A Design of Wiki-based Collaborative Reading Lessons to Improve Thai EFL University Students’ Reading Comprehension Skills*  
การพัฒนาบทเรียนการเรียนการอ่านแบบร่วมมือกันโดยใช้วิกิเพื่อพัฒนาความเข้าใจในการอ่านของนักศึกษามหาวิทยาลัยระดับปริญญาตรีที่ใช้ภาษาอังกฤษในฐานะภาษาต่างประเทศ  

collaborative learning, reading comprehension, wiki
In Thailand, where English is taught as a foreign language, students’ difficulties in comprehending English passages and sub-standard English have been frequently reported across different levels of education (Anusornorakarn, 2002; Chinwonno, 2001; Saitakham, 2010; Suppasetseree, 2005). Of several causes, improper pedagogical methodology has been reported to be the major problem. Most English reading classes in Thailand are still mainly conducted in a teacher-centered fashion, in which the teacher takes full control of the lessons and classroom (Wisaijorn, 2003). This conventional pedagogy fails to take students’ creativity, exchange of ideas, and active participation into account (Chareonwongsak, 2002), which in turn leads to a lack of students’ motivation, interaction (Chandavimol, 1998), and eventually failure in reading comprehension.

As a consequence, a more student-centered instructional approach called collaborative learning, in which students work together in small groups of four to six members to discuss and share ideas together in carrying out assigned learning activities, has been proposed to substitute traditional reading instruction methods (Grabe & Stoller, 2002; Zhang, 1993). Moreover, research has suggested that the use of an online technology application called wikis can effectively promote student interaction as well as language learning in various aspects. A considerable number of research has proved that wikis could also facilitate EFL students’ reading comprehension (Chang, 2009; Verezub & Wang, 2008). Furthermore, wikis have been successfully used in promoting students’ collaboration, which enhances their interaction and improving their communication skills through online group discussions (Godwin-Jones, 2003).

Similar to many EFL students at other universities in Thailand, undergraduate students at Suranaree University of Technology (SUT henceforth), the first autonomous public university in Thailand, have faced problems of low proficiency in English in various aspects, especially in reading comprehension, as reported by many of its in-house research studies. Wannaruk (2008), for example, stated that communication in English was a major problem of most SUT undergraduate students because they had
little exposure to English contexts, and most of their English lessons placed less emphasis on listening and speaking skills. Moreover, Ward (2000) discovered that most engineering students at SUT had problems in reading subject-specific English textbooks. His findings indicate that most students have a low knowledge of the necessary vocabulary. Likewise, Suppasetserere (2005), in his study on the use of a web-based instruction in an English remedial course, reported problems in English reading and writing skills of SUT students, of which most of them achieved very low scores in their University Entrance Examination the English language part. Another study by Saitakham (2010) revealed that a large number of SUT undergraduate students had difficulties in reading English texts because of their low vocabulary knowledge.

Apart from students’ deficiency in English reading, another potential challenge for English instructors at SUT is having to teach large classes, especially in English 3 and English 4 Courses, which place their primary focus on developing students’ reading comprehension skills. The classes of both courses usually have an average of ninety-five students. Within such a large class size, the possibilities for substantial participation of the students, involvement, group discussion in the lessons, and teachers’ evaluation of their learning processes are very limited. This results in a major obstacle to students’ effective learning (Hayes, 1997).

In order to address the aforementioned challenges, the present study was conducted to answer the following research questions:

1. Does the efficiency of Wiki-based Collaborative Reading Lessons (WCR Lessons) improve students’ reading comprehension achieve the 80/80 Standard?
2. What are the effects of Wiki-based Collaborative Reading Lessons (WCR Lessons) on students’ reading comprehension?
3. What is the students’ level of satisfaction with Wiki-based Collaborative Reading Lessons (WCR Lessons) to improve their reading comprehension?

Literature Review
Reading Strategies

According to Chamot (2008), reading strategies are embedded in language learning strategies, which are for the most part unobservable, though some may be associated with observable behaviors. Like other language learning strategies, reading strategies are identified through learners’ verbal reports while they are engaged in reading tasks since their mental processes cannot be captured by direct observation (Cohen, 1998; O’Malley & Chamot, 1990; Rubin, 1975; Wenden, 1991).

