The Effects of Using KWL-Plus Strategy through Infographics on Thai EFL Students' Reading Comprehension Skills *

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Abstract

This study aims to investigate the effects of using KWL-Plus strategy through infographics on Thai EFL students' reading comprehension skills, and to explore their attitudes towards using KWL-Plus strategy through infographics in a face-to-face EFL classroom. The pedagogical intervention was implemented for an academic semester and aimed to help learners develop their reading comprehension skills based on the use of infographic as the main learning assignment. The convenience-sampled participants included 15 first-year students studying English major in Nakhon Sawan Rajabhat University, Thailand. The instruments were a pre-test, post-test, KWL-Plus student's infographics, as well as open-ended questions about students' views toward using KWL-Plus through infographics as instructional material. The statistics used for analysis were a Paired Sample T-test, Means, and Standard Deviation. The main findings from the study can be summarized in two areas: 1) there was a statistically significant difference in their mean scores ($p < 0.001$), which was higher than those of the pre-test after KWL-plus strategy was introduced to the participants; and 2) the result of the open-ended questions based on content analysis revealed that students were satisfied with using KWL-Plus strategy through infographics as instructional material to enhance reading comprehension skills. In addition, the students were encouraged to be active learners in a collaborative classroom environment by seeing the implementation of the KWL-Plus strategy through infographics while reading English passages.

Keywords: Reading comprehension, KWL-Plus strategy, Infographics

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Introduction and Statement of Problems

The advances in technology of the 21st century and today's wide scale of communication capabilities are having a profound effect on many aspects of teaching and learning (Beatty & Nunan, 2004). The use of computers in the classroom is becoming popular in second language and foreign language classrooms, as Smith (2005) points out, language teachers routinely integrate web-based activities as well as multimedia software into their course, and new generations of language learners are typically more and more proficient in using computer technology than those who came before. Due to advance-technology transfer from foreign countries, gaining new knowledge is primarily learnt through a medium of English so reading English passages becomes a central skill to learn new information.

According to Anderson (2002), learning to read in a second or foreign language is a process that involves learning skills, learning new vocabulary, as well as collocative patterns. Reading competence is important to Thai students as they are exposed to course texts, references, and online materials that are in English. However, it is often found in many EFL classroom that students' reading proficiency cannot be properly developed because they had limited lexical knowledge (Supatranont, 2005). Durkin (1993) also stated that most of EFL teachers have wondered what they might to do to improve students' reading skills, especially reading comprehension because it is considered a very complex process.

Additionally, most of students are passive in the class in which they are less involved in the learning experience, especially reading comprehension skills. Besides, some of them are not interested in reading English passages because they find many difficulties in vocabulary and finding main idea. In some cases, Thai English language teachers apply almost one set of reading strategies in a traditional method which no meta-cognitive strategies that increase L2 performance. To address the issues in Thai EFL classrooms, it is recommended that teachers adapt their strategy in teaching reading skills, and that they figure out the most effective and innovative teaching strategies to enhance students' reading abilities. In other words, the teacher should select appropriate strategy to make the teaching and learning process run smoothly.

Based on the student's problems in reading comprehension skills, the KWL-Plus strategy was used as a treatment in the experiment. The strategy would help passive students improve their reading comprehension skills, elicit their background knowledge, and reflect the understanding (Carr & Ogle, 1987). So, the researcher believes that the use of technology-integrated reading can be another alternative to connect students in the process of reading comprehension and motivate them to enjoy reading class. Moreover, the modern technological in English language education represents a significant advance in

contemporary English language teaching strategies and methods such as computerization, multi-media devices, mobile phones, visual effects applications, and social media. Strokes (2001) wrote the literature perspective based on visual literacy; the researcher suggested a way to control a reading class using visual enhancements in teaching, to promote the development of learners' visual skills in combination with their development of verbal reading. Therefore, the present study attempts to investigate the effects of using KWL-Plus strategy through infographics on Thai EFL students' reading comprehension skills. Meanwhile, student's attitudes towards using KWL-Plus strategy through infographics in EFL classroom will be investigated using qualitative analysis.

