A Metacognitive-Based Analysis of Online Reading Strategies among Thai EFL Undergraduate Students

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การอ่านออนไลน์เป็นองค์ประกอบที่สำคัญประการหนึ่งที่ช่วยให้นักศึกษาไทยเข้าถึงแหล่งข้อมูลเพื่อวัตถุประสงค์ต่างๆ นับตั้งแต่การค้นหาข้อมูลเชิงวิชาการจนถึงการอ่านเพื่อความเพลิดเพลิน การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อสำรวจการใช้ยุทธวิธีการอ่านเชิงอภิปัญญาของนักศึกษาไทยทั้งกลุ่มวิชาเอกภาษาอังกฤษและกลุ่มวิชาเอกอื่นๆ ในขณะอ่านเนื้อเรื่องภาษาอังกฤษออนไลน์ ข้อมูลวิจัยมาจากสองแหล่งหลัก คือ ผลสำรวจความคิดเห็นของนักศึกษาระดับปริญญาตรีที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศจำนวน 80 คน และผลการสังเกตนักศึกษาที่เข้าร่วมกิจกรรมการบอกกระบวนการความคิดจำนวน 8 คน ผลการศึกษาพบทั้งความคล้ายคลึงและความแตกต่างระหว่างนักศึกษาทั้งสองกลุ่มในการใช้ยุทธวิธี แนวทางการสอนและข้อเสนอแนะสำหรับการศึกษาวิจัยรวมอยู่ในส่วนสรุปของบทความวิจัยนี้

Abstract

Online reading has become an important element of Thai students' capacity to access information for several reasons, ranging from getting information for academic purposes to reading for pleasure. The purpose of this paper is to explore how Thai college students who are both English majors and non-English majors utilize metacognitive online reading strategies while reading English online texts. Data come from two major sources: a survey response of 80 undergraduate Thai EFL students and think-aloud data of 8 focal students. The results reveal some similarities and differences among the strategies used in the two groups. The paper concludes with a discussion of the pedagogical and research implications of the topic.

Introduction

Online reading has become increasingly important among Thai college students since the growth of the Internet over the last two decades. These students read online for several reasons such as getting information for class assignments, finding information about topics of interest, communicating with family members and friends, and just for entertaining themselves. However, based on several years of teaching experience, the researchers observed that quite a number of students did not plan in advance how they were going to get information from a webpage. For instance, they usually began reading the text presented on a page without skimming it to get a basic idea of whether it would serve their purpose. As a result, they sometimes found that a text they had read carefully turned out to be irrelevant to their topic. However, students who had more experiences and hours of learning English such as those who were majoring English seemed to do well when they employed some types of metacognitive reading strategies to help them get relevant information from online reading. Because of these observations, the researchers want to conduct a study to explore how Thai college students who are both English majors and non-English majors employ metacognitive online reading strategies which include planning, monitoring and evaluating when reading English texts online. The research questions are as follows:

1) What metacognitive online reading strategies are reported as being used by Thai college students among English majors and non-English majors?

2) During think-aloud sessions, to what extent do students employ metacognitive online reading strategies that they previously reported as being used?

The current study is aimed to explore not only what strategies are used but also how the students make use of the strategies in reading online texts. This will facilitate teachers in equipping students with a repertoire of strategies that are effective for their online reading process.

Literature Review

Metacognitive Reading Strategies

In a first language, a person receives primary linguistic input via listening. Foreign language learners, however, are exposed to a language other than their first via

reading. As a result, reading is considered a primary and essential skill for a person who is mastering a new language. This is especially true in the academic world, where it is very rare that EFL students can succeed without having effective reading skills.

Therefore, reading researchers and educators have been actively searching for strategies to help learners acquire strong reading skills. They no longer consider reading as a passive way of getting information, but as an active process of constructing understanding (e.g. Schramm, 2008). Furthermore, a growing body of research has revealed strategies that are used by good readers and has catalogued those strategies into three processes: before, during, and after reading. Before reading, good readers are clear about their goal in reading the text; for instance, they know that they read to find a specific piece of information or to recall the information for a test. Good readers skim the text in advance to see whether the text is relevant to their goal or contains information they want to find. Good readers also activate prior knowledge before reading the text, which will help with comprehension during reading. During reading, good readers not only use their cognitive strategies such as memorizing, inferencing, summarizing, analyzing, or using context clue, but also utilize monitoring metacognitive strategies such as rereading, underlining, paraphrasing, and stopping to see if the text is relevant to their goal. After reading, skilled readers summarize and reflect on what they have just read. Often, they evaluate the reliability of the text (Pressley, 2002).

Metacognition can be defined as thinking about the learning process as it is taking place, monitoring one's production or comprehension, and evaluating learning after an activity is completed (Hismanoglu, 2000). Anderson (2003) believes metacognitive strategies play the most vital role in language learning because they help learners understand how to regulate their own learning through the use of strategies; this tactic should help expedite language acquisition.

Anderson (2003, p.10) divides metacognitive reading strategies into five components: (1) “Preparing and planning for effective reading,” which means taking time to prepare for reading and planning what needs to be accomplished. For instance, a reader takes time to activate prior knowledge before he/she starts reading. (2) “Deciding when to use particular reading strategies” involves selecting appropriate strategies to aid one’s reading. For example, a student decides to look up words in a dictionary or to consult a more advanced reader. (3) “Knowing how to monitor reading strategy use” is a

learner's ability to recognize when he/she does not understand, and then stop to do something about it. (4) "Learning how to orchestrate various reading strategies" is the ability to integrate various strategies in a positive way. It is believed that using a combination of strategies is much more effective than only relying on one isolated strategy. (5) "Evaluating reading strategy use" is a reader's ability to assess the effectiveness and efficiency of what he/she is doing.

