learning processes, assist students to interact with the passages, as well as assist

them to raise their self-awareness while they are reading [8, 11]. The metacognitive strategies are comprised of thinking about the learning process, planning for learning, monitoring a learning task, and evaluating how well a learner has learned [17].

As the interaction processes in the reading cannot be observed and happen in a split second inside the readers' minds, it might be difficult for teachers to monitor students' comprehension and how they use strategies [5]. In addition, there are not many research studies investigating the use of the KWL chart in English critical reading in foreign language classrooms focusing on university levels [4, 8, 11, 14, 16]. Consequently, the KWL chart was employed to investigate how Thai university students construct their English critical reading comprehension and the processes of how they apply metacognitive strategies to benefit their critical reading comprehension.

Objectives

1. To investigate EFL university students' English critical reading comprehension after they were taught with the KWL chart.

2. To investigate how EFL university students used the KWL chart to process their metacognitive strategies when they read and study critical reading.

Methodology

The mixed methods procedure, explanatory design, was used in which the qualitative findings could help to explain, refine, clarify, and extend quantitative results [18-19]. In this study, a pair sample *t*-test was used to compare the participants' English critical reading comprehension before and after they were taught by using the KWL chart. The qualitative data from the participants' reflective writings in the KWL chart were used to explain how they processed metacognitive strategies when they studied and used critical reading. The reflective writings were coded and labeled, based on the theories of metacognitive strategies [15, 17, 20]. Subsequently, frequency and percentage were used to calculate how many times the participants processed the metacognitive strategies. The research procedures were as follows.

1. Population and sample

The population was 120 university students majoring in English for Communication (International Program) at a private university in Bangkok, Thailand. Purposive sampling was used to select 27 third-year university students as a sample group. The group was an intact group. They were selected because they had studied basic reading and reading comprehension as compulsory courses before they studied a critical reading course. Participants were males

and females. There were 20 Thai, four Turkish, and three Chinese participants. Their language proficiency, based on TOEIC test scores, was between 300-550. That is, they were able to make inferences and locate the correct answers to factual questions. They were also able to understand vocabulary and paraphrase information from the text. Furthermore, they were able to understand common, rule-based, grammatical structures, in addition to making correct grammatical choices, even when other features of the language, such as difficult vocabulary or the need to connect information, were present.

2. Data collection

The data collection consisted of two phases: 1) developing research instruments: an English critical reading comprehension test, the reflective writing in the KWL chart, and the coding schemes of metacognitive strategies; and 2) conducting the main study.

2.1 Research instruments

2.1.1 The English critical reading comprehension test

In the first phase, the English critical reading comprehension test was developed and checked to ensure its validity. The test was a criterion reference test, which was developed based on the framework of [21]. The test consisted of five passages, with 30 items in total. Each passage was followed by six items (multiple choice and short answer questions). The content of the test was derived from the course description of critical reading, which was comprised of differentiating the topic, topic sentence, and main ideas, identifying the authors' purpose and tone, differentiating between fact and opinion, making inferences and drawing conclusions, and evaluating arguments. The participants studied this course for three hours per week. The test was validated by three experts through the item objective congruence (IOC) Index. The items that had scores lower than 0.5 were revised while the items that had scores higher than or equal to 0.5 were preserved. The test was administered to 20 students who were not in the main study. The standardized alpha for the questions (KR-20) was .70.

2.1.2 The reflective writing in the KWL chart

The reflective writing in the KWL chart was designed based on [12]. The reflective writing in the KWL chart was experimented with in a pilot study. The pilot study was used to reduce the problems which might occur in the main study. The pilot study was conducted two weeks before the main study. The participants were asked to attend an orientation. The researcher gave an explanation and let the participants practice how to use the KWL chart and how to write their reflections in the chart. The steps of using the KWL chart, adapted from [12], were as follows.

1. The participants were asked to draw the KWL chart from the board onto their notebooks. Then, they were taught the steps of completing the chart and how they could fill in the three columns of the chart. The participants could ask questions if they were confused.

2. The participants received the topic of critical reading from the board. They discussed the topic with the researcher and their classmates. In this stage, the researcher guided the participants to think of what they had known about the topic and how they could comprehend the reading passage. The participants brainstormed about what they had known related to the topic and how they could recognize the topic.