Generally, when readers have comprehension problems while reading, they tend to use some strategies to overcome those obstacles. Different learners may have different ways to deal with comprehension problems, either intentionally or unconsciously. As a consequence, the term “reading strategy” has been defined in a number of ways.
There is, yet, no consensus among researchers as to its precise definition, as it is difficult to differentiate reading strategies from other processes, such as thinking, studying or motivational strategies; and also to determine whether strategies are global or specific (Paris, Wasik, & Turner, 1991). For example, Paris, Lipton, and Wixon (1983) refer to reading strategies as deliberate cognitive steps that learners consciously follow in order to assist in the acquisition of new information. Additionally, Garner (1987) defines reading strategies as an action or series of actions employed in order to construct meaning. Likewise, Abbott (2008) views reading strategies as the mental operations readers choose to employ in order to make sense of what they read. In a more profound view, Anderson (2003) interestingly remarks that reading strategies are both observable and unobservable processes. He explains that, on the one hand, reading strategies can be conscious actions that learners take to improve their language learning such as note taking and writing down key words; on the other hand, they can refer to mental process, which cannot be directly observed, such as the use of one’s background knowledge or prediction skills to construct an understanding of the text.

According to the definitions provided above, it can be concluded that reading strategies are the ways that a reader employs, either consciously or unconsciously, to overcome reading difficulties in order to eventually comprehend the text.

**Collaborative Strategic Reading (CSR)**

A considerable number of research studies during the past three decades have placed their focuses on comprehension strategy instruction as an attempt to help students become strategic readers and to help them overcome difficulties in comprehending English passages (Klingner, Vaughn, & Schunn, 1998; Koda, 2004; Pressley, 2006; Song, 1998).

Of several effective reading instructional methods, Collaborative Strategic Reading (CSR) developed by Klingner et al. (1998) is one of the most renowned comprehension strategy pedagogical techniques, in which students learn to improve their reading strategies through small group discussion (Fan, 2010). The primary goal of CSR instruction is to enable students to implement comprehension strategies efficiently; therefore, to ensure satisfactory outcome, it is suggested that the teacher teach these reading strategies explicitly while students be encouraged to exercise and practice the strategies continuously in a collaborative learning environment. Incorporated with collaborative learning approach, CSR can create an instructional context in which students, with the help of peers and the teacher, can become competent at employing reading strategies while reading. Therefore, CSR instruction integrates two major phases of instructions: the teaching of reading strategies and collaborative learning (CL).

CSR takes advantage of the growing knowledge among educators that students need to be taught multiple specific strategies to reinforce their understanding of a text without being overwhelmed with so many strategies, which could be complicating for them to decide which ones to use. Based on a number of research trials (such as ones
by Bryant, Vaughn, Linan-Thompson, Ugel, Hamff, & Hougen, 2000; Klingner & Vaughn, 1999, 1999; Vaughn, Klingner, & Bryant, 2001), CSR has been refined and currently consists of four comprehension strategies that students apply in the pre-, while-, and post-stages of reading in small collaborative groups. These reading strategies include the following essential comprehension strategies, namely, (a) Preview, (b) Click and Clunk, (c) Get the Gist, and (d) Wrap-up.

Preview Strategy is intended to activate students’ background knowledge on the target topic. In this pre-reading stage, students discuss about their ideas, present their prior knowledge, and make predictions. Click and Clunk is a strategy that teaches students to monitor their understanding during reading, and to use fix-up strategies when they realize their failure to understand text (Bremer, Vaughn, Clapper, & Kim, 2002). “Click” refers to portions of the text that make sense to the reader whereas “Clunk” means comprehension breakdown. Get the Gist aims at encouraging students to be able to identify the main idea of the text. During the while-reading stage, students learn to identify main ideas, the most important ideas of the passage. This strategy helps them to improve the understanding and memory of what they have read. Finally, Wrap-up Strategy involves the review of important ideas. After the students read the text, they will have to review key ideas and generate questions related to what they have read.

Overview of Wikis

The term “wiki” is derived from the phrase “wiki-wiki,” which means quickly in the Hawaiian language (Wang & Turner, 2004). The first wiki website (which will be called “wiki” from now on) was created by Cunningham in 1995, who described this kind of website as the simplest online database that could possibly work. The main concept behind a wiki website is to keep the website as simple as possible. Richardson (2006, p. 8) describes a wiki as a “collaborative web space where anyone can add content and anyone can edit content that has already been published.” Expanding this definition, wikis are collaboratively created websites in which users are able to create a series of web pages, edit and revise their own and others’ work, provide feedback, keep track of changes, and publish information online with minimal requirements on software and hardware and there is little need for user training (Leuf & Cunningham, 2001). Contents available on wikis are open for editing and feedback to all members at all times, while tracking other members’ contributions, and all the changes of contents can be done with ease.

