การพัฒนารูปแบบการเรียนการสอนการอ่านแบบร่วมมือโดยใช้วิกิสำหรับนักศึกษาระดับมหาวิทยาลัยที่ใช้ภาษาอังกฤษเป็นภาษาต่างประเทศ

นายศุภรัตน์ วัลกานนท์

THE DEVELOPMENT OF A WIKI-BASED

COLLABORATIVE READING INSTRUCTIONAL

MODEL FOR EFL UNIVERSITY STUDENTS

Suparat Walakanon

A Thesis Submitted in Partial Fulfillment of the Requirements for

the Degree of Doctor of Philosophy in English Language Studies

Suranaree University of Technology

Academic Year 2014

THE DEVELOPMENT OF A WIKI-BASED COLLABORATIVE

READING INSTRUCTIONAL MODEL FOR EFL

UNIVERSITY STUDENTS

Suranaree University of Technology has approved this thesis submitted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy.

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ศุภรัตน์ วัลกานนท์ : การพัฒนารูปแบบการเรียนการสอนการอ่านแบบร่วมมือโดยใช้วิกิ
สำหรับนักศึกษาระดับมหาวิทยาลัยที่ใช้ภาษาอังกฤษเป็นภาษาต่างประเทศ
(THE DEVELOPMENT OF A WIKI-BASED COLLABORATIVE READING
INSTRUCTIONAL MODEL FOR EFL UNIVERSITY STUDENTS) อาจารย์ที่ปรึกษา :
อาจารย์ ดร.สุขสรรพ์ ศุภเศรษฐเสรี, 318 หน้า

งานวิจัยฉบับนี้ มีวัตถุประสงค์เพื่อ (1) พัฒนารูปแบบการเรียนการสอนการอ่านแบบ
ร่วมมือกันโดยใช้วิกิ (WCR Instructional Model) สำหรับนักศึกษามหาวิทยาลัยระดับปริญญาตรีที่ใช้
ภาษาอังกฤษในฐานะภาษาต่างประเทศ (2) เพื่อประเมินประสิทธิภาพบทเรียนการเรียนการสอนการ
อ่านแบบร่วมมือกันโดยใช้วิกิโดยใช้เกณฑ์มาตรฐาน 80/80 (3) เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการ
เรียนของนักศึกษาก่อนและหลังการเรียนด้วยบทเรียนการเรียนการสอนการอ่านแบบร่วมมือกันโดย
ใช้วิกิ (4) เพื่อหารูปแบบการอภิปรายกลุ่มของนักศึกษาในการทำกิจกรรมการอ่านในบทเรียนการ
อ่านแบบร่วมมือกันโดยใช้วิกิ (5) เพื่อศึกษาระดับความพึงพอใจและเจตคติของนักศึกษาที่มีต่อการ
เรียนการสอนการอ่านแบบร่วมมือกันโดยใช้วิกิ

ผู้เข้าร่วมในงานวิจัยครั้งนี้ คือนักศึกษาระดับปริญญาตรีแห่งมหาวิทยาลัยเทคโนโลยีสุรนารี
จำนวน 95 คนในภาคการศึกษาที่ 2/2013 โดยนักศึกษาถูกจัดกลุ่มแบบคละระดับความสามารถ
ทางด้านภาษาอังกฤษจำนวน 20 กลุ่ม เพื่อเข้าเรียนโดยใช้แบบเรียนแบบร่วมมือกันโดยใช้วิกิ โดยมี
ระยะเวลาการทดลอง 10 สัปดาห์ โดยผลของการศึกษามีดังต่อไปนี้

(1) รูปแบบการเรียนการสอนการอ่านแบบร่วมมือกันโดยใช้วิกิที่พัฒนาขึ้น ได้รับการ
ประเมินจากผู้เชี่ยวชาญให้อยู่ในเกณฑ์ "เหมาะสม" และ "เป็นที่น่าพอใจ" โดยมีค่าเฉลี่ย
4.67

(2) บทเรียนทั้ง 3 บทของการอ่านแบบร่วมมือกันโดยใช้วิกิที่พัฒนาขึ้นมีค่าประสิทธิภาพ
อยู่ที่ 81.63/ 81.47 81.75/81.38 และ 80.67/80.23 ตามลำดับ ซึ่งทั้งหมดเป็นไปตาม
เกณฑ์มาตรฐาน 80/80 ที่ตั้งไว้

(3) ผลของการวัดผลสัมฤทธิ์ทางการเรียนรู้ของนักศึกษาโดยจำแนกตามประเภทของคำถาม
พบว่าผลสัมฤทธิ์ของนักศึกษาในส่วนของทักษะการหาใจความหลัก ข้อมูลสนับสนุน
และการอนุมานความหมายของเนื้อหามีความแตกต่างกันอย่างมีนัยสำคัญ

(4) ผลการวิเคราะห์รูปแบบการอภิปรายของนักศึกษาบนเครือข่ายอินเตอร์เน็ตโดยใช้
รูปแบบการวิเคราะห์ปฏิสัมพันธ์ของ Gunawardena และคณะ (1997) พบว่านักศึกษามี
การอภิปรายมากที่สุดในขั้นที่ 1 (การออกความคิดเห็นและเปรียบเทียบความคิดเห็นกับ

สมาชิกคนอื่น) โดยคิดเป็นร้อยละ 68 ของจำนวนการอภิปรายทั้งหมด และนักศึกษามี
จำนวนการอภิปรายน้อยที่สุดในขั้นที่ 4 (ทดสอบ ดัดแปลง สังเคราะห์ความคิดเห็นหรือ
การสร้างแนวความคิดร่วมกัน) โดยคิดเป็นร้อยละ 3.2 ของจำนวนการอภิปรายทั้งหมด

(5) ผลของแบบสอบถามและการสัมภาษณ์รายบุคคลแสดงให้เห็นว่านักศึกษามีเจตคติที่ดี
และมีความพึงพอใจต่อบทเรียนการอ่านแบบร่วมมือกันโดยใช้วิกิ และนักศึกษาได้
แสดงความคิดเห็นว่าบทเรียนการอ่านแบบร่วมมือกันโดยใช้วิกิช่วยพัฒนาทักษะด้าน
การอ่านของตนเอง

สาขาวิชาภาษาต่างประเทศ   ลายมือชื่อนักศึกษา_____

ปีการศึกษา 2557   ลายมือชื่ออาจารย์ที่ปรึกษา_____

SUPARAT WALAKANON : THE DEVELOPMENT OF A WIKI-BASED COLLABORATIVE READING INSTRUCTIONAL MODEL FOR EFL UNIVERSITY STUDENTS. THESIS ADVISOR : SUKSAN SUPPASETSEREE, Ph.D., 318 PP.

INSTRUCTIONAL DESIGN/READING COMPREHENSION INSTRUCTION/ COLLABORATIVE LEARNING/ONLINE LEARNING/WIKI/ EFL STUDENTS

The objectives of the present study were (1) to develop Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model) for EFL undergraduate students; (2) to determine the efficiency of Wiki-based Collaborative Reading Lessons (WCR Lessons) on the basis of the 80/80 standard; (3) to investigate the effects of wiki-based collaborative reading lessons on students' reading achievements before and after the intervention; (4) to determine patterns of students' discussion while doing reading activities; and (5) to explore students' satisfaction and opinions towards WCR Lessons.

The samples of the study were ninety-five undergraduate students at Suranaree University of Technology in Trimester 2/2013, who were organized into twenty heterogeneous groups to participate in a 10-week intervention. The results of the study were as follows:

1. WCR Instructional Model was rated by the three experts at the mean score of 4.67, indicating that the model was appropriate and satisfactory for EFL online reading instruction.

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2. The efficiency of the learning process and product (E_1/E_2) of the three units of WCR lessons were 81.63/ 81.47, 81.75/ 81.38, and 80.67/80.23, respectively, which met the 80/80 Standard criterion. The results demonstrated that WCR lessons were proved to be effective for EFL online reading instruction.

3. The results of students' reading achievements indicated that the students obtained significant higher scores in the posttest than the pretest. In terms of different reading comprehension questions in the tests, the participants significantly outperformed in the questions related to identifying the main ideas, supporting details, and making inferences of the reading passages.

4. Based on the interaction analysis model (IAM) proposed by Gunawardena, Lowe, and Anderson (1997), the students' online discussion took place most rigorously in Phase I (sharing and comparing opinions of other group members), which accounted for 68% of the overall students' posts. On the other hand, the smallest amount of discussion was observed in Phase IV (Testing and Modification of Proposed Synthesis or Co-construction) at 3.2% of the overall posts.

5. The findings from the questionnaire and the interview indicated that the students expressed positive opinions towards WCR lessons. They were satisfied with the lessons and believed the lessons helped them improve their English reading skills.

School of Foreign Languages   Student's Signature _____

Academic Year 2014   Advisor's Signature_____

ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION

The present study intends to develop an online collaborative reading instructional model through the use of wiki to promote online collaborative learning in reading classrooms. This chapter aims to provide an overview of the background of the study, statement of the problems, purposes of the study, research questions and hypotheses, definitions of key terms, significance of the study, and limitations of the study.

1.1 Background of the Study

Reading ability is essential for students' academic achievement in almost every subject area, including language learning across all levels of education, especially at the university level (Gillet & Temple, 2000), and also for professional success and, indeed, for lifelong learning (Pritchard, Romeo, & Muller, 1999). This is because students need to read magazines, textbooks, or learning materials that are written in the target language in order to gather information for their academic subjects.

In terms of English language learning as a foreign language (EFL), Day and Bamford (1998) postulate that the ability to read offers opportunities for the development of language skills. This notion of the importance of reading corresponds with Krashen's theory of the Natural Approach that states that "[r]eading makes a contribution to overall competence, to all four skills" (Krashen & Terrel, 1983, p. 131).

In other words, reading is a foundation skill that is vital to the development of other skills essential to language learning, so the acquisition of reading skills is a priority for language learners (Levine, Ferenz, & Reves, 2000). Reading instruction, as a consequence, should be provided to language learners as early as possible with the ultimate aim of helping them to achieve reading comprehension, which is specifically the basic goal for ESL/EFL learners to gain an understanding of the texts themselves, enabling them to think about and react to what they read (Tierney, 2005).