Metacognitive strategies, in addition, can assist readers in being able to critically think about their own reading; this could result in making changes in how they manage and improve their reading performance. O'Malley and Chamot stated that "students without metacognitive approaches are essentially learners without direction [who lack the] opportunity to plan their learning, monitor their progress, or review their accomplishments and future learning directions" (as cited in Anderson, 2003, p. 99).

Online Reading Strategies Research

Web-based reading is different from paper-based reading and may cause great difficulties to readers, as one webpage may contain many components. A typical webpage layout consists of the corner, the banner, the sidebar, the body, the menu and links to multimedia or other websites. It is likely that reading online is more complicated and difficult, as it provides new text formats, new purposes for reading, and new ways to interact with information that can confuse and overwhelm students who are taught to extract meaning via print-based reading (Coiro, 2003). However, online reading has become a significant source of input for EFL readers; hence, it is essential for them to be equipped with strategies in order to be effective readers who are literate in this new environment of online reading.

It is also crucial to be aware that some metacognitive strategies may be more important for online reading, as there are some differences between online and paper-based reading environments. Coiro & Dobler (2007) conducted a study to explore the nature of online reading comprehension processes. The results of the study suggested that successful Internet reading experiences appeared to simultaneously require both similar and more complex applications of: (1) prior knowledge sources, (2) inferential reasoning strategies, and (3) self-regulated reading processes. In addition, Chang (2005) examined the effects of self-monitoring strategies to facilitate learning in an online

environment, and found that self-monitoring strategies contributed to academic achievement and motivational beliefs among both more proficient and less proficient learners in an online learning environment. As the two studies revealed, activating prior knowledge, which is under "preparing and planning for effective reading," and self-monitoring, which is under "knowing how to monitor reading strategy use," appear to be important metacognitive strategies for online reading.

In a Thai context, to date, very few studies have been conducted to investigate metacognitive online reading strategies used by Thai students, one of which was a study conducted to explore metacognitive online reading strategies among EFL university students in four countries (Pookcharoen, S., In, V., Lee, Y., & Kigamwa, J., 2009). Pookcharoen et al. (2009) administered an online survey to 132 students from Cambodia, Kenya, Korea and Thailand; two students from each country were selected for a think-aloud reading task. The present study builds on this research vein, and it offers an additional contribution in that it is intended to help shed light on whether Thai college students with English majors and non-English majors use the same metacognitive reading strategies when reading online.

Theoretical Framework

A New Literacies Perspective

In an attempt to capture the nature of online literacy, many researchers have begun to use the terms *new literacies*, which means many different things to many different people. The various definitions of new literacies range from social practices (Street, 1999) or new Discourses (Gee, 2003) that emerge with new technologies, to new semiotic or cultural contexts made possible by new technologies (Kress, 2004; Lemke, 2002). While multiple perspectives associated with the term *new literacies* differ from one another, the most recent review (Coiro, Knobel, Lankshear, & Leu, 2008) concludes that most share a set of common assumptions: (1) new literacies include the new skills, strategies, dispositions, and social practices that are required by new technologies to obtain information and to engage in communication; (2) new literacies are central to full participation in a global community; (3) new literacies regularly change as their defining technologies change; and (4) new literacies are multifaceted and our understanding of them benefits from their exploration from multiple points of view.

For this paper, the researchers would like to conceptualize this piece of work within a new literacies theory of online reading comprehension (Castek, Leu, Coiro, Gort, Henry, & Lima, 2008; Leu, Kinzer, Coiro, & Cammack, 2004). More specifically, to enrich understanding of online reading, we subscribe to the theoretical work which argues that the nature of literacy is rapidly changing as new technologies emerge (Alexander & Jetton, 2000; Lankshear & Knobel, 2003). Within this perspective, Leu et al. (2004) identify five practices that take place during the online reading process: (1) identifying important questions; (2) locating information; (3) critically evaluating information; (4) synthesizing information; and (5) communicating information. Further, they posit that while the aforementioned skills appear to overlap with offline reading practices, traditional reading skills are not sufficient to comprehend online information available on the Internet.

Methodology

Participants

Based on purposeful sampling, 80 undergraduate students were recruited from a university in Thailand. They were between 18 and 23 years old. The participants were divided into two groups of 40. Group One was comprised of English majors and Group Two was comprised of several majors excluding English. The English major group consisted of 4 male and 36 female students, while the non-English major group consisted of 11 male and 29 female students. Table 1 shows the participants' years of studying English by group:

Table 1 Participants' years of studying English by group

	1-5 years	6-10 years	11-15 years	16-20 years	21-25 years
English	0	3	20	15	2
Non-English	1	2	19	18	0

All participants were taking an English course in the English Department of Thammasat University as either a required or elective course when the researchers contacted them to participate in this study. Rather than assuming that the English major students had higher proficiency than the non-English major students, the current study

intends to explore how their different levels of exposure to the English language through formal instruction affect their actual use of strategies.