With their simplicity of website structure and versatility of easily-editable pages, wikis have gained rapidly growing interest from users across various disciplines, including the area of education. The collaborative features of Wikipedia have led educators to see potential in encouraging collaborative learning in language education. Furthermore, when applied to classrooms, a wiki system has potential in promoting student-centered learning environments in which students are encouraged to be the co-
constructors of contents they want to publish online (Bryer & Chen, 2010; Richardson, 2006; Wang & Turner, 2004).

**Previous Studies on the Applications of Wikis in Language Instruction**

As mentioned above, wikis has been applied as a platform for students’ interaction to promote their language production (Bradley, Linström, and Rystedt, 2010). Previous studies have reported on the promising collaborative potentials of wikis in improving various areas of language education.

Chang (2009), for example, investigated the effects of having students providing word meanings in L1 collaboratively using digital pen on a wiki on their satisfaction of doing wiki-based reading in comparison with conventional paper-based reading. The experiment was conducted to 43 college students divided into ten groups of four and one group of three. Each group was assigned to read an academic text, post and comment it on a provided wiki. They were asked to provide the meaning of the words they deemed problematic in Chinese using a digital pen. The findings suggested that most of the students reported being satisfied with the provision of glossing of problematic words, which in turn eased their reading.

In a second study, Chen (2008) conducted an experiment to examine the effects of wikis on students’ language skills, communication channels, attitudes, and experiences in using wikis to improve their English language skills. The participants were 97 Taiwanese college students taking a General English course. They were divided into two groups, an experimental group of 50 students and a control group of 47 students. Using the same English textbook and teaching process, the experimental group was assigned to do online collaborative activities through Wikispaces, whereas the control group was assigned to traditional learning methods. The study demonstrated that the experimental group performed the tasks statistically better than the control group in listening and reading activities. They also expressed positive attitudes towards using the wiki in facilitating them to accomplish the assignments. The students also appreciated the wiki in allowing them to collaborate, negotiate, and contribute to each other.

Furthermore, Kessler (2009) investigated learner-centered collaborative attention to form in a writing course through the use of a wiki. In the study, a class of 40 students was requested to undertake various group work tasks throughout the course that included presentation, feedback, student-teacher interactions, and giving feedback in terms of grammatical accuracy through wikis. Students’ essays were viewed and evaluated in a combination fashion of meaning and form. All edits on wikis were automatically recorded in the system log. The result showed that most of the students had a tendency of their focus of meaning rather than form in their feedback and revision. Moreover, it was also discovered that there was a considerable number of placing additional links to other web resources, and font adjustments to favor visitors’
understanding to the contents. Also, the interviews also showed that the students appreciated using collaborative technologies in helping them with grammatical accuracy.

McDonald (2007) investigated how collaborative learning assisted students’ English writing, especially in raising their awareness of language accuracy. In the study, a group of third-year university students were required to construct their own wiki about interesting areas in Sengari University, in English. All of the students were assigned to work in pairs. Each pair was assigned to find information from different resources such as the library, staff interview, and online search. Then, the students were asked to post their information on their wikis. After that, they evaluated their wiki collaboratively to develop it in terms of both content and grammar. Finally, the students were requested to present their wiki to the instructors orally. The findings suggested that the students were motivated in learning via wiki. They also expressed positive opinions towards doing group work. Moreover, the participants reported that working in groups helped them learn how to correct some grammar points in their writing.

Wichadee (2010) investigated the effects of a wiki on students’ summary writing. In her experiment, a class of 35 students was selected as the participants. Throughout the course, the students were assigned to do summaries of five articles in the text books in groups of four to five members. Each group started each task with a member’s posting his/her summary on a wiki, then, other members in the group reviewed it. Once any information was corrected, students needed to justify for changing it. At the end of each task, the teacher gave the feedback or suggestions for writing improvement. The experiment revealed significant improvement in students’ summary writing, and students’ satisfaction on the use of the wiki for peer-correction.

Similarly, Yutdhana (2010) carried out a study on the application of a wiki to promote collaborative writing. In her experiment, twenty third-year undergraduate students were selected as the participants. The students were organized into five heterogeneous groups of four members. Each group was assigned to do a piece of writing project on a wiki operated on Moodle, specifically designed for the class. Edits and changes of content were tracked using wiki logs. Once the students’ project was accomplished and successfully published on the wiki, students were required to take a two-hour timed writing test, individually. Students’ test was, then, evaluated by two raters using analytical scoring. The results revealed that there was a high correlation between the students’ use of wiki for editing their work and their writing test scores. Moreover, collaborative writing through the wiki had positive effects on students’ perceptions and performances.