In order to foster reading instruction more effectively, reading scholars and researchers such as Grabe & Stoller (2002) and Zhang (1993) suggest that reading instruction be incorporated with collaborative learning, in which students work together in small groups of four to six members. A number of research studies (Koda, 2005; Paris, Wasik, & Turner, 1991) have demonstrated that tasks in collaborative learning offer opportunities for learners to model comprehension strategies while reading. In the same vein, Vaughn and Edmonds (2006) postulate that when students work together collaboratively in a small group, they can read texts and implement reading strategies more effectively. This is because collaborative learning creates an opportunity for students to interact, support each other, which helps them to overcome their comprehension problems (Zoghi, Mustapha, & Maasum, 2010) with teachers as facilitators, not classroom leaders as in traditional teaching.

Based on the tenet that learning can be more effective when students are able to discuss their ideas, experiences, and perspectives with their peers (Gonzalez-Lloret, 2003; Jonassen, Davison, Collins, Campbell, & Bannan Haag, 1995; Pena-Shaff & Nicholls, 2004), it is claimed that collaborative learning (CL) is a learning method in which a small group of students whose members have equal standing can attain

common goals or perform common tasks (Bruffee, 1998), and share meanings relevant to a learning task (Roschelle & Teasley, 1995). Also, with collaborative learning, students have more opportunities for both language input and output through interaction, which consequently maximizes second language acquisition (Fathman & Kessler, 1993; Holt, Chips, & Wallace, 1992; Long & Porter, 1985; McGroarty, 1993). Through collaboration, students have a greater prospect of engaging in a process of meaning construction in which they share ideas and try to create meanings from new experiences using each other's contributions (Jonassen et al., 1995).

Due to its prominent advantages in promoting students' interaction and learning, collaborative learning has gained growing interest during the past two decades in the area of language education; and it has eventually become one of the most researched areas in terms of both learning theory and process for encouraging students' interaction (Barkley, Cross and Major, 2005; Johnson, Johnson & Smith, 1998; Schmuck & Schmuck, 2004).

Collaborative learning, however, is not now restricted to face-to-face classroom settings. The advancement of information and computer technology (ICT) in education has provided tools and avenues for online collaboration to take place in a more efficient way. The Internet, in particular, has transformed society in the way people seek knowledge and interact with information. The rapid growth in Internet connectivity with greatly increased transfer speeds and better protocols for supporting multimedia content have brought the world into the age of the so-called "Web 2.0 generation" (Banister, 2008). Unlike Web 1.0 technology, Web 2.0 innovation integrates social software, such as social networks, wikis, blogs and micro-blogging (e.g. Twitter). These modern social applications allow users to exchange or share

opinions, seek others' feedback, and get connected with others. Such kinds of interaction facilitate social processes and communication, which eventually enable social learning where collaboration is the major emphasis.

Regarding language education, the features of Web 2.0 applications are very promising since they open the door to more opportunities of collaborative interaction between teachers and learners as well as among learners themselves. This also widens the opportunities for students to interact with their teachers and peers in the target language.

Among various Web 2.0 applications in language learning, wikis are one of the most interesting and popular in terms of language learning. Unlike other Web 2.0 applications, such as blogs that are chronologically organized and can be edited by only one person, wikis allow all members to edit, modify, or even remove web pages, so they are often used to promote the creation of collaborative content and editing (Goodwin-Jones, 2003). This empowers members with a sense of ownership and authority promotes student responsibility towards learning in a relaxed collaborative environment (Bold, 2006; Augar, Raitman, & Zhou, 2004) as well as encouraging interaction among students (Beldarrain, 2006). In other words, authorship of a wiki website does not strictly belong to the web creator alone, but is shared among its members, which makes writing seem more of a process than a series of static drafts (Garza & Hern, 2006). These important features of wikis can be beneficial to language learners as they are enabled to brainstorm, share their knowledge, communicate, and discuss topics collaboratively or tasks assigned by the teacher (Bold, 2006). In addition to the afore-mentioned features, wikis are also renowned for

their simple interface and user-friendliness because they are a stand-alone web application that does not require additional special programs.

Due to the special and outstanding features of wikis, research on the application of this Web 2.0 application in language learning has resulted in considerable interest. A number of research studies have confirmed the great benefits of wikis in promoting collaborative learning and language skills, such as writing (McDonald, 2007; Mak & Coniam, 2008; de Paiva Franco, 2008; & Kessler, 2009). Also, some research has proved that wikis have potential benefits in facilitating EFL students' reading (Asazadeh Maleki & Ahangari, 2010; Chang, 2009; Murphy, 2007; Corio, 2009; Verezub & Wang, 2008). Furthermore, wikis have been proved to be an effective tool to promote students' interaction and communication in online group discussions (Chao & Huang, 2007; Godwin-Jones, 2003). From the advantages of this web 2.0 tool as described above, there is no doubt that wikis can be beneficial for English language instruction worldwide, including Thailand.

1.2 Statement of the Problems

In Thailand, where English is taught as a foreign language, the difficulties and sub-standard reading ability of students across different levels of education have been continually reported (Anusornorakarn, 2002; Chinwonno, 2001; Saitakham, 2010; and 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, 2003b). Teachers just assign the reading materials, have the students do the reading activities, and assess their reading abilities

(Dorkchandra, 2010). 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.

Similar to many EFL students at other universities in Thailand, undergraduate students at Suranaree University of Technology, 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 textbooks in English. His findings indicate that most students have a low knowledge of the necessary vocabulary. Likewise, Suppasetseree (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.

In addition to 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 these 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, resulting in a major obstacle to students' effective learning (Hayes, 1997).

1.3 Rationale of the Study

To handle the aforementioned problems and to acknowledge the importance of technology in education, collaborative learning incorporated with the application of technology has been intensively integrated into English courses at SUT in an effort to widen the opportunities for the students to improve their English skills and communication both inside and outside the classrooms. Apart from the normal weekly classroom learning, which lasts for two periods of 50 minutes, another period of 50 minutes per week is allocated to the lesson to allow the students to practise their English skills in language laboratories equipped with powerful personal computers, with the latest software, operational systems and online applications, and high-speed Internet connections (Suppasetseree, 2005). However, after the computer laboratory session, the students can also study out-of-class because a great number of high-quality computers are available to them on campus. For example, there are four computer laboratories in Classroom Building 1 and another four in Classroom Building 2, with nearly one-hundred computers at the Central Library, around 120 computers at the Foreign Languages Learning Unit (FLRU), and more machines in the computer rooms in the student dormitories on campus. Moreover, a lot of technological facilities for education, such as a reliable high-speed wireless internet

service and servers are offered to enhance the efficiency of online teaching and learning. These abundant technological resources can effectively support online language learning which include online collaborative learning at SUT.

Nevertheless, the abundant existing technological infrastructure on the campus itself is not sufficient to guarantee effective online collaborative learning. Other than technological tools, three issues involving challenges of this online pedagogical methodology have been addressed. The first issue involves the misleading perspectives of instructors on the use of technology to promote collaborative learning. Regarding this misconception, Zhan (2008) states that the false impression that students' collaboration will take place automatically when the students are exposed to technology-enhanced collaborative learning will automatically lead to satisfactory learning outcomes could have some potential dangers. such as failure to integrate technology and collaborative learning effectively. This weak conception fails to visualize the process of teaching students' collaboration skills and developing students' collaboration online.

The second issue concerns the ignorance of the importance of instructional system design (ISD) for technology-enhanced instruction. McCormick and Li (2006) postulate that technology may enable new ways of instructional practice; however, its effects depend on pedagogical planning and implementation. With an instructional system design, the instructor brings in his/her pedagogical competence in integrating technology into pedagogical practice to ensure the optimal effects of the technology on instruction (Smeets & Mooij, 2001). In other words, instructional design plays an essential role in directing instructional interventions.

The third issue includes the small body of research on collaborative learning at the tertiary level, especially in the Thai context. Also, research on reading instruction within the framework of online collaborative learning remains under-investigated. Furthermore, very few studies have demonstrated insightful aspects of the process of collaborative learning, i.e. the way students interact and communicate on wikis in order to construct their outputs e.g. solutions to problems, and accomplishment of learning tasks, especially in terms of reading comprehension. Additionally, research works on the application of instructional system design in designing lessons and learning activities for wikis to optimize the use of this Web 2.0 platform, specifically in the area of EFL reading instruction have been very sparse.

These research gaps, consequently, constitute a strong motivation for the present study to address the importance of instructional system design for effective online collaborative learning using wiki to support reading instruction, to explore the process of students' collaboration, and to optimize the use of wiki to facilitate students' collaboration in the university context in Thailand.

1.4 Objectives of the Study

The objectives of the present study are:

1. to develop a Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model) to promote students' collaborative discussions and interactions in carrying out reading tasks for EFL university students at Suranaree University of Technology,

2. to determine the efficiency of Wiki-based Collaborative Reading Lessons (WCR Lessons) based on the 80/80 standard for EFL university students at Suranaree University of Technology,

3. to investigate the effects of Wiki-based Collaborative Reading Lessons (WCR Lessons) on students' reading achievements,

4. to examine the students' interaction to accomplish reading activities through Wiki-based Collaborative Reading Lessons (WCR Lessons), and

5. to explore students' level of satisfaction with Wiki-based Collaborative Reading Lessons (WCR Lessons) to improve their reading comprehension.

1.5 Research Questions

To achieve the purposes stated above, the study aims to address the following questions:

1. What are the components and logical steps in developing a Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model)?

2. Does the efficiency of Wiki-based Collaborative Reading Lessons (WCR Lessons) improve students' reading comprehension in order to achieve the 80/80 standard?

3. What are the effects of Wiki-based Collaborative Reading Lessons (WCR Lessons) on students' reading comprehension?

4. How do students interact among themselves to complete the learning activities in Wiki-based Collaborative Reading Lessons (WCR Lessons)?

5. What is the students' level of satisfaction with Wiki-based Collaborative Reading Lessons (WCR Lessons) to improve their reading comprehension?

1.6 Significance of the Study

The present study will contribute to the field of EFL reading pedagogy and online collaborative learning in various ways. Firstly, it is expected to provide a framework in designing instructional models to enhance students' interaction in an online collaborative learning environment. The WCR Instructional Model will also serve as a guideline for the effective integration of collaborative learning with EFL reading instruction through the use of an online application, especially Web 2.0 tools like wikis to assist students to interact with peers to co-construct their understanding of English reading passages. Moreover, the instructional model also provides a method for monitoring and investigating students' collaboration during collaborative activities, which will be beneficial to teachers or online instructional designers who will be able to adapt it to their contexts.