After all the participants completed a survey, four from each group were selected to engage in a think-aloud task based on their willingness and readiness to do so, such as having an access to computer and the Internet. All participants in the English major group were female. They all spent one to two hours per day reading online, except Eng 2 who spent less than one hour a day. The non-English major group was comprised of two males and two females. Non-Eng 1 was a female majoring in Journalism and Mass Communications. She reported that she spent less than one hour a day reading online. Non-Eng 2 was a female majoring in Political Science (International Relations) while Non-Eng 3 and 4 were males majoring in French and Linguistics, respectively. Non-Eng 2, 3 and 4 spent one to two hours a day reading online.

Data Collection

The researchers created a questionnaire through an online survey tool called Survey Monkey and sent out a link to the questionnaire to participants via e-mail. The questionnaire consisted of ten items, nine of which were demographic questions, and one of which was an 38-item Online Survey Of Reading Strategies (OSORS) (Anderson, 2003) (See Table 2). The OSORS was developed by Anderson to measure metacognitive online reading strategies and was an adapted form of the Survey of Reading Strategies (SORS) (Sheorey and Mokhtari, 2001 cited in Anderson, 2003) which was used to measure offline reading strategies. The OSORS contained three sub-categories: global, problem-solving and support strategies. Concerning its reliability, the reported Cronbach's alpha for the overall OSORS was .92 (Anderson, 2003).

The researchers sent out a link to the questionnaire to a total of 200 students, and received 88 responses back, which comprises a 44% response rate. Of the total responses, forty of them were from English majors and forty-eight were from non-English majors. The last eight responses from non-English majors were discarded so as to leave the two groups with the same number of participants.

The purposes of the survey include the following: collecting data on what metacognitive online reading strategies the two groups of students reported using; seeing which strategies the two groups used most often while reading online; and examining whether the two groups used the strategies differently from one another.

After analyzing the data from 80 responses, the researchers randomly selected eight participants for a think-aloud session. The participants were informed that: 1) their participation was voluntary; 2) they would be interviewed via either Skype or MSN, so they should have an access to a computer and the Internet; 3) their conversations with the researchers would be recorded using either Pamela for Skype or MSN Recorder Max; and 4) they would have a chance to review their Thai transcript of the interview before the researchers proceeded with using their data.

During the think-aloud task, the eight participants were asked to read information about technology from *New Scientist* (http://www.newscientist.com/section/tech). This website was selected because it seemed to allow the researchers to investigate the strategies the participants reported using and the researchers thought the topic, technology, should be of interest to the students. Before the actual think-aloud task, they were also told how a think-aloud should be done by using another website, *CNN.com/technology* (http://www.cnn.com/TECH/) which had a similar format to *New Scientist*. The texts in both websites were measured for their readability statistics and they received Flesch-kincaid grade level scores in the range of 12.5- 14.7 which means that the text is expected to be understandable by an average student in the 12th grade and university students in the U.S. (Flesch–Kincaid readability test, n.d.). In order to ensure validity and inter-rater reliability, a guideline for the think-aloud task which was developed by Pookcharoen et al. (2009) was adapted to be used in this study. Thai was used as the language for the interviews since the students felt more comfortable with it.

The purposes of the think-aloud sessions were to understand whether the results of the survey matched each group of students' self-reported metacognitive online reading strategies, and to ascertain to what extent the students employed strategies that were reported as being used. In addition, the researchers hoped to use the think-aloud sessions to probe into the students' minds so as to better understand what strategies they actually employed, as well as the reasons why they employed such strategies.

Data Analysis

To obtain a general idea about the whole group, the researchers identified the mean scores and standard deviations of all strategies, and the top three strategies reported being used by the overall students in the three sub-sections of the OSORS: global, problem-solving and support strategies (See Table 3). To answer the first research question, the top three strategies used by each group in the three sub-sections were identified, and a t-test was applied to examine whether the two groups' mean scores differed significantly. For this study, the level of significance was set at $p \leq .05$. To answer the second research question, the researchers first identified the most frequently-used strategies in each sub-section—that is, the ones the students marked as *usually* and *always* in the questionnaire. Then, the researchers analyzed the recordings of the think-aloud conversations to see if the students' actual usage of strategies in the think-aloud sessions matched those reported in the questionnaire. The actual strategies used by students during their think-aloud session are presented in Table 5.

Results and Discussions

Answer to the First Research Question:

What metacognitive online reading strategies are reported as being used among Thai college students both majoring in English and majoring in other fields?

The first research question in this study was directed towards identifying the metacognitive online reading strategies used by Thai college students who were both English and non English majors. In the survey, the students were asked to complete the 38-item OSORS. The OSORS was categorized into three sub-sections, as shown in Table 2 below (Anderson, 2003).

Table 2 The three subsections of the OSORS

Global Reading Strategies
1. I have a purpose in mind when I read online.
2. I participate in live chats with other learners of English.
3. I participate in live chats with native speakers of English.
5. I think about what I know to help me understand what I read online.

6. I take an overall view of the online text to see what it is about before reading it.
8. I think about whether the content of the online text fits my reading purposes before choosing to read it.
10. I review the online text by first noting its characteristics like length and organization.
14. When reading online, I decide what to read closely and what to ignore.
17. I read pages on the Internet for academic purposes.
18. I use tables, figures, and pictures in the online text to increase my understanding.
20. I use context clues to help me better understand what I am reading online.
23. I use typographical features like bold face and italics to identify key information.
24. I critically analyze and evaluate the information presented in online texts.
26. I check my understanding when I come across new information.
27. I try to guess what the content of the online text is about when I read.
30. I check to see if my guesses about the online text are right or wrong.
32. I scan the online text to get a basic idea of whether it will serve my purposes before I choose to read it.
33. I read pages on the Internet for fun.