Research Methodology

Research Context

English classes at SUT were divided into two weekly sessions: a tutorial session and a computer laboratory session. The tutorial session took place in a normal classroom for two periods of fifty minutes, while the computer laboratory session lasted
one period of fifty minutes. In the present study, however, the tryout and experiment were conducted only in the computer laboratory sessions. The participants were assigned to do online activities in Wiki-based Collaborative Reading Lessons (WCR Lessons henceforth) created by the researcher following the course syllabus of English III.

**Population and Samples**

The population and samples of the present study were divided into two main groups: population and samples for the developmental stage and the experiment stage, respectively. The population consisted of undergraduate students at Suranaree University of Technology enrolled in the English III Course at the time the tryouts and experiment were conducted. The tryouts were intended to pilot and evaluate the research instruments to assess the efficiency of WCR Lessons, the pre- and post-tests, and the questionnaire, while the experiment stage was conducted to measure the effects of WCR Lessons on students’ learning outcomes, and their satisfaction on the lessons.

**Population and Samples for the Developmental Stage**

The tryouts were carried out to determine the efficiency of the WCR Lessons and to evaluate the other research instruments. The population consisted of 1,300 undergraduate students enrolled in the English III Course in Trimester 1/2013. The samples were divided into 3 groups, one group of 64 students for the tryouts of WCR Lessons, another group of 120 students for piloting the tests, and the last group of 30 students for piloting the questionnaire.

**Population and Samples for the Experiment Stage**

The population of the Experiment Stage or the main study was 800 undergraduate students who enrolled in the English III Course at SUT in Trimester 2/2013. A number of ninety-five students from two intact classes were purposively selected as the participants of the main study.

**Research Instruments**

Research instruments of the present study included WCR Lessons, a set of pre- and post-tests, and a questionnaire, and a semi-structured interview.

WCR Lessons were designed on a free wiki-based website called “PBWorks.” The lessons were comprised of three units, covering the contents of the textbook, Read This 2, which was employed in normal classroom. Each unit contained activities that were designed to promote students’ discussions with exercises and end-of-unit quizzes to the students. Furthermore, each unit consisted of three main parts: pre-reading, while-reading, and post-reading parts. Each part contained a group discussion part, where the students were requested to post their opinions and comments on the given discussion activities. The pre-reading part contained a preview of the topic and preview of key vocabulary of the text in the lesson. The while-reading part included identifying
key words and main ideas of each paragraph. The post-reading part focused on summarizing the text the students have just read and relating it to students’ real world experience.

The pre- and post-tests consisted of two reading passages and 20 multiple-choice items with five different types of comprehension questions, namely, dealing with vocabulary, finding pronoun referents, identifying the main idea, finding supporting details, and making inferences.

The questionnaire consisted of three parts. The first part was related to the demography and experience in online learning of the participant. This part aimed to explore general information such as name, age, field of study, and his/her experience in online instruction of the participant. The second part was the participant’s satisfaction with the lessons and activities on the wiki. The final part was an open-ended question asking the participant about his/her difficulties and comments about the lessons and activities on the wiki.

**Research Procedure**

The present study employed a one-group pre-test and post-test design, and was divided into two stages: the developmental stage and the experimental stage. The developmental phase was intended to construct, pilot, and evaluate the research instruments whereas the experimental phase was conducted to investigate the effects of WCR Lessons and students’ satisfaction and opinions towards the lessons.

**The Developmental Stage**

In this stage, WCR Lessons, the reading tests, and questionnaire were created and tried out. First, WCR Lessons were designed in accordance with English III course outline. After that, the lessons were evaluated for content validity. Then they were piloted in the Three-Step Tryouts: Individual Testing, Small-group Testing, and Field-study Testing, respectively, on the basis of the 80/80 Standard proposed by Brahmawong (1978) to examine whether the lessons were efficient in terms of the process and product of learning. The 80/80 standard is symbolized as $E_1/E_2$, where $E_1$ refers to the former 80 and $E_2$ the latter 80. The former 80 represents the percentage of students’ learning process evaluated through their performance in doing exercises of each learning unit. The latter 80 refers to the percentage of students’ learning products evaluated through their performance in taking end-of-unit tests.