Secondly, the lesson plan of this study will contribute to the field of online reading instruction about the process of learning and conducting collaborative group work reading activities for EFL university students. The lesson plan was carefully designed and revised several times in order to fit the principle of collaborative learning. Due to the fact that students' collaboration cannot take place without careful instructional design, reading activities in WCR Lessons were tried out and improved until they proved that they could effectively promote interaction among students.

Furthermore, the lesson plan also presents a clearly explained step-by-step guide of how to monitor and encourage students' interaction during collaborative activities.

In addition, WCR Lessons can provide an example of how to turn a traditional teacher-led classroom into a more student-centered activity, which makes learning more interesting and challenging. Furthermore, WCR Lessons will give the students a greater sense of responsibility because most of the activities, such as out-of-class group discussion assignments which require the involvement of every member of the group even when they are outside the classroom or class time.

Moreover, it is also expected that WCR Lessons can provide an example to instructors of the use of wikis, as a free online website, which can be used to teach other areas of language teaching than writing, to which a great deal of research has been addressed. Hopefully, the present study will present a different perspective on the effective implementation of this Web 2.0 application in teaching EFL reading skills.

Additionally, the present study was carried out with large undergraduate online classes (95 students); therefore, the results of the experiment will provide insights to online course designers and instructors as to how to employ collaborative learning approaches and online lessons like WCR Lessons to teach large classes, where students normally have limited exposure to language use or active roles in participating in the class. WCR Lessons will offer wider opportunities for them to get more involved with the lessons and learning activities, which can increase their motivation to learn, and could eventually lead to higher learning achievements.

Next, the findings of the present study will reflect insights into the relationships between the students' processes of collaborative interaction and other

essential factors, such as the amount of teacher's facilitation and students' interpersonal relationships that play an important role in the amount of students' interaction, which consequentially has an influence on their learning outcomes. This will help online instructors to consider how important the teacher's role as a facilitator is and also how important the interpersonal relationships between students are in a collaborative group in an online collaborative learning context. Moreover, the findings also strongly suggest that students' collaboration may not take place effectively without the teacher's involvement.

Finally, the present study will hopefully motivate language teachers to use computer-mediated communication (CMC) technology, in this case the wiki, to promote students' use of the target language either as in-class activities or out-of-class activities. The findings from both the interview and the questionnaire of this study reveal that most of the students felt that they had used the language more in online discussion than they did in the normal classroom. This was because they experienced lower anxiety in an online environment. This finding confirms that online computer-mediated communication, either synchronous or asynchronous type, could be another promising channel to promote students' communication in the target language, which would consequently help them improve their language skills.

1.7 Definitions of Key Terms

80/80 Standard: a benchmark criterion for the evolution of the efficiency of lessons in the proposed online collaborative learning via wiki. The 80/80 standard is represented by the symbol "E_1/E_2", where E_1 (the former 80) represents the efficiency

of the learning process as a percentage, and E_2 (the latter 80) represents the efficiency of the learning product (Brahmawong, 1978).

Collaborative Reading: reading activities and lessons that students perform through collaborative discussions with peers in small groups in order to induce meaning from the text and facilitate reading comprehension.

EFL University Students: undergraduate students at Suranaree University of Technology who enrolled in English III Course in trimester 2/2013.

Interaction Analysis Model (IAM): a rubric to measure the quantity of students' online interaction developed by Gunawardena, Lowe, and Anderson (1997). IAM places its primary focus on cognitive levels of interaction, which are divided into five cognitive phases ranging from lower to higher levels.

Index of Item-Objective Congruence (IOC): a procedure, originally developed by Rovinelli and Hambleton (1977), who used it in test development for evaluating content validity at the item development stage, in which at least three experts are involved in the evaluation. The limits of this index range from -1.00 to +1.00, with +1.00 indicating that the item perfectly meets the objective, 0 indicating that the evaluator is undecided, whereas -1.00 means the item definitely does not respond to the objective (Waltz & Jenkins, 2001).

Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model): a systematic approach for implementing the instructional design process describing how collaborative reading instruction is systematically performed on a wiki.

Reading Comprehension: the process of simultaneously extracting and constructing meaning through interaction and involvement with the written language.

Satisfaction: a state of feelings and perceptions of the student regarding the wiki-based collaborative reading lessons.

Students' Interaction: The cognitive process in online discussion between one student and other students in a collaborative group, with or without the online presence of an instructor.

Teacher's Facilitation: The online teacher's involvement during students' online interaction in order to facilitate them when they have problems with doing reading activities, and to encourage passive students to participate more actively in group discussion.

Web 2.0: the second generation of Internet technology that serves as a source for providing information to an interconnected community, in which all community members create and share knowledge. Common Web 2.0 applications include web blogs, wikis, and social networking websites, such as Facebook, twitter, and Google Plus.

Wiki: 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.

Wiki-based Collaborative Reading Lessons (WCR Lessons): reading activities and lessons in which students work together through small group discussions and interaction to accomplish reading tasks on wiki. WCR Lessons were designed in accordance with the contents of "Read This! 2," a commercial course book for English III at Suranaree University of Technology. The online lessons were comprised of four units with various collaborative activities.

1.8 Summary

In summary, the researcher has provided the general background concerning language learning in Thailand and at Suranaree University of Technology, and the rationale for conducting this study. Also, the research questions, the expected contributions of this research, and some practical limitations of the study have been discussed. The next chapter will be a discussion of the related literature and theories regarding the design of an instructional model for the present study.
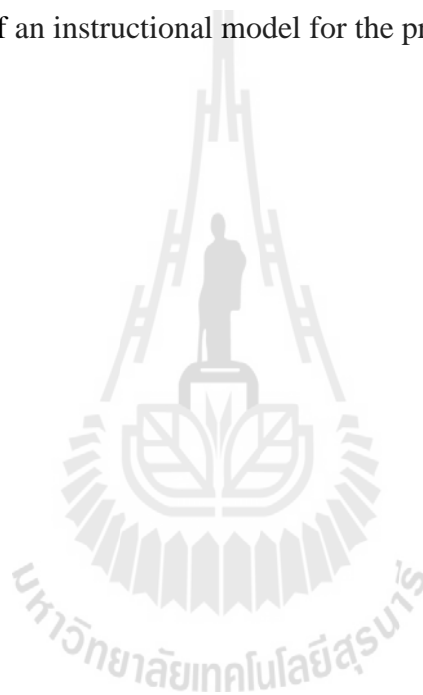
CHAPTER 2

LITERATURE REVIEW

This chapter aims to present a review of the literature, theories, and research studies related to EFL reading, reading strategies, collaborative learning, interaction, and the use of a computer-supported collaborative learning tool called "wikis" to support students' collaboration. Also it aims to provide a detailed discussion about instructional system design, which is a key element in designing the online instructional model. Finally, a brief account of related research studies on the use of wikis and collaborative learning in language instruction will be presented.

2.1 Definitions of Reading

Prior to getting into the deeper details of reading strategies, an understanding of some basic definitions of what reading means is recommended because it seems that reading is not completely understood and has been given various definitions (Aebersold & Field, 1997; Taverner, 1990; Urquhart & Weir, 1998). This is possibly because reading deals with "the most intricate workings of the human mind" (Huey, 1908). However, some definitions of reading by researchers and reading scholars are presented here.

In the view of Goodman and Goodman (1979), reading is a psychological guessing game is which the reader has constructed his hypothesis prior to reading and makes his best efforts to interpret the message encoded by the writer. This is called top-down information processing (to be discussed later in the following section).

Similarly, Harris and Sipay (1980) hold that reading is a complex system involving the recognition and comprehension of written symbols which is influenced by readers' perceptual skills, decoding skills, experience, language backgrounds, and reasoning abilities as the reader anticipates meaning on the basis of what has been read.

Another definition of reading is proposed by Kennedy (1981) who sees reading as the ability of an individual to recognize a visual form and to associate it with sound and meaning using his own experience. Hood and Solomon (1985), define reading as an active process in which lexical and linguistic knowledge must be employed in order to interpret the printed text.

In the view of Alderson (2000), reading is the interaction between a reader and the text. Consistent with this view, Grabe (2002) refers to reading as the ability to derive understanding from written text. In the same line, Grabe and Stoller (2002, p. 17) postulate that reading is the ability to understand information in a text and interpret it appropriately.

From the definitions of reading provided above, it will have been noticed that reading has been defined differently according to various perspectives. However, these definitions converge on to a common ground, which is that reading is a complex process in which a reader employs his prior knowledge, language abilities, and reading techniques in order to comprehend the text he interacts with, which is the ultimate goal of reading.

2.2 Models of Reading

People read in order to extract meaning from texts they are engaged with. When reading is in process, models of reading are often involved. Models of the

reading process often demonstrate the act of reading as a communication activity between the writer and the reader. According to Barnett (1989), there are three types of reading approaches: the bottom-up, the top-down, and the interactive. The three models of reading will be discussed in this section.

2.2.1 The Bottom-up Model

During the pre-1960s, when behaviorism was dominant in language teaching, most research in reading was influenced by the behavioristic approach.   Most theories about reading and reading models were under the concept of behaviorism that rejected mentalism in psychology with more emphasis on the observability of data. Therefore, events or behaviours that could not observed, such as reading comprehension, were overlooked.

In the view of behaviorism, reading was a process of decoding orthographic signals into mental linguistic codes (Ellis, 1985, 1994; Pearson & Stephen, 1994). This approach to reading focussed on the form and language structures of the printed texts. The tests were then linguistically analyzed into small components with different levels of processing, namely, *letters* at first level; *words* at the second level; *sentence* at the third level; and finally *text* at the fourth level. The act of reading was considered to be linear. The process of perception starts from letters, words, sentence, and text, respectively. Therefore, from the point of view of behaviorism, reading was considered as translating visual input (letters) on a printed page into an oral code (sounds of the letters) (Pearson & Stephen, 1994). Reading comprehension was conceptually considered as being able to remember the text (Brown, 1997). This linear and serial process in approaching reading comprehension is called the 'Bottom-up approach'

since it starts from the smallest part of the text, i.e. the letters, and ends up with the largest part, the text itself.