Literature Review

Reading comprehension

Reading comprehension is an interactive process that involves interaction between the reader and the text (Lismayanti et al., 2014). This is the main elements of reading because it refers to the ability to get the meaning of something in the text. A reader needs to use their cognitive abilities to comprehend the meaning of a written text. These cognitive abilities in reading are consisted of two skills; language comprehension and language decoding (Urquhart & Weir, 1998). The comprehension in each reading activity is an important part of skill learning. In order to perform reading comprehension skills, the reader must possess the background knowledge relevant to what they are reading. Moreover, a good reader is one who understands what he reads, and the faster he able to get meaning from his reading the more efficient he is.

KWL-Plus process: An instructional reading strategy

The KWL-Plus is considered as a metacognitive strategy that provide students with better opportunities of comprehending reading texts. The strategy was launched and developed by Ogle in 1986 and 1987 as a simple, active and powerful reading strategy. In Blachowicz and Ogle (2001) illustrate the procedures that the teacher and students undertake in the KWL-Plus strategy, where the teacher firstly starts by accessing prior knowledge what they know already about the topic, which refers to the' **'K'** (what the students **K**now) Secondly, the teacher begins to encourage his/her students to think about what they know about the topic and the general categories of information that should be anticipated, which refers to the **'W'** (what the students **W**ant to know). Then, thirdly, students write or fill out what they have learned in the classroom in the **'L'** column (What the students **L**earn). Teachers have them check their questions to determine if the article dealt with their concerns. If not, suggest

further reading to fulfill their desire to know. Last procedure is **'Plus'** column (mapping and summarizing). Maps require students to locate and relate the main ideas and supporting details of text into an organized whole. Through summarizing, students write a summary to reflect on what was learned in their own terms.

Infographics in EFL classroom instructions

Krauss (2012) defines *infographics* as "a visual display of information about a particular topic". Information and data can be visualized in various forms depends on the content, e.g., use of writings, image, illustration, map charts and table. The infographic design is about storytelling. Nowadays, infographics become more like articles or speeches than charts. Their purposes can be categorized into the same three objectives as public speaking: to inform, entertain, or persuade the audience because they have introductions to get readers' attention (Dur, 2014).

Infographics are also regarded as promising learning tools that can be adapted to any educational setting to enhance students' learning experience. Yimaz & Bilici (2018) conducted the study to explore postgraduate students' academic achievement while using of infographics. A total of 15 postgraduate of a large university in Turkey, participated in the study. The results of the study showed that students' metacognitive strategies scores increased over the four-week period. Their study also revealed that an infographic-based training process had a significant effect on academic achievement and metacognition skills, especially on facilitating the management of the learning process.

Conceptual Framework

Reading is an essential activity for students in all areas, and it is also one of the most significant courses in English. There are several methods for improving students' reading skills. Students can get some of the knowledge they require on a regular basis through reading. Students must be able to grasp the material they read in order to get the greatest results in the reading process.

In this study, the issue that occurs in English effective instructional procedures is the starting point for conducting the research. The problems are related to inadequate learners' level of reading comprehension competence. Based on the researcher's teaching experience at university level, it was found that the reading comprehension of the students was at a low level, and it needed to be improved. Therefore, this study is carried out to investigate whether the KWL-Plus strategy through infographics is effective. The researcher believes that KWL-Plus strategy is appropriate to be used in teaching process and suitable for Thai EFL students because it can enhance their reading abilities effectively. As