Individual Testing was conducted to a heterogeneous group of 4 students in terms of language proficiency classified as low, intermediate, and high. This was, however, different from a usual practice of this tryout stage, in which only 3 participants are required. This was because the present study followed the procedure of collaborative
study, which specifies that a collaborative group consist of at least four members. As a result, Individual Testing of this research involved 4 participants: one low, two moderate, and one high proficiency students. First, an orientation for the use of PBWorks website and collaborative learning was provided to the four students. Then the participants were asked to do online lessons and exercises on wiki, both individually and collaboratively as specified by the activities. While taking WCR Lessons, the students were requested to take formative exercises, then, at the end of each learning unit they were asked to take the end-of-unit quiz. Their scores in the exercises and quizzes were later used for the evaluation of the efficiency of WCR Lessons. The students were also requested to give comments on the lessons and the use of wiki for further improvement of the instruction.

Similarly, the other two tryouts, Small-group Testing and Field Testing, followed the same procedure as that of Individual Testing; however, the only difference between the two tryouts was the number of participants. Small-group Testing required 16 participants whereas the Field-study Testing needed 44 participants. Furthermore, the questionnaire was also trialed to the participants of the Field-study Testing.

Parallel with the Three-Step Tryouts were the pilots of the questionnaire and the pre- and post-tests. The questionnaire was tried out to the 44 participants in the Field-Study Testing. The results showed that the questionnaire had an acceptable level of reliability ($\alpha = .798$). The tests were piloted to a group of 120 English III students who were not the participants in the Three-Step Tryouts. The results revealed that the pre-test and the post-test had statistically acceptable levels of reliability ($\alpha = .734$ and $\alpha = .717$, respectively).

The Experimental Stage

In the experimental stage, two intact classes enrolled in English III Course at SUT in Trimester 2/2013 of totally 95 students, were purposively selected to be the participants of the main study, which was conducted in a one-group quasi-experiment research design. Prior to the intervention using WCR lessons, the participants were required to attend an orientation to WCR Lessons. Then they were also pre-tested for their English reading comprehension abilities. On the basis of the pre-test scores, the students were also divided into heterogeneous groups of four to five members with at least two out of three different levels of language proficiency.

The main study lasted from Week 2 to Week 11 in the computer laboratory periods, 55 minutes per week. The participants were assigned to do activities in WCR Lessons. While carrying out discussion activities, their discussions and the extent of their interactions through posting on the wiki were observed. After the 10-week intervention, a post-test with similar level of difficulty as of the pre-test was administered to the participants to examine their achievements in reading
comprehension. All participants were, later, requested to complete the questionnaire on their satisfaction and opinions towards WCR Lessons. After that, a semi-structured interview was carried out to ten participants, who were randomly selected from the overall samples. With the participants’ permission, the interview was audio recorded using a digital audio recorder. In the final stage, the recorded information was later transcribed verbatim.

**Data Analysis**

In order to answer the research questions, both quantitative and qualitative research approaches were employed. The quantitative research techniques were used to examine the efficiency of WCR lessons, determine the students’ achievements in English reading comprehension before and after the instructional intervention, and finally to analyze students’ satisfaction and opinions towards WCR lessons from the questionnaire. The qualitative methods were applied to obtain in-depth information of students’ satisfaction and opinions towards WCR lessons from the semi-structure interview and the open-ended part of the questionnaire.

To examine English learning achievement in the reading comprehension of the students, the differences between their pre- and post-tests scores, a dependent-samples t-test were administered. The data were analyzed using SPSS, a computer software for statistical analysis. In terms of students’ satisfaction with WCR Lessons obtained from the questionnaire, since the data were in five-point Likert’s scale, they were analyzed using arithmetic means. The mean values indicated the students’ perceptions of online collaborative learning via wiki. To interpret the results, the opinions were divided into five ranges with “1” = strongly disagree, “2” = disagree, “3” = undecided, “4” = agree, and “5” = strongly disagree, respectively. Finally, for the interview, a transcription of the conversation was axial coded to identify themes relating to the study. Once the coding was completed, all the themes were re-analyzed to identify the similarities and differences between the interviewees to help form a picture of the findings in more details.
Results

Results of the Efficiency of WCR Lessons of the Experiment

Table 1 Results of the Efficiency of WCR Lessons of the Experiment

<table>
<thead>
<tr>
<th>Testing Step</th>
<th>Learning Unit</th>
<th>E1</th>
<th>E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment (Trial Run)</td>
<td>1</td>
<td>81.63</td>
<td>81.47</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>81.75</td>
<td>81.38</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>80.67</td>
<td>80.23</td>
</tr>
</tbody>
</table>

According to Table 1, the E1/E2 scores of the three learning units of WCR Lessons were 81.63/81.47, 81.75/81.38, and 80.67/80.23, respectively. Obviously, the efficiency of all the exercises and quizzes satisfied the 80/80 Standard criterion. The results indicated that WCR Lessons were efficient and able to fulfill the learning objectives and appropriate for English reading instruction.