Problem Solving Strategies

9. I read slowly and carefully to make sure I understand what I am reading online.
11. I try to get back on track when I lose concentration.
13. I adjust my reading speed according to what I am reading online.
16. When an online text becomes difficult, I pay closer attention to what I am reading.
19. I stop from time to time and think about what I am reading online.
22. I try to picture or visualize information to help myself remember what I have read online.
28. When an online text becomes difficult, I re-read it to increase my understanding.
31. When I read online, I guess the meaning of unknown words or phrases.
34. I critically evaluate the online text before choosing to use information I read online.
35. I can distinguish between fact and opinion in online texts.
36. When reading online, I look for sites that cover both sides of an issue.

Support Reading Strategies

4. I take notes while reading online to help me understand what I read.
7. When an online text becomes difficult, I read aloud to help me understand what I read.
12. I print out a hard copy of the online text then underline or circle information to help me remember it.
15. I use reference materials (e.g. an online dictionary) to help me understand what I read online.
21. I paraphrase (restate ideas in my own words) to better understand what I read online.
25. I go back and forth in the online text to find relationships among ideas in it.
29. I ask myself questions I would like to have answered in the online text as I read it.
37. When reading online, I translate from English into my native language.
38. When reading online, I think about information in both English and my mother tongue.

All of the students in the overall group reported that they used problem-solving strategies the most ($\overline{X}$ = 3.47), global strategies second most frequently ($\overline{X}$ = 3.34) and support strategies the least ($\overline{X}$ = 2.89). Table 3 shows the means and standard deviations for the three sub-sections of the OSORS of the eighty students.

Table 3 Mean and Standard Deviation for the three subsections of OSORS

	N	Minimum	Maximum	$\overline{X}$	SD
Global	80	1.06	4.61	3.3372	.58092
Problem Solving	80	1.00	4.82	3.4731	.62534
Support	80	1.11	4.44	2.8948	.58410

In addition, the students in the overall group reported that their most frequently used strategies under global strategies were nos. 33, 6 and 20, under problem-solving strategies were strategies nos. 31, 28 and 22 and under support strategies were strategies nos. 21, 15 and 38. Strategy no. 33 *read for fun* received the highest mean ($\overline{X}$ = 3.90). A total of 73.4% of the overall students answered "*4" usually* and "*5" always* to the question, "I read pages on the Internet for fun." This reflected that this group of students probably read a substantial amount of non-academic websites, which was a positive indication for EFL reading, since voluntary reading could promote reading

proficiency. Moreover, this finding resonated with the fact that some entertainment websites (e.g. www.sanook.com or www.kapook.com), where website surfers could check out their horoscopes, read celebrity news, download ringtones for their cell phones, download emoticons, shop online, etc., were very popular among Thai teens. Many participants in this study indicated that they read similar websites to sanook.com or kapook.com in English as well.

Strategy no. 31, "When I read online, I guess the meaning of unknown words or phrases" also garnered a relatively high mean ($\overline{X}$ = 3.80). A total of 67.5% of the overall students answered "*4" usually* and "*5" always* to the question, "When I read online, I guess the meaning of unknown words or phrases." This finding revealed that an instructional effect also played a role in students' usage of strategies and that offline reading strategies could be transferred to online reading. Most students in this study have taken a reading course entitled, "Reading for Information" whose first chapter focused on teaching reading strategies; one of these techniques was "guessing an unknown word." Apparently, the students seemed to apply offline reading strategies they learned from the class "Reading for Information" to their online reading. Table 4 displays the top three strategies in each of the survey areas reported as being used by the overall group of students.

Table 4 Top-three strategies reported as being used by the overall students

Strategy Type	N	Strategy Number	$\overline{X}$	SD
Global	79	(33) *read for fun*	3.90	1.045
	79	(6) *overview before*	3.81	0.907
	80	(20) *use context clues*	3.78	0.981
Problem-solving	80	(31) *guess unknown words*	3.80	0.863
	80	(28) *re-read*	3.75	1.037
	80	(22) *visualize*	3.68	0.978
Support	80	(21) *paraphrase*	3.44	1.089
	80	(15) *use reference/dictionary*	3.35	1.202
	79	(38) *think bilingual*	3.15	1.039

The mean values of the strategies most frequently reported using range from 3.90 to 3.15 with an average of 3.71. Interestingly, the strategy that the overall group of

students reported using the least was strategy no.4, *take notes* under support strategies. That is to say, a total of 82.2% of the students answered "*1" never or almost never* and "*2" only occasionally* to the question, "I take notes while reading online to help me understand what I read." The main reason could be that most participants in this study read online for fun; therefore, taking notes was not necessary.

With regard to the strategies used most by students in English and non-English majors, their mean scores and standard deviations are displayed in Table 5. Although the differences between the means of the two groups concerning the average score for each of the three survey areas were not statistically significant at the .05 level (Sig. (2-tailed) global = .075, problem-solving =.134 and support =.666), the results in Table 5 revealed that these two groups both shared and differed in the particular metacognitive online reading strategies they tended to use under the three different dimensions. For instance, while two out of three global strategies the English major group reported using; namely, no. 14 *read or ignore* and no. 20 *use context clues* are under "Deciding when to use particular reading strategies", the non-English major group reported using strategies no. 6 *overview before* and no. 32 *scan text* which are classified under "Preparing and planning for effective reading."