In this approach, the bottom-up model, therefore, describes the reading process as linear and unidirectional, starting from building symbols into words, words into sentences and sentences into general knowledge. A number of bottom-up reading models have been proposed. Gough (1972), for example, presented a reading model called "One Second Model of Reading," which consists of a series of five main stages: the Scanner, the Decoder, the Lexicon, the so-called Merlin, and the Editor. In this model, reading starts when the Scanner scans visual input for known letters and passes the information to the Decoder, which converts the visual code into its equivalent phonological code. The phonological trace is, then, transformed into words with the help of the Lexicon. The information is, then, processed to the so-called Merlin where the meaning and the grammatical structure of the complete sentence are analyzed. After that, the processed input is passed to the Editor to convert the semantic code into muscle contractions capable of driving the muscles of the articulatory system. In line with Gough, Stanovich (1980) proposes that information processing flows in a series of discrete stages, starting with recoding the printed input, and working up from the lower to the higher levels of processing.

Another model called Automatic Information Processing Model, in which the bottom-up approach was applied, was presented by LeBerge and Samuel (1974). In this model, reading is considered to be a process of decoding from bottom to top, from part to whole, from surface to deep, and from external to internal.

The bottom-up models, in general, attempt to present a logical explanation of what happens while reading, starting from a small unit to a larger one. Yet, this model

seems to overlook the importance of reading comprehension since the main focus is on the understanding of linguistic knowledge rather than reader's schema, i.e. related cultural background and meaning of the text in the whole. Besides, findings from later empirical research have raised questions about the linear unidirectional nature of the model for a number of reasons. For instance, the bottom-up reading model fails to explain how the meaning of the word and/or the meaning of the sentence is affected by the context in which it appears. In fact, while the readers process the text more than mechanical decoding is taking place, and they also show the use of syntactic knowledge in dealing with unknown words, suggesting that the reading process cannot be a linear progression from lower to higher levels of processing. In spite of this inadequacy, the model accounts for the active role of the readers in using their knowledge about the rules of the language in decoding the text.

2.2.2 The Top-down Model

In the 1960s, a number of problematic points concerning the bottom-up approach were identified, while interest in research into the constructive role in reading was blooming. Researchers began to realize that reading was not as text-driven as it had been viewed in the behaviorism-based bottom-up approach. Researchers in the field of reading have observed that while the visual input plays an important role in reading comprehension, the non-visual information stored in the reader's mind plays an even greater role in reading comprehension (Goodman, 1970; Smith, 1985). The growing interest of constructivism in reading has led to the development of a new approach to reading comprehension named "the top-down approach." Reading research based on this approach has signified a shift of the focus of reading research from text-driven to data-driven or reader-driven models (Carrell, 1988; Klein, 1988).

Based on the top-down approach, readers set hypotheses about words they are going to encounter and they use only just enough visual information to test their hypotheses (Goodman, 1967; Smith, 1971). In the view of Goodman, reading is a psycholinguistic guessing game. He asserts that the goal of reading is to construct meaning from text with the use of sound-symbol correspondences, syntactic and semantic cues. He also adds that readers normally do not read every word they encounter, but rather scan through the text in order to guess the meaning of the words or phrases. Though this view of guessing is at the lower level of letter and word recognition rather than an overall one, it emphasizes that readers contribute to meaning more than the printed text does. Smith (1985) adds that reading comprehension depends on two kinds of information: (1) visual information, which is perceived through the printed text or symbols; and (2) non-visual information, which is already obtained by the reader's understanding of the relevant language, background knowledge of the subject matter, and their general ability in reading. He asserts that the relationship between visual and non-visual information is inverse. In other words, the more visual information the reader perceives, the less non-visual information is needed to comprehend the text, and vice versa.

In this approach, reading is not viewed as decoding the orthographic forms into sound signals as suggested in the bottom-up approach. Reading, on the other hand, is treated as a process that begins with what the reader already knows, not the visual input from the text (Devine, 1986). Since the top-down approach to reading relies mainly on reader's schema in reading, this can be one of its major drawbacks. If the reader is reading topics which are completely new to them, it is inefficient, impractical and perhaps impossible to make predictions about their reading.

2.2.3 The Interactive Model

While the bottom-up model of reading views reading as a linear process, proceeding from letters to words, words to sentences, and from sentences to text, in the top-down process, by contrast, the reading process starts from already-known information stored in the reader's mind to construct the meaning of the text. Some reading scholars, however, believe that effective reading in either L1 or L2 requires both the bottom-up and top-down approaches operating interactively (Carrell, 1988). Goodman (1981) states that while reading, the reader uses print as input and produces meaning as output. However, the reader also forms input as well. He interacts with the text and uses a some of the cues of the text selectively as necessary to construct meaning. Likewise, Rumelhart (1994) asserts that successful reading is a perceptual and a cognitive process as well as being a process of interaction among various sources of information. He also adds that reading is a process of understanding written language. This process starts when the eyes meet the printed text, and ends when the reader constructs the meaning and perceives the idea of what the author intends to convey. To achieve this, readers, especially skilled ones, must be able to employ sensory, syntactic, semantic, and pragmatic information interactively to carry out their reading task.

The view about reading as an interactive process is well described by the Rumelhart (1977) Model, which is illustrated in Figure 2.1. In this model, reading begins when visual signals or graphic inputs are perceived and stored in a Visual Information Store (VSI). The information is then extracted for relevant features by a Feature Extraction Device, and forwarded to a Pattern Synthesizer. The Pattern Synthesizer, then activates Syntactical Knowledge, Semantic Knowledge, Orthographic Knowledge, and Lexical Knowledge to process the obtained visual information, and

consequently produces the most probable interpretation. This process enables higher-level processing to influence lower-level processing. This model emphasizes that the reading process is the result of the parallel application of sensory and non-sensory sources of information.
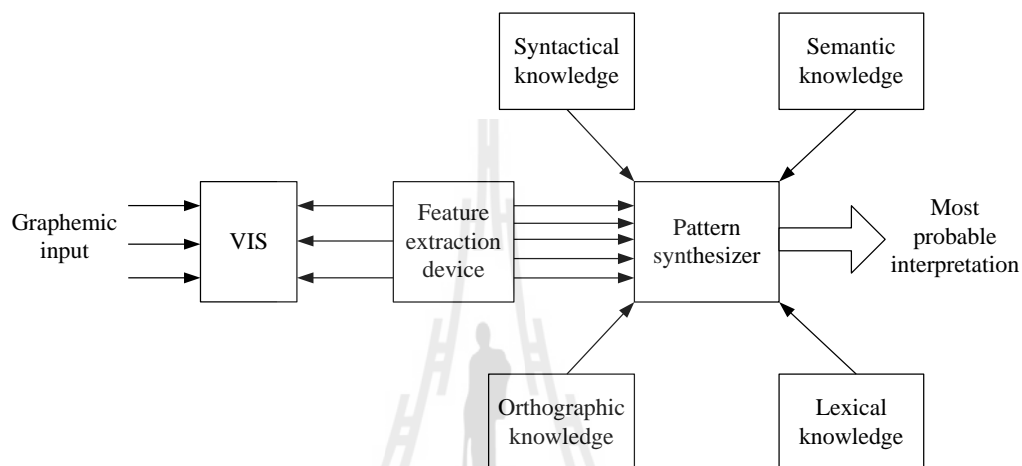
Figure 2.1 Rumelhart (1977) Model of Reading

Another influential interactive model of reading was introduced by Stanovich (1980) who argues that readers are dependent on the concepts of both the bottom-up and top-down approaches simultaneously as well as the reading purpose, motivation, schema and knowledge of the subject. His model is basically constructed on the same basis as Rumelhart's but with the addition of a "compensatory mode" together with interaction with both bottom-up and top-down processing.

The Stanovich model holds that a key concept is that a process at any level can compensate for deficiencies at any other level of reading. Another essential idea for this model is that the interactive models of reading are based on the assumption that the input information is synthesized simultaneously from several sources of knowledge

(Syntactical Knowledge, Semantic Knowledge, Orthographic Knowledge, and Lexical Knowledge, as in Rumelhart's Model). If there is a deficit in any knowledge source, then the rest of the knowledge sources will communicate with each other to solve the problem. In other words, the rest of the knowledge sources will compensate one another. With this feature, Stanovich's Model is alternatively called the "interactive-compensatory reading model."

From the discussion of the two interactive reading models above, it can be concluded that it is not too difficult to infer from the model that the visual inputs, the reader, and the context for the reading are all involved. One vivid point that the two interactive reading models have in common is the inclusion of the reader's background knowledge in facilitating the construction of meaning from the printed text.

In summary, on the basis of reading research studies which aim at setting up a model-building framework, three reading models have been proposed: the bottom-up approach, the top-down approach, and the interactive approach.

2.3 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).

The following are some examples of definitions of reading strategies given by researchers and scholars in reading. 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. Garner (1987) defines reading strategies as an action or series of actions employed in order to construct meaning. Likewise, Abbott (2006) 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, on the one hand, can be conscious actions that learners take to improve their language learning such as note taking; on the other hand, they can refer to mental process (unobservable) such as the use of one's background knowledge 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.

2.4 Reading Comprehension through Collaborative Learning

In terms of foreign language learning, there are basically two methods available: one method that promotes the effectiveness of learning whereas the other method

promotes learning as an activity to enhance learners' comprehension. The former is related to learning strategies in the context of second language learning, and the later is associated with learning in terms of reading strategies which focus on how readers elaborate a task, how they make sense of what they read, and what they should do when they do not understand what they read. It means that this method can be applied by readers for improving their understanding and solving their comprehension problems.

Teachers of EFL have opportunities and must take account of pedagogical considerations in selecting which method would be more effective for promoting higher levels of achievements in the reading comprehension process. Commonly, there are at least two options that can be selected by teachers to make students learn and interact in terms of a reading comprehension class. Firstly, they can manage their reading class in an individual learning situation, so that the students will be involved in the reading activity individually at their own pace and using their own methods. Secondly, they can set up the class in a collaborative learning situation by assigning the students to work together in small groups regardless of diversity in terms of ability and background. Which options are more effective than others in terms of reading comprehension achievements, still need to be examined more deeply.