Results of the Participants’ Reading Comprehension Achievements

In order to evaluate students’ achievements in English reading comprehension ability before and after the intervention, a parallel pre- and post-test was administered. Table 5 shows the results of the students’ overall reading comprehension in the pre- and post-tests.

Table 2 Results of the Students’ Overall Reading Comprehension in the Pre- and Post-tests

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>11.41</td>
<td>95</td>
<td>2.595</td>
<td>.266</td>
</tr>
<tr>
<td>Posttest</td>
<td>12.16</td>
<td>95</td>
<td>3.250</td>
<td>.333</td>
</tr>
</tbody>
</table>

As presented in Table 2, the students’ average scores of the pre-test and post-test were 11.41 (SD = 2.595) and 12.16 (SD = 3.250) respectively. In order to investigate whether there was a significant difference between the scores of the pre- and post-tests, a paired samples t-test was performed. The results of the t-test are presented in Table 3.
Table 3. Results of Paired Samples t-test for the Experimental Group

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>95% Confidence Interval of the Difference</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Diff. (pre-post)</td>
<td>SD</td>
<td>Lower</td>
<td>Upper</td>
<td></td>
</tr>
<tr>
<td>-.747</td>
<td>1.968</td>
<td>-1.148</td>
<td>-.347</td>
<td>-3.702</td>
</tr>
</tbody>
</table>

Table 3 reveals that there is a highly significant difference \((p<.01)\) between the mean scores of the pre- and post-tests of the students. This indicates that the students who participated in the WCR Lessons made remarkable progress in their reading comprehension skills. This finding corresponds with the third research question of the study.

In order to investigate in more details what reading comprehension skills the WCR lessons had an impact on students’ reading achievements, paired-sample t-tests were further conducted on five types of different reading comprehension questions: identifying main ideas, finding supporting details, making inferences, dealing with vocabulary, and finding pronoun referents, of the pre-and post-tests. The results of the paired-sample t-tests of students’ reading achievements with regard to the five different types of comprehension questions are shown in Table 4.

Table 4. The Results of the Paired Sample t-tests of the Students’ Reading Achievements with Regard to Five Types of Comprehension Questions

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>95% Confidence Interval of the Difference</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Diff. (pre-post)</td>
<td>SD</td>
<td>Lower</td>
<td>Upper</td>
<td></td>
</tr>
<tr>
<td>Pair 1</td>
<td>MI_pre - MI_post</td>
<td>-.232</td>
<td>1.115</td>
<td>.114</td>
</tr>
<tr>
<td>Pair 2</td>
<td>SD_pre - SD_post</td>
<td>-.242</td>
<td>.931</td>
<td>.095</td>
</tr>
<tr>
<td>Pair 3</td>
<td>Inf_pre - Inf_post</td>
<td>-.105</td>
<td>1.180</td>
<td>.121</td>
</tr>
<tr>
<td>Pair 4</td>
<td>Voc_pre - Voc_post</td>
<td>.063</td>
<td>.897</td>
<td>.092</td>
</tr>
<tr>
<td>Pair 5</td>
<td>Ref_pre - Ref_post</td>
<td>-.263</td>
<td>1.169</td>
<td>.120</td>
</tr>
</tbody>
</table>
The data in Table 4 show that there were significant differences in students’ performance in the pre- and post-reading comprehension tests in three types of comprehension questions: identifying main ideas, finding supporting details ($p < .05$). On the contrary, no significant differences in students’ performance in the other two types of comprehension questions: dealing with vocabulary and finding pronoun referents were observed. In other words, the results demonstrate that the students outperformed in the posttests in identifying main ideas, finding supporting details, and making inferences. However, they did not demonstrate any different outcomes in the posttest in comparison with the pre-test with regard to dealing with vocabulary and finding pronoun referents.