Furthermore, the English major group tended to include the strategy that helped them to improve their linguistic accuracy, i.e. strategy no. 15 *use dictionary,* as their top strategy, whereas the non-English group did not. This could come from the fact that the English major students are being exposed to the language in an academic sense much more than the other majors. They remain very focused on accuracy of use and characteristics specific to the English language.

Table 5 The top three strategies reported as being used by each group

Strategy Type	English major				Non-English major			
	Strategy no.	N	$\bar{X}$	SD	Strategy no.	N	$\bar{X}$	SD
Global	33 *read for fun*	39	3.92	0.839	6 *overview before*	40	3.88	0.939
	14 *read or ignore*	40	3.88	0.966	33 *read for fun*	40	3.87	1.223
	20 *use context clues*	40	3.80	0.966	32 *scan text*	40	3.72	0.916

Table 5 (continue) The top three strategies reported as being used by each group

Strategy Type	English major				Non-English major			
	Strategy no.	N	$\bar{X}$	SD	Strategy no.	N	$\bar{X}$	SD
Problem-solving	31 *guess unknown word*	40	3.88	0.939	28 *re-read*	40	3.78	1.074
	22 *visualize*	40	3.75	1.006	31 *guess unknown words*	40	3.72	0.784
	34 *evaluate info*	40	3.73	1.154	11 *get back on track*	40	3.70	0.853
Support	15 *use dictionary*	40	3.70	1.137	21 *paraphrase*	40	3.48	0.978
	21 *paraphrase*	40	3.40	1.194	38 *think bilingual*	39	3.10	1.095
	38 *think bilingual*	40	3.20	0.992	25 *find relationships among ideas*	40	3.10	1.128

To sum up, eighty participants in this study reported that they used the strategies in the problem-solving component the most, followed by the global and support components. When looking into the strategies used most by students from English and non-English majors, it is found that the differences between the means of the two groups in the average score for each of the three survey areas were not statistically significant at the .05 level. However, when we looked into a more detailed analysis of these differences, these two groups both shared and differed in the particular metacognitive online reading strategies they tended to use under the three different components. Some differences include the fact that the English major group employed strategies that helped them improve their linguistic accuracy i.e. strategy no. 15 *use dictionary,* as their top strategy in the support strategies component; by contrast, the non-English major group did not. This could come from the fact that English majors tended to focus on accurately using the English language in accordance with its distinctive characteristics, a practice which was deemed as being very important to them.

Answer to the Second Research Question:

During the think-aloud sessions, to what extent do students employ metacognitive online reading strategies that were previously reported as being used?

The second research question in this study was directed towards uncovering the extent to which students utilized metacognitive online reading strategies that were reported as being used in the survey responses. Through the think-aloud protocol, the researchers found that the eight students used approximately 74% of the strategies that they actually reported using. Table 6 displays the percentages of the strategies used by the eight students in the think-aloud sessions.

Among the 38 strategies, strategies no. 27 *guess content of the text* and no. 31 *guess unknown words* were found to be reported in the survey as being used most frequently by seven participants; these strategies were also observed as being used by the seven participants in the think aloud sessions as well.

Table 6 Percentages of strategies used by students in the think-aloud

Student	**Global**	**Problem solving**	**Support**	**Overall**
Eng 1	4/8=50%	5/9=56%	1/1=100%	10/18=56%
Eng 2	8/12 =67%	3/4 =75%	1/1=100%	12/17 =71%
Eng 3	11/14 =79%	5/7 =71%	2/3 =67%	18/24 =75%
Eng 4	5/6 = 83%	4/5=80%	2/3=67%	11/14=79%
Overall Eng	**28/40 =70%**	**17/25 =68%**	**6/8=75%**	**51/73=70%**
Non-Eng 1	7/9 =78%	3/5=60%	3/3=100%	13/17=76%
Non-Eng 2	9/9=100%	4/8=50%	4/5=80%	17/22=77%
Non-Eng 3	7/8 = 88%	7/8=88%	3/4 =75%	17/20 =85%
Non-Eng 4	8/12=67%	8/11=73%	3/3=100%	19/26=73%
Overall Non-Eng	**31/38=82%**	**22/32=69%**	**13/15=87%**	**66/85=78%**

The strategy that was reported to be used the least in the survey by the eight participants was strategy no. 4 *take notes* under support strategies. In fact, none of the eight participants reported using it. Furthermore, the strategy was not observed in the eight think-aloud sessions, either. This finding confirmed the result from the overall students' survey responses.

It is interesting to note that, for these particular two groups, the non-English major group's average amount of strategies reported as being used, as well as their

percentages of actual strategies used in the think-aloud sessions, were slightly higher than the English major group. To be exact, the average percentage of strategies these four non-English major students reported using was 56% (21.3 out of 38 strategies), whereas the four English students reported using 48% of the strategies (18.3 out of 38 strategies). In addition, the percentage of actual strategies used in the think-aloud sessions for the non-English major group was 78% (66 out of 85) but for the English major group, this number was 70% (51 out of 73). These findings could come from the fact that most members in the non-English major group appeared to be proficient English learners. They also seemed to be active learners of English even though they were not academically required to take as many English courses as the English major group. For instance, their hours per day reading online was equivalent to the English major group's and their years studying English were also the same (approximately 16-20 years) as their peers majoring in English.