3. After the participants discussed what they had known about the topic, they wrote it in English in the K (Known) column in their notebooks. They were allowed to write in words, phrases, or sentences.

4. The next step of the KWL chart was the W (Want to know) column. The participants were told to express what they wanted to know about the topic or the reading passage. They had to write questions, not statements, in their notebook. The steps in the K column enabled the participants to interrelate information and connect it with what they had already known and what they wanted to know more about.

5. When the participants had completed the K and the W columns, they were instructed to read the text and fill in the L (Learned) column. The participants had to look for the answers to the questions in the W column while they were reading. After class, the participants completed the L column. They had a period of time one day to review their charts before they submitted them to the researcher.

6. A few days later, the participants received their KWL charts from the researcher. If they saw some questions, they had to answer them.

2.1.3 The coding schemes

The coding schemes were developed based on the theories of metacognitive strategies [9, 17, 20]. The coding schemes consisted of the processes for planning before they studied critical reading, monitoring how they could comprehend critical reading passages, and evaluating how they had identified or analyzed error patterns to develop an action plan for transforming mistakes into future successes. The following are examples of descriptions of metacognitive strategies used in the coding schemes.

Table 1 Examples of the descriptions used in the coding schemes

Category	Description
Planning strategy	<ul style="list-style-type: none">• Participants indicate strategies used to find information, such as identifying a topic, topic sentence, or main idea, analyzing the author’s purpose, differentiating facts and opinions, and evaluating arguments
Participants plan what they do before they read or study a critical reading course	<ul style="list-style-type: none">• Participants indicate a list of ideas from simple to important information• Participants indicate things that could connect and transfer what they had known before reading or studying

To try out the coding schemes, the participants’ reflective writings from the pilot study were chosen. Two coders independently coded the reflections and discussed the results. In general, they agreed on the coding, but there were some limitations and discrepancies. The coding scheme was then revised for the main study.

2.2 The main study

For the main study, the participants took an English critical reading comprehension test for 90 minutes before they studied the critical reading course. The participants studied the critical reading course for 10 weeks. As they studied this course for three hours per week, the KWL chart was written once a week in the class. The steps for using the chart in the main study were as follows.

1. The participants drew the KWL chart within their notebooks. Subsequently, they received the topic of critical reading from the board. Each topic was studied for two weeks. However, the participants needed to submit their charts every week after they finished studying. The topics of the critical reading course consisted of discussing the definitions of critical reading and identifying ideas in the reading passage, distinguishing between fact and opinion, determining the author’s purpose, tone, and point of view, making inferences and drawing conclusions, and evaluating arguments.
2. When the participants studied in class, they discussed the topic with the researcher and their classmates for approximately 30 minutes. Subsequently, they spent 30 minutes writing their ideas in English within the K column. The participants could write in either words, phrases, or sentences.
3. After the participants finished the K column, they were encouraged to express what they wanted to know about the topic and wrote it in the W column. For example, the

participants might ask themselves how they could correctly distinguish between facts and opinions in the passage. The participants spent 30 minutes on the W column.

4. When the participants completed the K and the W columns, they had 60 minutes for reading the passage. When they read the passage, they could also discuss it with their classmates. After class, the participants expressed what they learned in the L (Learned) column. They had one day to review their reflective writing. The participants submitted their charts to the researcher on the following day.

5. A few days later, the participants received their KWL chart from the researcher. If they saw some questions in their charts, they had to answer them. For example, the participants might be confronted with: “How could you find this answer?” “How did you learn about this topic?” “Did your steps of reading mentioned in your KWL chart help you?”

Ten weeks later, the participants again took the English critical reading comprehension test which was the same as the test that they had taken before the main study. They spent 90 minutes completing the test. The participants’ reflective writings in the KWL chart were also collected to check the frequency of using metacognitive strategies when they studied and performed critical reading.