**Results of the Questionnaire**

The findings of the questionnaire revealed that most of the students strongly agreed that the WCR Lessons encouraged them to express their opinions as well as their ideas more openly online ($\bar{X} = 4.01$); and they were also be able to track the work progress of their groups ($\bar{X} = 3.75$). In terms of anxiety, the students agreed that they felt less nervous using English to work on online assignments with their teammates ($\bar{X} = 3.73$). Regarding satisfaction with WCR website, the students found the website was user-friendly ($\bar{X} = 3.86$). They also agreed that they did not have difficulties in posting their comments and opinions on the website ($\bar{X} = 3.74$), and WCR Lessons suited their level of English proficiency ($\bar{X} = 3.72$). In terms of the impact of WCR Lessons on students’ English reading comprehension skills, the findings suggested that the participants strongly agreed that WCR Lessons helped them improve their reading comprehension skills ($\bar{X} = 4.27$) and encouraged them to use reading strategies learned in the classroom ($\bar{X} = 4.17$) as well as helping them. Moreover, they perceived the activities as raising their motivation to read English passages ($\bar{X} = 4.09$).
Table 5 Results of the highest-rated items of the Questionnaire

<table>
<thead>
<tr>
<th>Statement</th>
<th>( \bar{X} )</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students’ Satisfaction with the WCR Lessons</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WCR Lessons help me to express my opinions and feelings better in English during group discussion.</td>
<td>4.01</td>
<td>.707</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>WCR Lessons enable me to assess the progress of my group work.</td>
<td>3.75</td>
<td>.668</td>
<td>Agree</td>
</tr>
<tr>
<td>I feel less nervous using English with my classmates when doing assignment on WCR Lessons.</td>
<td>3.73</td>
<td>.626</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>Students’ Satisfaction with the WCR Website</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I don’t find it difficult to participate in learning activities on WCR Lessons.</td>
<td>3.89</td>
<td>.535</td>
<td>Agree</td>
</tr>
<tr>
<td>WCR Lessons are user-friendly.</td>
<td>3.86</td>
<td>.576</td>
<td>Agree</td>
</tr>
<tr>
<td>I don’t have difficulties with posting my comments and opinions on WCR Lessons.</td>
<td>3.74</td>
<td>.569</td>
<td>Agree</td>
</tr>
<tr>
<td><strong>Impacts of WCR Lessons on Students’ English Reading Comprehension Skills</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The lessons and activities in WCR Lessons help improve my English reading comprehension skills.</td>
<td>4.27</td>
<td>.515</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Lessons promote the use of reading strategies.</td>
<td>4.17</td>
<td>.519</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>WCR Lessons increase my motivation to read English passages.</td>
<td>4.09</td>
<td>.527</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

**Discussion and Conclusion**

Regarding the efficiency of WCR Lessons of the experimental stage, \( E_1/E_2 \) levels of the lessons met the 80/80 Standard. This can be interpreted that the efficiency of students’ learning process (activities and quizzes) was higher than that of students’ learning products (end-of-unit tests). These findings could be because the students were allowed to do each exercise and quiz up to three times, whereas they could do each end-of-unit test only once. It could mean that the permitted repetitive practices and greater exposure to the exercises helped the participants learn more skills and acquire a better understanding of the lessons and quizzes than they did in the tests. This result was consistent with the findings in the studies by Suwanbenjakul (2002) and Kongpet Dennis (2011). Suwanbenjakul (2002), the former study, asserted that the efficiency of students’ learning process (\( E_1 \)) was higher than that of the learning product (\( E_2 \)) because the students had more interest in doing the activities and exercises on the web.
As a result, they were encouraged to gain higher scores when they practiced later. She also added that it was possibly because the tests were more difficult than the exercises, so students were likely to achieve lower scores than they did in the exercises. Similarly, in the latter study, Kongpet Dennis stated in her research that the students gained higher scores in the exercises than the tests possibly because they could repeat the exercises at teacher discretion, but they could do the tests only once.

Concerning students’ reading comprehension achievements, the results revealed that the students achieved higher average scores ($p < .05$) in the posttest ($\bar{x} = 12.16$) than the pretest ($\bar{x} = 11.14$). This demonstrates that WCR Lessons had significant effects on students’ reading comprehension. Nevertheless, considering separate reading comprehension skills, it was found that the students significantly outperformed only in the top-down reading skills such as identifying the main ideas, finding supporting details, and making inferences. In terms of the bottom-up skills such as dealing with vocabulary and finding pronoun referents, no significant differences in students’ performances were observed. These findings suggested that collaborative learning could enhance students’ abilities in applying higher cognitive skills to analyze and get the gist of reading texts.