English major students' strategy use in the think-aloud sessions

In the think-aloud session, 56% of the strategies **Eng 1** reported using were observed. Possessing a good command of English reading, she didn't have much difficulty with the language structures or vocabulary she encountered during reading.

Strategy no. 5 *think about what I know* was used, as she explained "I like this topic of technology. It talks about the use of cell phone and some of its features I am quite familiar with, which makes reading more accessible." It is evident that, before reading the webpage, she spent some time skimming the whole page in order to get an overview of that particular page before paying closer attention to details, which is in line with strategy no. 6. It is interesting to note that while she read the page quite fluently, she made use of its typographical features like bold face and italics to identify key information (strategy no. 23), and this strategy helped her navigate the webpage more efficiently as she reported "Under this section, I should be able to find more information about the use of cell phones in public. So I will skip this part because I already know something about this."

Like many other participants, when faced with unknown words, she either guessed meanings from the contexts (strategy no. 31) or she used an online dictionary to determine word meanings (strategy no. 15). She tried not to consult a dictionary very

often as it, as she suggested, took much time in order to grasp the right meaning. However, this particular strategy has proved to be useful when some of the contexts provided were not sufficient to facilitate guesses. She added "I don't know the word "paradigm" here in this sentence, and I think I need to know the word to really understand what it says here." Then, she consulted www.dictionary.com for the word meaning in English. In relation to the use of this strategy, she further elaborated, "Sometimes I determine whether certain words are worth looking up. When contexts help, I don't need to spend time using a dictionary. It's just too time-consuming to use it all the time when you read."

Eng 2 used 71% of the strategies she reported using most frequently in the questionnaire, in which she also self-rated her English language proficiency as good. When undertaking the think-aloud task, she first used strategy no. 6 *overall before* as she explained, "I usually scroll down to the very end of the page to see what it is all about, which helps save a lot of time when I have a lot of things to read. Just like now, I know I am going to learn more about technology." Besides this initial step, she further noted the page's characteristics like length and organization (strategy no. 10). To illustrate the point further, she added "Now, or whenever I really read it, I always see if the organization helps me. I know that the first paragraph is the introduction to cell phone use, and the later ones talk about uses of cell phones in different places. Many of the texts I read are similar to the organization I have been taught in class." Inevitably, she encountered some unfamiliar words that hindered her comprehension. Among several other strategies she used were no. 20 *context clues* and no. 15 *use dictionary*. She articulated her perspective: "I don't use a dictionary very often. It's too time-consuming, so I guess word meanings from contexts. Like this word 'incompatible' which I haven't heard before; I think this sentence means something like this 'the new cell phone charger cannot be used with the existing cell phone." However, during the think-aloud session, she consulted a dictionary from time to time when she couldn't successfully decipher the meanings of some difficult words. She commented, "I want to know the meaning of 'human gait' which says here in this paragraph. I don't think I can use the context like before. Let me just check the meaning from an online dictionary." When further asked about her preferred online dictionary, she replied that *longdo.com,* which is a popular online dictionary among Thai college students, was her favorite.

In addition to these general strategies, she added that, when losing concentration, she needed to stop and think about what she was reading. In some cases, she admitted that she needed to skip several parts of the text because of its difficulty. However, when that happened, she usually read the last two or three paragraphs to get the gist or the conclusion of the text.

Eng 3 employed 75% of the strategies she reported as being mostly used in the questionnaire, where she also self-rated her overall English proficiency as good. Of the fourteen global strategies reported, she used eleven, which were strategies no. 1 *have purpose*, no. 3 *chat with native speakers*, no.6 *overview before*, no. 8 *see if content fits purposes*, no. 14 *read or ignore*, no. 17 *read for academic purposes*, no. 24 *analyze online text*, no. 27 *guess content*, no. 30 *check my guesses*, no.32 *scan text*, and no. 33 *read for fun*. Three strategies under global strategies that were not observed in her think-aloud session were strategies no. 2 *chat with English learners*, no. 18 *use tables, figures, pictures* and no. 23 *use typographical features.* Of the seven problem-solving strategies reported, she used five—namely, no. 11 *get back on track*, no. 16 *paying close attention*, no.31 *guess unknown words*, no. 34 *evaluate info*, and no. 35 *distinguish fact and opinion.* Two strategies under problem-solving that were not used during her think-aloud session were strategies no. 13 *adjust reading speed* and no. 22 *visualize info.* Of the three support strategies reported, she used two, namely, no. 7 *read aloud* and no. 15 *use dictionary*. The student reflected that she did not translate from English to Thai when reading online; therefore, strategy no. 37 *translate from English to a native language* was not identified in the think aloud session although it was reported in her survey response.

The use of *reading aloud* was found in this think-aloud task. Eng 3 utilized it for three purposes: trying to get back on track when she lost concentration, helping her to pay closer attention to what she was reading and helping her understand what she read when the online text became difficult. As Eng 3 appeared to be a confident reader, the facts that she used *reading aloud* to help comprehend the text lent some support to the claim that reading aloud enticed students to become successful readers and help them with literacy development (Bredekamp, Copple, & Neuman, 2000 cited in Gold & Gibson, 2001).