2.3 Data analysis

The scores from the pre-test and the post-test of the English critical reading comprehension test were calculated by using a paired sample *t*-test. The two copies of the 27 participants’ reflective writings in the KWL chart for 10 weeks and the coding schemes were distributed to two coders to check the frequency of the metacognitive strategies used. One coder checked 10 reflective writings per participant, so each coder checked 270 reflective writings. The reflective writing in the KWL chart was identified and assigned with the letter P, the letter W, and numbers from 1 to 27. The letter P refers to the participants and the letter W refers to the week. If there were italics presented, it meant the participants corresponded to the strategies being discussed. After that, two coders compared their findings. If there were some disagreements, the coders discussed them again. Frequency and percentage were used to analyze the processes of the metacognitive strategies that were used among the participants.

Results

To answer the first objective, a paired sample *t*-test was performed to compare students’ improvement in critical reading comprehension before and after they were taught by using the KWL chart. The results are shown as follows:

Table 2 A paired sample *t*-test with results comparing the pretest and the posttest

Scores	n	M	SD	<i>t</i>	df	<i>p</i>
Pretest	27	19.00	3.53	-17.99	26	.00*
Posttest	27	34.19	6.61			

*The significant value at .05

As presented in Table 2, there was a significant difference in the scores for the pre-test ($M=19.00$, $SD=3.53$) and the post-test ($M=34.19$, $SD=6.61$) condition; $t(26) = -17.99$, $p = (.000)$. The results indicated that there were significant differences in EFL students' critical reading comprehension achievement after they were taught by using the KWL chart.

To answer the second objective, the findings from the participants' reflective writing in the KWL charts were categorized based on the designed coding schemes.

Table 3 presents the frequency and percentage of the metacognitive strategies used among the participants.

Table 3 Metacognitive strategies used when reading and studying critical reading

Metacognitive strategies	Frequency	%
Planning strategy		
Plan what they should do before reading or studying a critical reading course		
• which reading strategies should be used to find information, such as identifying a topic, topic sentence, or main idea, analyzing the author's purpose, differentiating facts and opinions, and evaluating arguments	20	5.00
• list the ideas from simple to important information	30	7.50
• connect and transfer what they had known before reading or studying	110	27.50
Subtotal	160	40
Monitoring strategy		
Report how they can comprehend the critical reading passages		
• connect to their background knowledge or previous strategies that they had learned	180	45.00
• explain the steps they take in problem-solving	41	10.25
Subtotal	281	55.25
Evaluating strategy		
Identify error patterns and use error analyses to develop an action plan for transforming errors into future successes	19	4.75
Subtotal	19	4.75
Total	400	100

As presented in Table 3, the participants frequently used a motoring strategy, a planning strategy, and an evaluating strategy, respectively. The monitoring strategy was the most frequently used strategy whereas the evaluating strategy was the least frequently used strategy. The participants used mostly the monitoring strategy in order to connect to their background knowledge or previous strategies while they were reading and studying critical reading. The examples of participants' reflective writing corresponding to the metacognitive strategies are discussed as follows.

Monitoring strategy

The analysis of participants' reflective writing showed that the monitoring strategy was the most frequently used strategy. 55% of the participants applied this strategy to report how they could comprehend the critical reading passages. Nearly half (45%) of the participants used the monitoring strategy to connect to their background knowledge or previous strategies while they were reading and studying critical reading, and 10% of the participants used the strategy to explain steps they took in problem-solving. The following are examples of their reflections.

The participants reported that while they read, they connected to their background knowledge, such as personal experience, previous reading strategies, and reading courses, to understand reading or study critical reading.

P27W1 (The participant was reading a long passage to find the main ideas.) The easiest way to understand this passage is by *separating the points into small pieces*. I also *highlighted and underlined the keywords*. Those helped me either answer the questions or try to understand the elements of key points. (The participant applied reading strategies, namely, finding keywords, highlighting, and underlining keywords that they studied in the basic reading course.)

P16W5 (The participant was reading the passage to identify the author's purpose.) While I was reading, *I used the knowledge that I had known to identify the purpose of the author. For example, this passage was about selling something. The purpose of the author might be to persuade someone to buy their products. Thus, the passage might provide some benefits that could persuade customers*. (The participant connected to their personal experience that when people would like to sell their products, they might give the advantages of the products to the customers.)

The participants explained the steps they took when they had problems while reading and studying critical reading.

P4W2 (The participant finished identifying the main ideas.) To help me comprehend this passage, I *skimmed through the keywords in the reading passage first and translated what they meant in my brain*. (The participant applied previous reading strategies, skimming, and translation when they were reading the passage.)