references and reviews of related theories for dealing with the challenge have been given. Here, the researcher provides the main conceptual framework in this section.
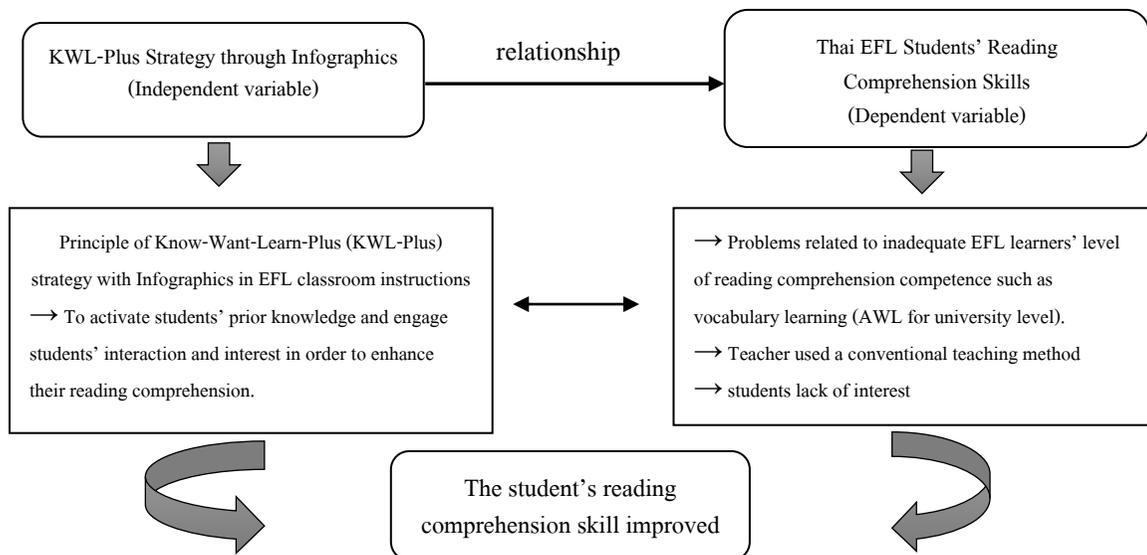

Figure 1: Conceptual Framework

Research Objectives

1. To investigate how the KWL-Plus technique significantly improves the students reading comprehension skills.

2. To explore students' views towards using KWL-Plus strategy through infographics to enhance students' reading comprehension skills.

Research Questions

Based on the problem and the related literature explained above, the present study aimed at finding the answers to the following questions.

1. Are there any significant differences in the scores of pre-test and post-test after KWL-Plus strategy is implemented in teaching reading comprehension?

2. What are students' attitudes toward the use of (KWL-Plus) metacognitive reading strategy through infographics as part of their reading process?

Methodology

Research Design

One-group pre-test post-test design were employed in order to examine EFL' students reading comprehension skills, their metacognitive strategies and their infographic creation process. The

variables were examined in this study, they were KWL-Plus strategy, reading as independent variable and students' reading comprehension as dependent variable.

Participants

The participants of the study consisted of 15 English major students who were studying in the first year of their undergraduate programs in the academic year of 1/ 2020, Faculty of Humanities and Social Sciences, Nakhon Sawan Rajabhat University, Thailand. All students were studying the same course of Basic English Reading. They were selected with a convenience sampling method.

Innovation

Throughout the five-week period, two infographics were integrated into instruction practices to support reading activities, learning motivation and engagement.

1. *Padlet walls* or online virtual bulletin boards available on *www.padlet.com* were used for identifying key ideas from reading texts.

2. *Canva*, a free graphic design platform, used to create social media graphics, presentations, posters, documents and other visual content available on www.canva.com. This tool was selected for the students to design and create their own infographics in order to present what they had learned from the assigned reading texts in a creative and motivating way.

Pedagogical Intervention

First, the researcher explained about purposes of the research, content of the lesson, vocabulary and grammar structures, the materials related to KWL-Plus Strategy (Carr & Ogle, 1987) as well as training them how to design or create individual infographics related to reading comprehension topics. The researcher took reading materials from Reading Power books and websites *www.dreamreader.net* and *https://learnenglish.britishcouncil.org/.* The pedagogical intervention was described in three phrases as follows:

Phrases I: Pre-test

Teacher gave the multiple-choice test that the teacher had prepared in order to examine students reading comprehension ability.