Reading comprehension through collaborative learning denotes a reading activity for which students need to work together in small groups to support each other to comprehend the text individually. Each member of the group has a different role and responsibilities in order to achieve the common goal in understanding the text. Using the collaborative learning method means that teachers compose their teaching using specific methods in which students at different levels work together in small groups to achieve one main purpose. In the group, students are individually responsible for

assisting each member of the group and to support each other in learning (Johnson and Johnson, 1989).

By focusing on studies of the effectiveness of collaborative learning techniques related to EFL reading comprehension achievements, Jalilifar (2010) obtained contradictory findings on this issue. On the one hand, there was sufficient evidence that students' achievements were higher in the collaborative group compared to the traditional class taught by means of traditional methods. On the other hand, research findings from Bejarano (1987) and Rapp (1991) imply that collaborative learning methods do not have significant or positive effects on achievement in reading comprehension skills. Similar findings were obtained by Shaaban (2006). In his experiment, which focuses on an EFL vocabulary and reading class using a collaborative learning method, he did not find that collaborative learning (in general and particularly in the use of the jigsaw method) is more effective in increasing vocabulary acquisition and reading comprehension than whole class instruction by the conventional method.

There are some possible reasons to explain why collaboration between students did not have a significant impact on the students' reading comprehension. The main reasons are related to a lack of knowledge of collaborative procedures, low levels of students' motivation, learning materials, background knowledge, learning strategy and or meta-cognition strategy (Cubukcu,2008). Regarding collaborative reading comprehension, teachers also need to give students explicit explanations about text comprehension strategies before they carry out a collaborative reading activity in order to obtain a more significant effect. The strategies of identifying main ideas, summarizing, guessing meaning, and inferencing have been found to be helpful to enhance students' reading skills.

Taking collaborative learning as a key element of this proposed study, its definitions, basic elements, and its pedagogical practices will be discussed in detail in the following section.

2.5 Collaborative Learning

Collaborative learning (CL) is a kind of instructional method in which students work together in small groups to accomplish a task. This teaching method is different from normal traditional classroom situations. According to Johnson, Johnson, and Holubec (1994), once a task is assigned in the classroom, three learning situations, namely, competition, individualism, and cooperation tend to arise.

In a competitive situation, individual students try to perform their best in order to go faster and get better scores than their classmates. They realize that "they can obtain their goals if and only if the rest of their classmates fail to achieve their goals" (Johnson and Johnson, 1999). Coakley (1994) asserts that competition is "a social process that occurs when rewards are given to people on the basis of how their performances compare with the performances of others doing the same task or participating in the same event." Undoubtedly, competitive learning does bring excitement to class; however, it requires that success comes from the failure of another. Therefore, the atmosphere in the classroom could become very strained and unfriendly.

Regarding individualistic situations, students carry out the task individually. In this setting, students' aim of learning is to achieve their goal independently with the primary concern being placed on their individual results, and not on the results of others. It is also based on the belief that knowledge and cognitive skills are assets that a teacher can transfer to the learner (Saloman & Perkins, 1998). Individualism, as a result,

lacks connection between the goal of individual learning and the rest of the class (Johnson & Johnson, 1991) and it is more likely to be a teacher-centered approach.

The third situation, collaboration, is in contrast to the latter two teaching methods. In collaborative learning, students help and support each other to carry out a task. This type of leaning is based on joint actions to accomplish mutual goals. Therefore, the success of the group will be the success of individual students as well (Johnson & Johnson, 1994).

In most learning situations, students come to class with a wide diversity of skills and knowledge, so competitive and individualistic approaches of teaching could be a danger to students' motivation as well as to their self esteem, especially to low achievers (Slavin, 1995).

Moreover, compared to the former two instructional methods, a considerable number of research studies has revealed that collaborative learning can have positive effects on students' learning in many aspects, such as motivation and self-esteem, attitudes towards the subject matter, lower anxiety, and strengthened social relations (Burron, James, and Ambrosio, 1993; Lazarowitz & Karsenty, 1990; Nichols & Miller, 1994; O' Donnell, Dansereau, Hall, & Rocklin, 1987; Sharan & Shaulov, 1990; Slavin , 1987, 1991).

To fully understand the underlying concept of CL, discussions about its definitions, basic elements, foundation theories, and its application in language learning and teaching will be presented in the following sub-sections.

2.5.1 Definitions of Collaborative Learning

As mentioned earlier in this chapter, collaborative learning (CL) is an instructional approach based on the philosophy that students learn effectively when they

are engaged in small groups. However, the terms group work and CL are not synonymous; they are pedagogically different in some ways. Cohen (1994) explains that group work refers to the situation where students are assigned to work together in groups in order to carry out a given task. However, students' contributions, participation and learning in group-work activity may be unequal; and there could be a potential problem called "free-riders" or students who do not take part in doing the task at all (Giraud & Enders, 2000; Magney, 1996). Collaborative learning, on the one hand, is similar to group work in that students help each other carry out a given task or create a product; on the other hand, they are held responsible for one another's learning as well as their own. The success of every single member is the true success of the group.

There are numerous, yet similar, definitions of CL given by advocates and scholars whose works are predominantly involved in developing this teaching approach. In the view of Slavin (1982), CL is a kind of instructional method that allows students at all levels of proficiency to perform tasks together in small groups in order to reach a common goal by sharing ideas and being responsible for their teammates' learning as well as their own.

In line with Slavin, Johnson et al. (1994) refer to CL as an instructional method in which students work together to maximize their own as well as others' learning. In this setting, students are arranged to work in small groups to solve a particular task assigned by the teacher. In the group, students take responsibility for each other's learning on the basis of the philosophy that it is to everyone's benefit that every member in the group should succeed.

Likewise, Olsen & Kagan (1992) define CL as group-learning activities organized so that exchanges of opinions and information among students in groups can

take place in a socially-structured manner. Also, each group member is held responsible for his/her own as well as others' learning.

Davidson (1990) proposes seven points to define CL as being: a) a task for group completion, discussion and resolution; b) promotive interaction in small groups; c) an atmosphere of cooperation and mutual helpfulness within each group; d) individual accountability; e) heterogeneous groupings; with an emphasis on explicit instruction of collaborative skills; and f) structured mutual interdependence.

Vermette (1998) refers to CL as a classroom team of a relatively permanent, heterogeneously mixed, small group of students who have been assembled to accomplish a given task, create a series of projects or products and/or who have been assigned to take full responsibility in constructing knowledge individually. The spirit within the team has to be one of positive interdependence, that is, a feeling that success for an individual member in the group is bonded to the success of other group members.

To summarize all the opinions and definitions mentioned above, collaborative learning is an instructional approach that emphasizes conceptual learning and the development of social skills as learners work together in small heterogeneous groups in accordance with the following conditions (known as basic elements of CL), namely, the principles of positive interdependence, individual accountability, face-to-face interaction, and group processing that lead to achievement of a shared goal, in which true success of individuals is achieved upon the success of all group members.

2.5.2 Basic Elements of Collaborative Learning

As mentioned earlier in this chapter, collaborative learning is distinguished from other learning approaches by its basic elements, which are described by researchers and scholars in a similar way.

Johnson and Johnson (1989); and Johnson, Johnson, and Holubec (1998) propose that CL is underpinned by five basic elements, namely, positive interdependence, promotive interaction, individual accountability, and interpersonal and small group skills.

2.5.2.1 Positive Interdependence

Positive interdependence is the belief by each individual that there is value in working with other students and that both individual learning and work products will be better as a result of collaboration, as Johnson et al. (1998) explain it, there is a positive interdependence which bonds students together so the sense of individual success is not fulfilled unless all the group members succeed. Group members have to know that they sink or swim together. In this sense, students in the group must perceive that they need each other to carry out the task. This can be achieved by establishing a common goal; allocating complementary roles; sharing resources and materials; and sharing joint rewards. Smith (1998a) suggests that positive interdependence be promoted prior to assigning students work so that every student has a sense of his or her responsibility for learning the assigned materials and also for ensuring that all the members of the group learn it as well.

2.5.2.2 Promotive Interaction

Promotive interaction is a result of positive interdependence. Promotive interaction may be defined as individual students orally encouraging and facilitating each other's efforts to achieve, complete tasks, and produce in order to reach the group's goals (Roger & Johnson, 1994). CL and promotive interaction among students is hardly separable. Verbal interchange and interaction patterns among students are essential. An exchange of ideas helps students understand each other.

Johnson and Johnson (2005) emphasize that it is necessary to maximize the opportunities for the students to help, support, encourage, and praise each other by means of oral explanations in solving a problem, sharing one's knowledge with others, checking for understanding, providing oral feedback, and discussing the concepts being learned.

2.5.2.3 Individual Accountability

Vygotsky's (1962) aphorism "What children can do together today, they can do alone tomorrow," truly describes this third element of CL. Individual accountability is the measurement of whether or not each group member has achieved the groups' goal and also the assessment of the quality and quantity of each member's contributions and giving the results to all group members (Johnson et al., 1998). In this account, performance of individual students is assessed by the teacher, and the results are reported back to the individual and the group. This will enable group members to monitor each other as well as to evaluate who needs more assistance, encouragement, and support in order to achieve the goal of the given task. The process by which peers provide support to one another is called "scaffolding," which is to be discussed later in this chapter.

To ensure that students are individually accountable, it is advisable that the teacher keep the group size small, optimally between two to six members (Slavin, 1986); and have each student take some tests individually, either through an oral or a written format. It is also suggested that the teacher should observe each group to evaluate an individual's contributions to the group work, and also have the students teach or share what they have learned to other members in their groups.

2.5.2.4 Interpersonal and Small – Group Skills

The next key element of CL directly deals with social skills, which are interpersonal and small group skills. In order to coordinate efforts to achieve the mutual goals of the group, students need to be trained to ensure that they understand and are able to use the following social skills: 1) getting to know and trust each other, 2) communicating accurately and unambiguously, 3) accepting and supporting each other, and 4) resolving conflicts constructively (Johnson, 1990, 1991; Johnson & Johnson, 1991). Schultz (1999) adds that these social skills should be explicitly taught to the students, so that they can work among themselves, not only in terms of cooperation, but also without hostility and without the teacher's authority.

Additionally, it is advisable that the teacher provides a token of reward when each member of the CL team demonstrates a high percentage of the social skills in class to motivate the students to utilize those skills more (Johnson, Johnson, & Smith, 1991).