P13W2 (The participant finished identifying topics, topic sentences, and main ideas.) While I was reading the passage, I *read the questions to guess what the passage focused on. When I understood the questions, I read the passage quickly to find the answer*. If I couldn't find the answer, I would reread the passage. But this time, I read it slowly and carefully. (The participant applied the skimming and rereading strategies practiced in the basic reading course to the critical reading course.)

Planning strategy

The analysis of participants' reflective writing showed that 40% of the participants applied a planning strategy to plan what they should do before they read or studied critical reading. A total of 27% of the participants used mostly the strategy to connect and transfer what they had known before they read or studied critical reading. A total of 7% of the participants used the strategy to list the ideas from simple to important information, and 5% of the participants used the strategy to plan which reading strategies should be used to find information. The following were examples of their reflections.

The participants planned to connect and transfer what they had known before they read or studied critical reading.

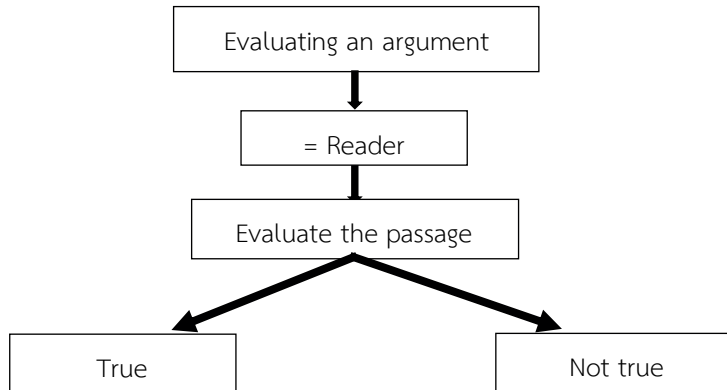
P7W3 (The participant was identifying facts and opinions in the reading passages.) To find facts and opinions, I think I *should find clues shown in supporting details. For example, the sun is hot. The word "hot" is an opinion*. (The participant applied using the context clues which they had studied in a basic reading course to their current reading passage.)

P25W7 (The participant was studying making inferences.) I've known that if I read the passage, and the idea of the writer is not clear, I *will use my background knowledge to guess what the writer's idea is. For example, if the passage shows that "She was drunk, but she drove," I will think that she may break the law because when she gets drunk, she should not drive*. (The participant connected her personal experience to the current situation.)

The participants planned to list the ideas from simple to essential information.

P13W9 (The participant was studying evaluating an argument.) He/ she drew the

graphic organizer on the KWL chart to summarize his/her ideas before studying.



(The participant summarized the points through the graphic organizer that they had practiced previously in the reading comprehension course.)

P21W9 (The participant was, for the first time, studying about evaluating an argument.)

For me, if I had to evaluate the argument in the reading passage, *I might outline the reason to support the claim. Then, I carefully read and observed the writer's emotion and purpose shown in the passage.* (When this participant listed the essential points before reading, he/she applied former reading strategies (e.g., outlining, identifying the author's tone and purpose.) learned in other reading courses to help them comprehend and evaluate the arguments.)

The participants planned to apply the strategies before they read or studied critical reading.

P14W3 (The participant was identifying facts and opinions in the reading passages.)

When I read the passage, *I think I will read sentence by sentence carefully and discuss with my classmates* whether my ideas were correct or not. (The participant applied a group discussion strategy before he/she made decisions.)

P18W4 (The participant was identifying facts and opinions in the reading passages.)

I think before I identify whether supporting details are facts or opinions, *I should skim through the whole passage quickly to understand the passage first.* (The participant planned to apply skimming strategies that they had practiced in a basic reading course to help them understand the whole passage when they identified the facts and opinions.)

P1W6 (The participants were studying how to identify the author's purpose.) Before

I read the short passage, I knew that *I should read the heading and conclusion*

first. So, when I read a long passage, I may read the heading, and then I read the last paragraph to get to the concept of the whole passage. (The participant applied the skimming strategies that they practiced in a basic reading course to help them comprehend a long reading passage.)