Phase II: Treatment

The implement of reading comprehension instruction through KWL-Plus strategy was divided into three stages:

Pre-reading

1. Students were assigned to brainstorm the topic given and they were asked to conduct the questions: *"what do we already know about the topic?"*

2. Students were assigned to create the KWL-Plus chart through infographics (Padlet and Canva).

3. Students brainstormed words, that associate with a topic, and recorded them in K column.

4. Students arranged some questions to find out about the topic.

5. Students were asked to share what they knew with the class. They could add new information from their peers to their own column.

While-reading

6. Students reread the text by looking for clues. They were assigned to read the text given. Then, the students found out the answers according to the questions in the pre-reading stage.

Post-reading

7. Students were assigned to note down the knowledge they obtained. They discussed and answered questions, their answer will be recorded in W and L column.

8. Students were assigned to summarize the texts into Plus column.

Phase III: Post-test

Teacher gave the post-test to each student by giving the same reading test.

Data Collection Procedure

This study was a one-group pre-test post-test design. To answer the above mentioned of two research questions, the data collection procedure was as follows:

To respond to the researcher question 1; the participants were asked to do a pre-test regarding reading comprehension skills. The duration of the experiment was a five-week period for a 120-minute session. Immediately following the five-week of instruction, the participants completed a post-test with the same tasks as the pre-test, which consisted of 30 items of reading passages. The items were all based on multiple-choice format with four options. All parts were based on multiple-choice format with four options (a, b, c, d). The scores of the two tests were evaluated by the researcher.

The data collected to answer research question 2 was opened-ended questions form. The participants were requested to complete open-ended questions to express their opinions about the use of KWL-Plus metacognitive reading strategy through infographics. The questions were in Thai so that the participants could understand the questions, and they answered the open-ended questions in Thai.

Data Analysis

To respond to the first objective which aimed to investigate how the KWL-Plus technique significantly improve the students reading comprehension skills. In order to analyze the data, a paired test sample t-test was statistically conducted to determine the differences between the pre test and post test scores.

To respond to the second objective which focus on exploring students' views towards using KWL-Plus strategy through infographics to enhance students' reading comprehension skills, the open-ended questions were analyzed quantitatively using content analysis.

Results

The results are divided into two parts according to the research questions. The first part shows the effects of using KWL-Plus strategy through infographics on Thai EFL students' reading comprehension skills. The second part presents the students opinions towards using KWL-Plus strategy through infographics to enhance students' reading comprehension skills.

To start with, the mean scores of the pre-test and post-test of the participants were compared using a paired t-test in order to investigate how the KWL-Plus technique significantly improves the students' reading comprehension skills. The analysis of the paired t-test calculated on the mean scores of the pre-test and post-test showed that the use of KWL-Plus as an instructional reading strategy has a significantly affected on the reading comprehension of first-year English major students. The results obtained are showed in the table 1 and table 2.

Table 1: Paired Sample Statistic of overall mean scores

	Mean	N	Std. Deviation
Pair 1 Pre-test	16.93	15	2.28
Post-test	21.07	15	2.22

Table 2: Paired Sample Test

		Paired Differences						
		Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Sig. (1-tailed)
Pair 1	**Pre - Post**	5.87	2.67	0.69	8.5130	14	0.0000	0.0000

The result from table 1 showed that the mean scores of the participants increased from 16.93 (SD = 2.28) in the pre-test to 21.07 (SD = 2.22) in the post-test by approximately 5 points.

In this case, the p-value which was .000 was less than .05, so this implied that the students' post-test scores after using KWL-Plus reading strategy were higher than the pre-test scores at a significant level of .05. It could be concluded that there were significant differences between the mean scores of pre-test and post-test at a significant level ($p<.05$). Consequently, students' reading comprehension skills were significantly enhanced after using KWL-Plus as instructional material.