2.5.2.5 Group Processing

The last important element of this teaching approach is called group processing, which is, in fact, a sub-branch of the former element—interpersonal and small-group skills. Group processing is a means to determine whether the goals are achieved and to maintain effective working relationships among members (Siciliano, 2001). Similarly, Johnson and Johnson (1991) explain that group processing can be performed as reflective feedback on the following issues: a) what group actions were helpful and unhelpful, and b) making decisions about which actions to maintain or change. Therefore, the purpose of this learning element is to envision and improve the effectiveness of the individual members in contributing to the collaborative efforts to

reach the group's goal. The five basic elements of CL are inter-associated, as illustrated in Figure 2.2 below.
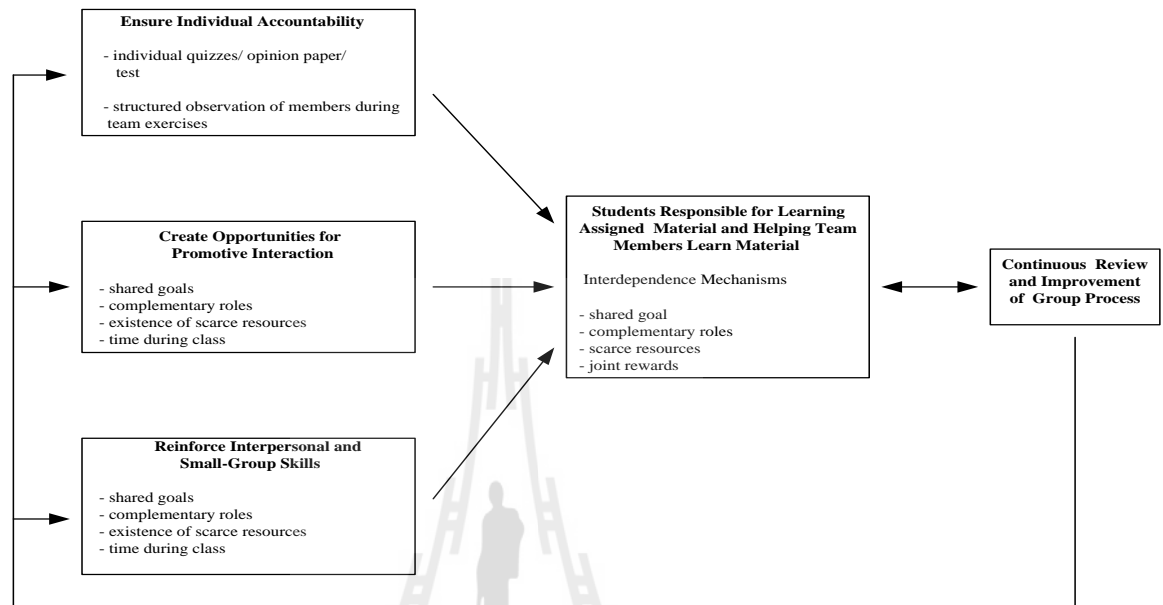
Figure 2.2 Relationship between the Elements of Collaborative Learning

2.5.3 Fundamental Theories of Collaborative Learning

This section aims to provide a clear picture of the foundational theories concerning CL. According to most of the collaborative research studies, CL stemmed from socio-constructivism which branched out into two major constructivist approaches, namely, socio-constructivism and social-cultural constructivism (O'Malley, 1995; Pishghadam & Ghadiri, 2011; Dillenbourg, Baker, Blaye, & O'Malley, 1996).

2.5.3.1 The Socio-Constructivist Approach

This approach is derived from Piaget's concepts in cognitive development, which mainly focuses on individual aspects in cognitive development. The core concept of this cognitive approach is that the development of individual intellect proceeds through adaptation and organization. Piaget holds that cognitive development is

characterized by expanding equilibration—a balance between what one knows and what one is experiencing. Equilibration is achieved through a process of assimilation and accommodation. Assimilation is a process of taking in external events or information into one's previous schema whereas accommodation involves restructuring one's existing schema or ideas, as a result of new information; if the new data make sense to the existing schema, then the new information is incorporated into the structure (Wankat & Oreovicz, 1992). Assimilation and accommodation are closely interwoven, so they are inseparable.

In the 1970s, a group of psychologists called "the Genevan School" adapted this individual cognitive approach to their studies in investigating the effects of social interactions on individual cognitive development (Doise & Mugny, 1984). Since then, Piaget's cognitive approach has been widely adopted in many social interaction studies, which later formed a new approach called "socio-constructivist." This modified approach views cognitive development as a result of a cycle of causality. A given level of individual development allows participation in certain social interactions which produce new individual states which, in turn, make it possible for that person to have more complex social interactions.

In a CL context, students are required to work together with peers, and they stand a chance to experience a cognitive conflict. Such a conflict, called socio-cognitive conflict, can promote students' discussions and interactions about solving problems (Vedder & Veendrick, 2003). Once students are engaged in discussions, socio-cognitive conflicts take place, then disequilibration arises, and finally understandings emerge (Johnson et al, 1993; Slavin, 1996).

2.5.3.2 The Socio-Cultural Approach

Socio-cultural theory was first proposed by Vygotsky (1962, 1978) and later supported by other advocates of this theory, for instance, Wertsch (1985) and Rogoff (1990). While the Piagetian socio-constructivist approach emphasizes individual development in the context of social interaction through conflicts and controversy, Vygotskian socioculturalism places the focus on the causal relationship between social interaction and individual cognitive reconstruction (Dillenbourg, et al., 1996).

From Vygotsky's perspective, social interaction is a prerequisite to cognitive development. He argues that "[a]n interpersonal process is transformed into an interpersonal one. Every function in the child's cultural development appears twice; first on the social level, and later on the individual level; first between people (inter-psychological), and then inside a child (intra-psychology) (Vygotsky, 1978, p. 57). This interpersonal process is referred to as Vygotsky's "genetic law of cultural development."

Taking socio-cultural approach into CL account, cognitive development is encouraged when individuals have social interaction with more knowledgeable people in a zone of proximal development (ZPD). Vygotsky (1978) defined the term ZPD as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers." With this perspective, some scholars argue that peers with equal or lower capability can also assist ZPD. Van Lier (1996), for instance, asserts that in some particular contexts, it is more beneficial for language learners to have conversational interactions with peers of similar or less proficiency than to interact with peers of more ability or with native

speakers, for it can allow the creation of different kinds of contingencies and discourse management strategies.

To facilitate learners in the process of ZPD, teachers are expected to scaffold learners to actualize their potentialities. Wood, Bruner, and Ross (1976) define the terms "scaffolding" as metaphorical terms drawn from the process of building construction. Once the construction is near to finishing, scaffolding is gradually removed. When applied to learning, this term will mean that helpers gradually remove the support provided to learners as the learners get closer to being able to carry out the task on their own. In other words, "scaffolding" refers to supportive behaviors, chosen by an expert in cooperating with the novice learner, which facilitates the learner to achieve the learning task or goal (De Guerrero & Villamil, 2000).

In the socio-cultural view, learning is embedded in social events and occurs as an individual interacts with other people, objects, and events in the environment. The learner's cognitive development is influenced by social interactions, cultural activities he/she has experienced (Oxford, 1997), and enhanced through the process of scaffolding (Ellis, 2004).

To sum up, the two constructivist-oriented approaches— Piagetian socio-constructivism and Vygotskian socio-culturalism, have played a dominant role in the context of CL and teaching, in spite of their contrasting ideas. Piaget holds the belief that learning is a phenomenon as a result of individual mental and physical maturation as well as experience. In other words, cognitive development precedes learning. However, Vygotsky argues that it is the learning processes that lead to cognitive development. He suggests that learning and development are socio-cultural activities in which people are engaged with each other. It is external and social rather than an

internal and individualistic process. Despite being slightly contrasted, both independent theories complement each other in the collaborative classroom in that Piagetian socio-constructivism promotes active learning while Vygotskian socio-culturalism encourages social interaction in learning.

To illustrate a clear picture of how collaborative learning leads to language learning, it is necessary to discuss the relationship between second language acquisition and this approach to learning, which will be discussed in the next section.

2.6 Second Language Acquisition and Collaborative Learning

Second Language Acquisition (SLA), as the name implies, is the process of how people learn and acquire a foreign or subsequent language in addition to their native language. The term "language acquisition" was introduced to the field of language learning research by Krashen (1982) after he proposed the distinction between "language acquisition" and "language learning". He argues that language acquisition involves a subconscious process in which learners need to be engaged in meaningful interaction and natural language communication in order to convey meaning and extract language rules rather than its structures. On the other hand, language learning concerns the instruction and the understanding of grammatical rules through error correction. This acquisition-learning differentiation has provided a clearer picture of how natural learning contexts and language use play important roles in second language acquisition (Pérez, 2008). This distinction, consequently, made Krashen's SLA theory become predominant in the field of language pedagogy during the 1980s.

According to Jacobs and McCafferty (2006), SLA theories in association with CL include the input hypothesis, the interactional hypothesis, the output hypothesis,

socio-cultural theory, individual differences, learner autonomy, and affective filters. However, this study only focuses on students' interaction in an online context; therefore, only related SLA theories: the input hypothesis, output hypothesis, and interaction hypothesis, will be discussed.

2.6.1 The Input Hypothesis

According to Krashen (1985), SLA is fundamentally influenced by comprehensible input, which states that language is acquired when learners understand the message (input). Learners perceive the input message when they are exposed to the learning materials in an authentic and real context of communication; and when they are engaged in interaction on the basis of their needs and learning styles. In this sense, he asserts that "the Comprehension Hypothesis is closely related to other hypotheses. The Comprehension Hypothesis refers to subconscious acquisition, not conscious learning. The result of providing acquirers with comprehensible input is the emergence of grammatical structure in a predictable order. A strong affective filter (e.g. high anxiety) will prevent input from reaching those parts of the brain that promote language acquisition." (2004, p. 1). When students work together in collaborative settings, they need to make themselves understood, so they naturally adjust their input to make it comprehensible (Krashen, 1985).

2.6.2 Output Hypothesis

In spite of being a key theory in SLA, comprehensible input alone is not sufficient to form effective language acquisition. Swain (1985, 1995), in contrast to Krashen's input hypothesis, argues that output hypothesis also plays an important role in SLA. She contends that output can stimulate learners to move from attention to meaning to attention to form, which is necessary for accurate language production.