With reference to the statistical improvement in students’ ability to identify main ideas and find supporting details, the results were consistent with the following previous studies. Song (1998) discovered that comprehension strategy instruction yielded positive effects on EFL students’ performance in identifying main ideas. Similarly, the study of Chen (2005) revealed that reading strategy instruction significantly enhanced students’ ability in identifying main ideas and the supporting details of reading texts. Another study by Fan (2009) also confirmed that collaborative strategic reading (CSR) helped the students significantly improved their ability in identifying the main ideas and the supporting details. In this study, it could be explained that the students were trained to read for gist in collaborative groups. They were provided with extensive practice on identifying topic sentences, key words, and the main idea of each paragraph. In addition, they were also trained to distinguish main ideas from supporting ideas. Through these collaborative activities, the students discussed with each other and helped construct the knowledge necessary for identifying the main idea, the supporting details of the paragraph, and eventually making inferences from the text.

The statistically non-significance of the differences in the students’ performance in the pre- and post-tests in terms of vocabulary and using referents was presumably because in WCR Lessons, the students were required to work on vocabulary exercises and quizzes individually at their own pace. Moreover, there were comparatively few exercises on using referents. Besides, the online class was faced with a strict time limit of approximately 50 minutes a session. Time restriction and students’ individual differences in learning might have been prominent obstacles to the students’ vocabulary gains and to improvements in their skill in using referents. This is because vocabulary
learning is an on-going and life-long process and it is predominantly influenced by individual differences which include differences in age, attitude, intelligence, language proficiency level, and learning style.

In terms of students’ satisfaction with the lessons, the results demonstrated that the students strongly agreed that WCR Lessons encouraged them to express their opinions and feelings in English while they were having group discussions. This could be because the students had less anxiety in expressing their ideas in English on wiki than they did in a face-to-face setting like in classroom. Furthermore, WCR lessons provided real-world content and numerous activities such as identifying keywords and main ideas of the given passages that encouraged the students to think logically and critically. Additionally, the students perceived WCR Lessons as being very satisfactory because the lessons enabled group members to assess the progress of group work. Since wikis are usually designed to be accessible to only the users who belong to the group. This means that any member can have access to the group wiki, unless it is intended to provide limited access, in order to post comments and check the progress and history of the group work. Overall, the students expressed positive perceptions and high levels of satisfaction with WCR lessons. They found collaborative learning challenging and motivating. They also reported that they were delighted to contribute themselves to the groups to carry out collaborative activities.

**Limitations of the Study**

The present study was restricted to the following limitations.

First, time duration of the intervention was considerably short. The students at Suranaree University of Technology only had a weekly session of 50 minutes in the computer laboratory for an English class. As a result, it is quite a problem for online instruction and collaborative learning activities to be accomplished in time.

Secondly, collaborative learning and the use of wikis for learning were considered new to the students. The unfamiliarity of both the instructional method and tool might have influential impacts on students’ performance in doing the assignments at the beginning. It took quite a long while for them to get more accustomed.

Finally, the sample size of the present study was limited to two intact classes at a government university in Thailand, totaling 95 students, which is considered a small number. Moreover, the findings and impacts of the intervention were highly context specific. Consequently, the results of the study may not be able to generalize the norm of EFL students elsewhere.
Suggestions for Further Research

Followings are suggestions that might be taken into consideration for future research in the area of online collaborative learning and reading comprehension teaching.

Firstly, collaborative learning has been recognized to be an effective pedagogical approach, but very few studies have adapted this technique for both online and reading instruction. Moreover, the present study has confirmed that collaborative learning is appropriate and effective for EFL reading instruction. Therefore, more studies regarding the use of this pedagogical approach should be carried out to promote EFL reading skills, in particular.

Secondly, in order to further validate the effectiveness of online collaborative learning, a wider range of sample size from different disciplines and a longer period of intervention should be taken into consideration.

Thirdly, as suggested by the findings of the interview, students’ interpersonal skills should be explicitly trained to minimize the difficulty of relationship and unwillingness to communicate among group members.

Finally, it is advisable that WCR Lessons be applied to other learning contexts in terms of place and level of study to verify whether they are effective in other settings.

Acknowledgements

The first author gratefully acknowledges the Office of the Higher Education Commission (Thailand) for its grant fund under Cooperative Research Network for Ph. D. Program. Our sincere thanks also go to the School of Foreign Languages, Suranaree University of Technology, for their support to the study.
References