In addition, in order to elicit students' attitudes towards the use of KWL-Plus strategy through infographics as part of their reading process clearly, the students were asked to share their attitudes through open-ended questions. The analysis of students' open-ended questions revealed that infographics can help students develop their reading comprehension skills. Most of students expressed their opinions that infographic made English reading easier, and that they became more motivated to read English texts. The frequent keywords expressed were "interesting", "challenging", "easy to understand" and "not boring" Some another keyword were "fun reading", "creative tools", and "beautiful graphics". The following extract shows how the students explained in their own words what they had experienced in the assigned reading activities:

> *"Before I learned KWL, I read without focus. After I learn to use KWL-Plus, I can pay more attention to my reading. I can focus on questions while I am reading."* (S01)
>
> *"KWL-Plus and Infographics help me understand reading texts better."* (S04)
>
> *"I'm so happy to know KWL-Plus and it's very interesting to apply KWL with infographics."* (S05)
>
> *"Infographics activities are very interesting, such as Padlet. It also helps me to scope my ideas from the reading."* (S12)

In the above extract, students stated that infographic reading assignment could motivate them to read and help them understand English texts easily when they applied with KWL-Plus strategy. One student also shared a similar viewpoint by stating that infographics reading activities interested her and helped her to scope ideas from the reading.

It was also found out that throughout the period of the technology-based instructions, the students experienced classroom learning through infographics that was different from traditional teaching methods. They also had fun with the classroom atmosphere as we can see from the extract below:

> *"I think this strategy is better than the traditional method of teaching reading."* (S07)
>
> *"I like the technology-based classroom more than the general class because it's not boring."* (S09)
>
> *"I like this classroom, and I had fun with online tools."* (S10)

The students' view toward the infographics: Padlet and Canva, in terms of advantages to the implementation of those tools in the classroom are presented as follows:

> *"Summarize the text through Padlet and Canva is a good way to learn reading actively."* (S02)
>
> *"I like Padlet because it is easy and convenience to post."* (S9)
>
> *"Padlet is a convenience online board to show my products on the wall."* (S15)

However, there were some factors affecting learning, including the usefulness of personal computers, Internet Connection, inconvenience of technology-integrated learning, unfamiliar online tools, and the limitations of vocabulary. The extract below illustrates their opinions:

"I always have Internet connection problems while using infographics, it takes a long time to access." (S03)

"It's interesting but I'm not familiar with Padlet and Canva." (S08)

"There are some words that I don't know the meaning, so it's quite hard to understand the texts." (S13)

"I don't have a personal computer, so I think it's not convenience to create infographics via mobile phone." (S14)

Discussion

The purpose of this study is to investigate how the KWL-Plus technique significantly improve the students reading comprehension skills. More specifically, following the KWL-Plus strategy, the researcher also aims to explore students' views towards using KWL-Plus strategy through infographics to enhance students' reading comprehension skills. The main findings of this study include;

According to the statistical results, the score of pre-test and post-test could be an evidence of students' improvement. Students' reading comprehension skills was significantly different in their mean scores ($p < 0.001$) after learning through KWL-Plus strategy. The scores of students' post-test ($M = 21.07$) was higher than the score of the students' pre-test ($M = 16.93$). After the researcher conducted the experimental study, it was found that the results of the students' reading comprehension had shown significant improvement. KWL-Plus strategy could improve students' reading ability in order to comprehend reading passages.

Analysis of data collected from the open-ended questions indicated that all participants agreed that they had improved their reading comprehension skills using KWL-plus through infographics. The content analysis of information obtained from the open-ended questions that probed real feeling from the students. For example: Q2. How did you feel about integrating KWL-Plus with the infographics? Students reported that they had positive attitude towards the use of KWL-Plus strategy through infographics to enhance students' reading comprehension skills because KWL-Plus helped to elicit their prior knowledge and motivated them to read English texts effectively and actively. At the same time, infographics (Padlet and Canva) were used as classroom supportive tools that increase student motivation to read. Students also believed that they understood English passages better after they performed KWL-Plus strategy. However, the major drawbacks that could hinder student performance

were the Internet signal failure, inconvenience of a personal computer, unfamiliar infographics, and the limitations of vocabulary and grammar structures.