Eng 3 seemed to be a critical reader, as she extensively used strategy no. 34 "*I critically evaluate the on-line text before choosing to use information I read on-line*." She looked at the year publishing text was published to evaluate if the information was current. She also compared the information with other websites to see if it was reliable.

Eng 4 used 79% of the strategies she reported as being mostly used in her survey response. She rated her overall English proficiency as good. Eng 4 reported that she used relatively few strategies under the three subcategories: she reported using six global, five problem-solving and three support strategies; thus, the researcher found some strategies that she used in her think-aloud task that were not reported in her survey response. For example, strategies no. 6 *overview before*, 10 *review online text* and 32 *scan online text* were found to be used before she started reading the text. At the beginning of the think-aloud session, she uttered, "I am scrolling down to see how long the page is, to find titles and subtitles, and to see if it is something I want to read." In addition, strategy no. 34, *evaluate info,* was also identified as being used, even though it was not listed in her often used strategies as reported in her survey response. The student seemed to critically evaluate the online text before she decided to use it by using her own experiences and comparing the information with content from other websites.

Like Eng 3, Eng 4 also utilized *reading aloud* to help her understand what she read. She was in favor of *reading aloud,* as she thought it could help her to improve not only reading comprehension but pronunciation.

Non-English major students' strategy usage in the think-aloud sessions

Non-Eng 1 used 68% of the strategies she reported as falling under the *always* or *usually* frequency of use in her survey response. She rated her overall English proficiency as fair, and mentioned that she had not taken many English courses since she started her major. Strategies no. 10 *review the online text* and no.32 *scan text* were identified at the beginning of her think-aloud session. She first scrolled down to the bottom of the webpage to see its length and organization, and to find a topic of interest when the researcher asked her to start reading the online text about technology. When the text became difficult, Non-Eng 1 employed strategy no. 20 *use context clues.* She uttered, "I don't understand this sentence. I think I will skip it for now. Perhaps I can guess its

meaning when I read the rest of the paragraph." When asked what she thought about the website, she replied,

> Some information is new to me, so I don't really know if it is true. If this were my class assignment, I would double check the information with other sources. The website looks professional. From what I learned from my major, Journalism and Mass Communication, professional websites usually use light colors. Besides, the name of the website contains the word, scientist. That makes it sound reliable and the information presented on the page should be accurate.

Although her comments regarding the website looks professional because it simply used the word *scientist,* and light colors and are not a solid evaluation, the first part of her comments could be considered as being in line with strategies no. 24 *analyze and evaluate the information presented* because she indicated that, normally, for her class assignment, she compares information from websites before using any content. At one point, the student looked up a vocabulary word on a dictionary that was installed in her computer. Therefore, it appeared to be that she also used strategy no. 15 *use dictionary* which matched what she reported in her survey response.

Non-Eng 1 reported that she used strategy no. 28 *re-read when on-line text becomes difficult*; however, this strategy was not observed in the think-aloud session. Instead of re-reading, she stopped and skipped to other links when she did not understand the text. The action was repeated several times. This could happen because of a time constraint. As she had 25 minutes for the think-aloud task, she tried to get as much information as she could by connecting to other links. She could not remain on the same page to re-read the part that she could not comprehend.

Non-Eng 2 appeared to be a confident reader. She rated her overall English proficiency as excellent. Non-Eng 2 employed 77% of the strategies that she reported as falling under *always* or *usually* used as reading strategies in her survey response. Similar to Non-Eng 1, Non-Eng 2 first scrolled down to the bottom of the webpage when asked to read the online text. She vocalized her thoughts by saying that she wanted to see how long the text was, whether it was interesting and responded to her reading objectives, and what the text was about. These were in line with strategies no. 10 *review the online text*

and no.32 *scan text*. She also utilized strategy no. 23 *use typographical features* to help her identify key information in the text. "I usually pay close attention to special fonts because writers often highlight their main ideas using fonts like underlined or italicized…" Additionally, Non-Eng 2 used strategies no. 21 *paraphrase* when she encountered complex sentences. "If a sentence is too difficult, I simplify it on the basis of *who do what*. It helps me understand the sentence better." Strategy no. 34 was also identified as being used, as the student revealed that she usually compared information on the same topic on several different websites.

Of the three OSORS' sub-categories, Non-Eng 2 seemed to use global strategies the most. She received a 100% match between the strategies observed in her think-aloud session and the strategies she reported as being mostly used in her survey response. Interestingly, some other global strategies such as strategy no. 20 *use context clues* were observed, although the student did not report using it in her survey response. However, Non-Eng 2 utilized only 50% of the problem-solving strategies reported as being used in her survey response. For instance, strategies no. 9 *read slowly* and no. 19 *stop from time to time* were not observed. The student confirmed that she read fast and usually read a whole text without stopping.

Using 85% of the overall strategies he reported using when reading online, **Non-Eng 3** appeared to be a very proficient English reader. He demonstrated a very good understanding of how reading strategies can be utilized to enhance comprehension, and that also resulted in his high level of reading proficiency. During the think-aloud session, apart from many basic strategies, he used several advanced strategies such as no. 24 *analyze and evaluate the information presented* and no. 30 *check my guesses.* One of his illustrative examples is as follows:

> The most important thing is that I remind myself of the fact that anyone can post online, so I think I need to check if what I am reading is trustworthy. And frankly speaking, it's not easy to do so. Sometimes I look at the name of the university which the text comes from or the person who creates the text to see how I can trust this person.