Evaluating strategy

The analysis of participants' reflective writing showed that the evaluating strategy was the least frequently used strategy. A total of 4% of the participants applied this strategy to identify error patterns and use error analyses to develop an action plan for transforming the errors into future successes. The following were examples of their reflections.

P10W6 (The participant finished identifying an author's purpose and tone.). When I did exercises about the tone of the author, I used my imagination to comprehend the passage. I guessed what the tone of the writer was about. *I thought guessing may not be a good strategy and not enough for me to recognize the tone of the writer. I think using imagination might be another good strategy for me to understand the reading passage.* (The participant evaluated in their reading that one strategy might not be enough to comprehend the passage. Thus, they applied another reading strategy.)

P3W9 (The participant studied evaluating an argument.) After I finished reading, I thought about what the information in the passage was about. Could I believe this information? For example, what did the passage focus on? What was the passage talking about, and what did the author intend to express? So, when I finished reading and I thought I didn't understand the passage. *I read the passage again to ensure whether I could understand that information and could answer the questions correctly.* (The participants evaluated their understanding. When he/she did not understand, they decided to use another reading strategy to help them better understand the reading passage.)

Discussion

Based on the results of the research, the results of the pre-and post-test showed that there were significant differences in the EFL students' critical reading comprehension achievement after they were taught by using the KWL chart. The findings from the participants' reflective writing also revealed that the monitoring strategy was the most frequently used strategy while the evaluating strategy was the least frequently used strategy. The participants used mostly the monitoring strategy to connect to their background knowledge while they were reading.

With reference to the results regarding the first objective, there were significant differences in the EFL students' critical reading comprehension achievement after they were taught by using the KWL chart. A possible explanation for the result could be attributed to the KWL chart, which could encourage the participants to be more active and more confident, as well as help them expand their ideas [1, 4, 11-13, 15, 16]. In the class, the participants were allowed to work in groups to discuss and share their ideas with their classmates before and after they read. The teacher worked as a facilitator to guide them when they had questions. Thus, the participants could practice their critical reading comprehension by themselves and share their ideas with their classmates without restriction.

In addition, the KWL chart could encourage the participants to become self-aware readers [4, 5, 12-13, 17, 20]. With reference to the findings from the participants' reflections in the KWL chart, they indicated that the monitoring strategy was the most frequently used strategy when the participants comprehended critical reading or studying. The participants used the KWL chart to monitor, either while they were reading or having some problems. Furthermore, the monitoring strategy was employed when the participants did not understand the lessons or reading passages. The chart was also used to plan what the participants could do before reading and evaluate their understanding after they read and studied [11].

Another possible explanation for the results might be attributed to the questions asked by the participants in the KWL chart [5, 9-10, 20]. The participants received the questions every week on their KWL chart that they had submitted to the researcher. The questions from the researcher might have stimulated the participants to gain more self-awareness before and while they were studying, as well as after they had finished reading. This was because the participants might have had an opportunity to review their prior explanation written in the KWL chart and to have considered what they had done when they read and studied. This could have encouraged them to gain more self-awareness when they read and studied [8, 9, 11, 17].

Conclusions

According to the results of this study, it might be concluded that the KWL chart could improve students' critical reading comprehension. The findings from the participants' reflective writing in the KWL chart showed that the participants frequently used monitoring, planning, and evaluating strategies, respectively. The monitoring strategy was the most frequently used strategy while the evaluating strategy was the least frequently used strategy. The chart assisted the participants to employ the background knowledge or previous reading strategies when they read and studied critical reading. In addition, when they encountered problems,

the participants could use the chart to explain the steps of their solutions in the critical reading.

In addition, it might be suggested that the KWL chart can be applied to the critical reading class to activate students' critical reading comprehension and metacognitive strategies. Teachers with other grade levels may apply this chart to their language classrooms. Also, when the teachers apply the KWL chart for their students to reflect upon their study, the teachers should write the questions in each student's chart that can challenge students' critical reading. For example, the teachers might ask each student these questions, "How do you know this?", "Could you please explain more?", or "How would you solve these problems?". These questions could activate students' self-awareness when they practice reading.

For further research studies, the researcher may investigate the effects of background knowledge on English critical reading comprehension. Additionally, further research studies may focus on the effects of critical thinking questions.

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