Conclusion

To summarize, the main aims of the present study were to investigate the effects of using KWL-Plus strategy through infographics on Thai EFL students' reading comprehension skills. The participants of the study consisted of 15 English major students who studied in the first year of their undergraduate programs, by using convenience sampling, enrolled in Basic English Reading in the academic year of 1/ 2020. This study was a one-group pre-test post-test design. The duration of the experiment was a five-week period for a 120-minute session. The results showed that the mean scores of the participants after they performed the KWL-Plus strategy through infographics on reading comprehension were higher than the pre-test scores. This indicated that students' reading comprehension skills get improved after they received an instruction using the KWL-Plus through infographics on reading assignments. Students also highlighted the efficacy of the KWL-Plus reading strategy using infographics, which create a teaching and learning environment that makes learning convenient, fascinating, motivating, and engaging.

Lastly, it is evident that the use of KWL-plus strategy through infographics can be advantageous to classroom teaching and learning especially in the reading class. Therefore, integrating appropriate teaching strategy and online tools to encourage and motivate reading English is advisable. The researcher hopes that this research study will be beneficial for English Language teachers who interested in KWL-Plus technique in order to raise students' confidence towards reading assignments and help them improve their reading ability through the use of online tools of the 21st century.

Pedagogical Implications

Pedagogical implications were drawn from the research findings and discussion. They are summarized as follows:

First, from the findings in the present study, it becomes apparent that KWL-Plus strategy is incredibly helpful to promote students' reading ability effectively. Consequently, English teachers should include KWL-Plus strategy in teaching reading. Second, according to the results of the study, students have positive satisfaction on KWL-Plus strategy because it helps to promote students' reading ability in reading comprehension. It is suggested that teacher should provide different types of reading passages in other levels. Finally, to implement the use of infographic assignments and to improve students' reading comprehension successfully, students require some development of vocabulary knowledge and basic grammar structures in order to avoid spending too much time figuring out how to

start the classroom assignments. In terms of information communications technology (ICT) skills, since some students are not familiar with infographic applications, the teacher should provide training course to the students in order to increase students' confidence to employ different infographics to benefit their learning outcomes.

Limitations and recommendations

The KWL-Plus strategy instruction using infographics on students' reading comprehension skills of Thai EFL undergraduate students can be further investigated in the future according to these given recommendations:

First, similar study could be conducted to explored the effects of the treatment on reading comprehension skills and opinions of students in different background settings such as proficiency levels, regions, or nationalities. New learning strategies and activities regarding reading competence can be further investigated and employed in the instructional design.

Second, this study was carried out over a five-week period only. It would be better to have a longer period in order to see different findings. Moreover, this study employed one-group pre-test post-test design to investigate the effects of using KWL-Plus strategy on students' reading comprehension skills. Further study may add a comparison group to strengthen the design of the study. Additionally, because of time limitation to conduct this research, the instrument had not been pilot and inter-rater reliability had not been calculated. Another limitation was the findings of this study were limited to the data obtained from fifteen English major students, and because of the small sample size and the fact that there was no normal distribution. Technical matters also needed to be taken into consideration because the infographics were developed on each website. In some cases, the internet connection did not work efficiently. Both teacher and students were forced to spend more time than expected in the development of the infographics. Lastly, students needed to be trained about how to use different infographics, the appropriate use and the meaning of infographics at the very beginning.

Due to the limitations of this study, future studies should be focused on a longer period or conducted with non-English major students in order to increase generalizability of the results and to yield more comprehensive findings. Furthermore, this study employed only open-ended questions. Conducting more on questionnaires and focus group interviews could be another alternative worth considering. The researcher adapted KWL-Plus strategy from Carr and Ogle (1987) to develop students' reading comprehension ability, it is recommended that future studies use another approach or extend your KWL reading strategy with other language skills (e.g., speaking and writing). Finally, the researcher would like to contribute this technique and innovation to other teachers by organizing a group

of innovation for teachers via online applications. In doing so, this would be beneficial for teachers to exchange opinions. Then, training them how to apply the KWL strategy and infographics in language classrooms might be another effective teaching strategy for improving students' metacognitive skills.

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