She explains that "learners may notice a gap between what they want to say and what they can say, leading them to recognize what they do not know, or they know partially." Furthermore, Swain (p. 132) emphasizes that noticing is a key element to SLA, and hypothesizes that output works as learner's hypothesis testing, as she asserts "learners may output just to see what works and what does not." In this sense, Long (1996) asserts that when interlocutors cannot understand learners' utterances, this provides implicit evidence that there could be something wrong or missing in their use of language. Schmidt (1995), who is in favor of the concept of noticing, argues that whether conscious or unconscious, when learners notice a linguistic form, it becomes intake and it is essential to SLA.

CL, unlike in the traditional teacher-led classroom, provides the possibility of students having opportunities to create output, as many students are talking simultaneously, instead of one person, normally the teacher who dominates all the talk (Long & Porter, 1985). Also, group interaction is structured in an attempt to balance the opportunities that each student has for creating output communicatively; and hopefully, learners are expected to notice grammatical structure when they are engaged in communication.

2.6.3 Interactional Hypothesis

Another theory of SLA is proposed by Hatch (1978) and Long (1981), who do not believe that Krashen's input hypothesis alone is sufficient to explain SLA. Hatch strongly disagrees that students should focus on form before meaning. Instead, according to her tenet, language learners learn how to do conversation and interact verbally in communication first, then they will develop their understanding of language structures later.   In favor of this view, there have been many research studies on SLA

supporting the interactionist approach in language learning. Some significant theories concerning interactionism include Hymes' (1972) notion of sociolinguistic competence, which is in contrast to grammar competence; and Halliday's (1970) analysis of syntactical functions of language. In addition to this view, Long (1996) uses the term interactional hypothesis to argue that conversational interaction is a key to language development. He postulates that conversations are not only a way to practice language, but also a way in which learning occurs.

Advocates of interactionism expand the notion of Krashen's input hypothesis to group interaction through the negotiation of meaning (Oliver, 1998; Pica, 1996). The term "negotiation of meaning" is the process by which speakers try to make their messages clear to each other. Negotiation occurs when one interactant signals to another that there something has not been understood. Learners receive more and different kinds of input through negotiated interaction, and they subsequently have more opportunities for output. Major researchers in the area of negotiated interaction in dyads include Gass and Veronis (1989, 1994), Long (1983, 1996), Pica and Doughty (1983, 1984), and Pica (1994). Long (1996) argues that negotiated interaction that elicits negative feedback is important for the learner in order for him/her to notice the gap between what he/she can currently produce in his/her interlanguage and what is it is necessary to produce in order to facilitate comprehension.

However, it is not only dyadic conversations that can encourage negotiation of meaning, collaborative group work can also promote this type of interaction. Kagan (1995), for instance, argues that a small group setting allows a higher proportion of comprehensible inputs, so the speaker is occasionally requested to adjust his/her speech to the level appropriate to the listener(s) to negotiate meaning. Supporting this view,

Gass (2003) adds that while learners are engaged in communicative interaction or the negotiation phase, they tend to learn the language. In a communicative interaction, more-proficient learners can facilitate less-proficient ones by adjusting the target language by repeating, rephrasing, or asking questions so that their messages can be understood. In other words, more-proficient learners can scaffold less-proficient group members to reach the zone of proximal development (ZPD) through negotiation of meaning. Kagan (ibid.) has a different opinion on this point. He argues that a learner might achieve comprehensible input in the ZPD, but his language acquisition is not ensured unless the input is received repeatedly from a variety of sources, and CL group is just such a natural and helpful source of redundant communication.

In conclusion, second or foreign language is learned on the basis of SLA when learners are exposed to comprehensible input, and language is used for communicative purposes. Then, learners interact with each other by negotiating for meaning. Through communicative interactions, learners can notice language rules or test their hypotheses about language. CL is an effective approach that assists language acquisition because it promotes communication as well as providing opportunities for enhanced language production, which consequently allows learners to negotiate for meaning in natural environments (Ford, 1991; Long & Porter, 1985).

While CL offers learners opportunities the use of the target language for interaction with members in the groups with less control from the instructors, SLA theories contribute to a profound understanding of how language learners acquire and learn their target languages. The combination of CL principles and SLA theories can be used to construct a promising alternative approach to language learning and

teaching. Numerous studies have demonstrated how to effectively apply CL in language classrooms.

In addition, a considerable number of these research works have suggested that the integration of computer-assisted language learning (CALL) is one of the most intriguing options (Arnold & Ducate, 2006). The following section, therefore, will provide an informative review of CALL, how it has been involved in the field of language learning, as well as how it facilitates CL.

2.7 Computer-Assisted Language Learning (CALL)

Computer technology has been involved with language learning and teaching since the 1960s (Seferoğlu, 2005) with the name "Computer Assisted Language Instruction" (CALI) which originated in the United States. The name CALI was widely used to cover any implementation of computers for learning and teaching purposes until the early 1980s. The term "Computer Assisted Language Learning" (CALL) became the dominant term and has, therefore, been used since then. CALL can be broadly identified into three phases: behaviouristic, communicative, and integrative CALL (Warschauer, 2000; Warschauer & Healey, 1998).

2.7.1 Behaviouristic CALL

The first phrase of CALL originated in the 1950s and developed through the 1970s. In these eras, CALL was mainly based on behaviouristic theories of learning as behaviourism was a dominant platform of the pedagogical methods then in use. Programs in this phase, therefore, basically entailed repetitive drill and practice. The "drill and practice" courseware was popular at that time while computers acted as carriers of instructional materials for the learners; therefore, the "computer-as-tutor"

became a popular model (Taylor, 1980). The main points of the rationale behind behaviouristic CALL can be listed as follows:

- repeated exposure to the same material is viewed as effective and valuable to learning

- repetitive drills delivered by computer can be done as many times as desired by the user

- self-paced and self-directed learning could be achieved even out of class time through the use of computers

With these advantages, behaviouristic CALL gained popularity and became an influential tool in language teaching at that time. However, in the late 1970s, behaviouristic CALL was faced with critiques from modern language teachers and behaviourism was challenged by a new pedagogical method, communicative language teaching (CLT); thereafter, its popularity gradually declined. According to Warschauer (1996), the critiques focused on two main points. First, behaviourism was viewed by educators and language teachers as failing to promote effective language learning, while the new pedagogical approach, CLT, was taking the floor of language teaching. Secondly, the advancement of personal computers allowed a wider range of possibilities for language learning. For these reasons CALL shifted to a new phase.

2.7.2 Communicative CALL

In the early 1980s, the new pedagogical paradigm called "communicative language teaching" (CLT), which focused more on the use of language rather than its structure, was gaining more influence in the field of language teaching, and eventually replaced behaviouristic pedagogical methods.

Underwood (1984) was among the first theorists who adopted CLT principles to CALL programs, hence changing the face of computer software packages for language learning to the following features:

- focusing more on the use of language rather than its structures;

- teaching grammar implicitly rather than explicitly;

- encouraging students to produce language originally by themselves rather than just letting them follow computer-produced dialogues;

- giving more meaningful evaluative feedback;

- being more flexible rather than adhering strictly to students' responses;

- providing more various activities and being more interactive with students than the textbooks.

With these features, CALL programs were developed in many aspects. First, lessons were provided for skill practice in non-drill formats such as self-paced reading, text reconstruction, and language games (Healey & Johnson, 1995b). This approach is still in the form of "computer as tutor" model, like that of behaviouristic CALL, since the computer still acts as the "knower of the right answer" (Warschauer, 1996), however, the way the computer arrives at the right answer involve a considerable amount of student's choice, control, and interaction. Another CALL model used for communicative activities is the "computer as stimulus", as in programs that stimulate writing or discussions. Finally, another communicative CALL model is called the "computer as a tool". This model of CALL does not directly involve language learning on its own, but it rather enables the student to

understand and use the language. These programs include word processors, spelling and grammar checkers, and concordancers, for example.

Communicative CALL had been widely used as by language teachers for nearly two decades. Until the late 1980s, many educators felt that CALL had not yet been developed to its utmost potential (Kenning & Kenning, 1990; Pusack & Otto, 1990; Rüschoff, 1993). Moreover, computers were viewed as being used in a "stand alone" manner away from the language learning process. They were often used in an ad hoc manner and in a disconnected manner from from what were regarded as the 'real' lessons in the classroom. Therefore, a number of educators started looking for a more integrative way of using computers for language learning. This challenge, thus, pushed forward CALL to a new phase called integrative CALL.

2.7.3 Integrative CALL: Multimedia and the Internet

This section addresses two important technological developments of the last decade: multimedia computers and the Internet, which will be discussed in detail below.

2.7.3.1 Multimedia and CD-ROM

The advancement of computer technology allows possibilities for computers to display movies, graphics, animation, sound, and video which are called multimedia. These new features widen the range of capability of CALL to provide more authentic, realistic, and motivating materials. The invention of the compact disc read-only-memory (CD-ROM) made it possible and easier to integrate a variety of learning media in an all-in-one package. Moreover, what differs from the two previous CALL phases is that integrative CALL provides learning media in a nonlinear manner, which is called "hypermedia." An outstanding property of hypermedia is that it allows the student to jump to any unit contained in the material at his own will. Hypermedia

resources can be navigated through the use of the point-and-click method to the desired unit. Furthermore, CD-ROM also allows the contents of different forms of media to be installed and accessed onto a single personal computer (PC).

Hypermedia CD-ROMs have gained much interest from language teachers for a number of reasons. First, it allows a more authentic learning environment, especially its more realistic simulation which engages students to more authentic real world situations. Secondly, skills can be easily integrated in a single activity. Third, students have full control of what they want to learn at their own pace and decision, hence forming the habit of learner autonomy. Finally, the main focus is placed on content and, at the same time hints, language help, and learning strategies are provided to the user.

Despite being very advantageous and satisfactory, there are some potential disadvantages of multimedia-based learning, as pointed out by Warschauer (1996). The first problem is that program developers may not base their courseware design on proper pedagogical principles, whereas teachers themselves may lack the technological skills to make the best use of multimedia. Another problem is that computer programs are not intelligent enough to be truly interactive, and their ability to diagnose students' problems with pronunciation or syntax is still limited.