In terms of strategy no. 15 *use dictionary*, he offered a very insightful comment: "I like Wikipedia a lot, although I cannot always rely on it. It just gives me a very clear idea

of the topic I want to investigate and, with hyperlinks, I can go from there to learn more." Moreover, he tried to explain how he dealt with difficult words:

> I don't like using a dictionary because it simply interferes with my reading. I usually use context clues to help me understand word meanings. Also, some words have very different definitions. Since it's hard to know which one of them is right, I just depend on the context clue. It also increases my vocabulary repertoire. For example, the word 'demonstrate' in this sentence, I guess from its context that it means to show. Relying on the first definition in a dictionary may lead to a wrong meaning.

Non-Eng 4 used 73% of the strategies he reported as being *always* or *usually* included in the reading strategies he used, as recorded in his survey response. He rated his overall English proficiency as good and appeared to be a proficient reader. He took several English courses throughout his four years in college.

He first started his think-aloud session by taking an overall view of the webpage. Then, he clicked on a medical technology hyperlink and read an article entitled, "Bionic eye cam to shine a light on society." Apparently, he used strategy no. 18 *use tables, figures, and pictures to help understanding*. He claimed that a picture of a man with a white light in his right eye on that particular page aided him in understanding the story faster. Reading the first paragraph, he encountered a difficult word, *prosthetic* replacement; he did not stop to look up the vocabulary in a dictionary but instead guessed its meaning from context clues. Dealing with a difficult text, Non-Eng 4 employed strategy no. 28 *re-read*. He first read the whole article one time and then re-read it because he did not quite understand it. He mentioned that in his second round reading, he stopped after each paragraph to think about what he was reading. Therefore, strategy no. 19 *stop and think,* was identified.

As to a critical evaluation of an online text or strategy no. 34, the student stated that he sparingly did so when he read non-academic websites. For the particular page on which he performed the think-aloud task, he thought the information was reliable because it referred to a well-known institute. At the end of his think-aloud session, he revealed that, for academic reading, he preferred to print out a hard copy of a text rather than to read

the text online since a webpage usually consists of many interesting things such as pictures, icons, hyperlinks, etc. and that type of layout could distract him from focusing his attention on one page.

In conclusion, the results from the eight focal students' demonstration of their strategies use during their think-aloud sessions revealed that the non-English major group's average amount of strategies reported as being used, as well as their percentages of actual strategies used, were slightly higher than the English major group. These findings could come from the fact that most members in the non-English major group appeared to be proficient English learners. They also seem to be active learners of English even though they were not academically required to take as many English courses as the English group.

Limitations

At the outset of the study, when students were asked to complete the online questionnaire, some items on the 38-item OSORS were skipped. Also some of the items were somewhat similar; for instance, items no. 6 "*I take an overall view of the online text to see what it is about before reading it*" and no. 32 "*I scan the online text to get a basic idea of whether it will serve my purposes before choosing to read*" were rather close. Of the eight students who participated in the think-aloud sessions, five reported using these two strategies together. Therefore, it is suggested that some strategies should be combined to shorten the length of the questionnaire.

It was impractical for the researchers to observe certain strategies in this study. The first problem involved participants' perceptions of the task. The students did not perceive the think-aloud as their real academic task; as a result, strategy no. 4 *take notes* was not observed in all eight think-aloud sessions. The second problem involved the face-to-face presence of the two parties. As the think-aloud sessions were conducted via MSN or SKYPE without a webcam installation, the researchers could not observe the participants' non-verbal language. For instance, strategy no. 19 "*I stop from time to time and think about what I am reading online*" was impossible to observe. To tackle this problem, either an installation of a webcam and remote access software or an on-site interview is recommended.

Implications

Drawing from the result of this study, the researchers have included some pedagogical and research implications as follows:

Since some metacognitive online reading strategies are interrelated, students should be taught to orchestrate such strategies for a more effective reading practice. For instance, it is possible to employ strategies no. 6 *overview before*, no. 10 *review text*, and no. 32 *scan text* at the same time. That is to say, when students scroll down to the bottom of a webpage in an attempt to see its length and organization, they can also take an overall view of the page to see what it is about and scan the text to get a basic idea of whether it will serve their purposes before choosing to read. Doing so, in fact, could save students valuable time for other online activities.

It was revealed in the findings that reading aloud was used as one of the strategies that could aid students to get back on track when their concentration was lost. Moreover, it could help students to pay closer attention to the text, and it could boost students' comprehension when an online text became difficult. This finding resonated with the claim that reading aloud enticed students to become successful readers and help them with literacy development (Bredekamp, Copple, & Neuman, 2000 cited in Gold, J. & Gibson, A., 2001). Reading aloud, thus, should be emphasized in metacognitive online reading instruction.

Finally, it was found in this study that the non-English major group did not use fewer strategies than the English major group when dealing with online English reading. When the researchers closely reviewed their demographic data, this group of non-English major students appeared to be comparable with the English major group in terms of hours per day spent online and years of studying English. In other words, they were perceived as being proficient English readers. It would be fruitful for future research in the same vein to explore a group of non-proficient English learners to investigate whether and how they implemented metacognitive online reading strategies, and also, to investigate whether there were any similarities or discrepancies in strategy use, when the same learner reads websites in English and in his/her native language.

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