2.7.3.2 The Internet

Apart from hypermedia CD-ROMs, another technological advancement of computers is the introduction of the Internet. The Internet, sometimes called the Net, is a worldwide system of computer networks - a network of networks in which users at any one computer can, if permitted, get information from any other computer through hypertext links. There are various kinds of Internet services e.g. the World Wide Web

(WWW), electronic mail (e-mail), chat room, and webboard. Currently, the Internet is playing a very influential role in education, including language learning and teaching. It provides not only authentic materials, but also interaction between language learners and teachers.

Communication on the Internet provides more opportunity for learners to look for new friends from another country who could be native or non-native speakers of a target language, hence offering the learners opportunity to acquire the target language and to understand the cultural background of their conversation partners. In other words, the rapid growth of the Internet has widened the possibilities in the world of language learning and teaching, especially in terms of channels of communication that are open regardless of national boundaries and the availability of conversation partners (Warschauer, 1997). This mode of Internet-based communication is called computer-mediated communication (CMC), which plays a dominant role in many aspects of language learning (Beatty and Nunan, 2004) and collaborative learning (Naidu, 1997; Stacey, 1997; Oliver and Omari, 1999).

CMC is generally divided into two modes: synchronous and asynchronous communication types. In synchronous CMC (SCMC) environments such as chat rooms, instant messagers, voice conferencing, and video conferencing, communication partners interact with each other through written texts, voice chat, or video conference simultaneously as in real face-to-face communication. This mode of communication can be accomplished when every participant is online. On the other hand, in asynchronous CMC (ACMC) settings, such as e-mail, webboard, and newsgroup, interaction does not need to be simultaneous. Participants can leave their messages, then

communication partner(s) may post his/their replies later. This method of communication, therefore, does not occur in a real-time fashion.

The development of the Internet and the modern features of CMC has now brought us from the first generation Internet (Web 1.0), which incorporated traditional hyperlinked pages and the use of e-mail and chat, to the second generation Internet (Web 2.0), which integrates social network applications, such as wikis and weblogs, or blogs for short (Blake, 2008). Unlike Web 1.0, which is referred to as "read-only" web, web 2.0 allows more freedom to users to take part in sharing and editing content on the participatory web (O'Reilly, 2005). It consequently enables web visitors to be part of the website community. One of the most famous Web 2.0 sites applied in foreign language education is the computer-supported collaborative learning (CSCL) (Beldarrain, 2006), which will be further discussed in detail in the following section.

2.8 Computer-Supported Collaborative Learning (CSCL)

As discussed earlier in Chapter 1, collaborative learning itself neither automatically engages students to work together collaboratively nor does it improve students' construction of cognitive skills and complex knowledge structures. In order to increase the possibilities for mutual understanding and task-related social interaction, interaction tools are needed that are adequately related to both of the new concepts to be learned (Katz & Lesgold, 1993). One of the most promising innovative tools in promoting students' collaborative learning in online settings is computer-supported collaborative learning (CSCL) (Ewing & Miller, 2002; Gillies, 2004; Lehtinen, Hakkarainen, Lipponen,Rahikainen, & Muukkonen, 1999).

Computer-supported collaborative learning (CSCL) is a kind of CALL, in which the computer is employed to favor learning. What distinguishes CSCL from other CALL utilities is that CSCL is particularly used to encourage users to collaborate or to contribute themselves to a shared learning goal. It is an emerging branch of the learning paragidm in concert with studying "how people can work and learn together with the help of computers" (Stahl, Koschmann, & Suthers, 2006). By working together in the new computer-supported environment, it is believed that: (a) the setting of activity, (b) the dynamics of the interactions, (c) the support of members' equal opportunities to participate and contribute, (d) the configuration of the group; and (e) the variety of communication used for interacting will provide wider space for students to achieve a shared understanding and to co-create knowledge (Nachmias et al., 2000, p. 95).

With the continuous advancement of ICT, the generation of web tools has now been divided into two generations. The first-generation web tools, simply referred to as Web 1.0, such as e-mail, chat, and threaded discussion have availed themselves of effective online communication courses (West & West, 2009). However, the second-generation, alternatively called Web 2.0, are web tools, such as wikis and blogs which have a greater potential for building collaborative learning communities (Palloff & Pratt, 2005). Wikis, to be specific, are recognized as powerful tools that can effectively promote collaborative learning. Therefore, there is no doubt that the number of wikis being adopted for education grows daily (Godwin-Jones, 2003). Details of wikis will be provided in the following section.

2.9 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 and Cunningham, 2001, in Martinez-Carrillo & Pentikousis, 2008). 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.

Wikis link online technology with social aspects. What distinguish wikis from other online environments, such as Learning Managing Systems (LMS) and other Internet-based applications is its open and flexible architecture (Lund, 2008). The design of a wiki is not as solid, i.e. containing a fixed structure, as that of an LMS, but it depends on types of activity. Content and networked structures are constructed from within the system as users add information and it employs a very simplified hypertext mark-up language (HTML) to create links and add features. While activities in LMSs and other Internet-based platforms are linked to individual work, such as personal

portfolios, which can be shared later, activities in wikis are collective, which allows content formation and indefinite growth of the website.

In comparison to other Web 2.0 applications, West & West (2009) contend that, on the one hand, wikis are similar to other types of communication tools, e.g. web logs (blogs) or discussion forums, in that they all provide an asynchronous mode of online communication. On the other hand, blogs are generally posted and handled by a single author, and others may or may not be allowed to edit the content or leave comments. Discussion forums, similar to wikis, also support the postings of comments or messages from other visitors. Moreover, visitors are allowed to share ideas, provide comments, and generate conversation around a specific topic. However, in comparison to wikis, discussion forums are static; users can only elaborate, but not edit, on existing messages. In contrast, wikis are dynamic, i.e., allowing other users to change or even delete someone else's posting. A comparison between wikis and the other two asynchronous web tools is presented in the table below.

Table 2.1 Comparison of Asynchronous Communication Tools

Wikis	Blogs	Discussion Forums
collaborative authorship	single authors	multiple authors
dynamic	static	static
nonlinear and multipage creation	linear	threaded construction

One of the most well-known wiki-based websites is Wikipedia (www.wikipedia.org). It is a free online encyclopedia where people are invited to read and, in most articles, are allowed to modify contents. Wikipedia was first introduced

in 2001; since then it has gained so rapidly in popularity that it has eventually become one of the most favorite reference websites amidst continuous debates on the accuracy of its contents (Shareski and Winkler, 2005). 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 on line (Wang and Turner, 2004).

In terms of language instruction, wikis have been used in a variety of ways to promote language skills. The following section will present a brief review of previous research studies concerning the implementation of wikis in the area of language instruction.

2.10 Related Research on the implementation of Wikis in EFL Online Collaborative Learning

As discussed in the previous section, wikis have been widely employed in the cyber world since 1995. However, they have only been introduced to the area of language education in less than a decade. Therefore, there have been only a handful of research studies on the implementation of this web 2.0 application in the field of language instruction, parlicularly in English . Within a concise body of research studies, wikis have been utilized to improve students' language skills across different

levels of education and disciplines. A brief review of research studies works involving the application of wikis in language instruction follows.

Chang (2009) investigated the effects of having students provide word meanings in L1 collaboratively using digital pens on wikis and their satisfaction in doing wiki-based reading versus paper-based reading. The experiment was conducted with 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 on 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 the glossing of problematic words, which in turn eased their reading. However, the majority of the participants complained that the activities were confusing and unclear to them.

Chen (2008) conducted an experiment to examine the effects of wikis on students' language skills, students' communication channels, attitudes, and experience in using wikis to improve their language skills. The participants were ninety-seven Taiwanese college students taking a General English course. They were divided into two groups, one as the experimental group of 50 students and the other as the control group of 47 students. The treatment of the study lasted six weeks. Students of both groups used the same English textbook and were under the same teaching process. What differed was that classroom assignments and exercises of the experimental group were designed wikispaces whereas those of the control group were undertaken using traditional classroom methods. Both groups of students were arranged into groups of five to six members of different language proficiency judged by students' grades on their English courses. Each group contained two students with a high level of language

proficiency, another two of moderate proficiency, and another one or two members with lower language proficiencies. Each student in the group was assigned one of the following roles: the checker, the recorder, the elaborator, the encourager, and the praiser. This grouping method applied to both classes.

The participants of the experimental group were required to listen to the assigned dialogue in the textbook, then transcribe it in word documents and post it on their wikis. Then, they were assigned to critique one of their group member's works, and revise others' posting work. After that, the students were asked to give a presentation to the class. The students' work and performance were marked by the researcher. Every member within the group received the same score. The control group received the same procedure, but the activities were performed using a traditional paper-and-pencil method. After the activities were carried out, a questionnaire on students' attitudes toward the use of wikis, and an interview were carried out with the experimental group.

The study demonstrated that the experimental group performed the tasks statistically better than the control group in both listening and reading activities. They also expressed positive attitudes towards using wikis in helping them to complete their assignments. The students also appreciated using wikis as they were allowed to collaborate, negotiate, and contribute to each other's work. However, some students reported encountering problems and confusion with the interface and the edit functions in using the wikis.

Another study on the use of a wiki was carried out by Wang, Lu, Yang, Hu, Chiou, Chiang, & Hsu (2005) in an effort to investigate the relationship between students' web-editing behavior and their performance in the final examination of a

language course. The study was conducted with 43 first-year public college students in Taipei enrolled in an ESL course. In this two-week research project, each student in the class was assigned to write an essay entitled "If I were Bill Gates…" and post it on an pre-arranged wiki website for the class. Other students, including the teacher, were welcomed to post comments on any or all parts of the essay. The study did not only focus on how many times the students posted the comments, but also on how often the students edited their own work. This was tracked by the use of a web mining tool called WUM. The students were classified into two groups: High and Low Usage Groups. Then, the frequency of individual editing usage was compared with his/her performance in the final examination of the course. The study revealed that students in the Low Usage Group performed better in the final examination of the English course than those in the High Usage Group. This finding has resulted in more follow-up studies to explain this phenomenon.   More factors such as learning styles and more a rigorous research design are suggested.

Martinez-Carrillo, and Pentikousis (2008) conducted a study on the effect of a wiki on students' Spanish proficiency and collaborative skills. The participants were nine university students of Spanish in a second language class. All the participants were required to create a wiki on any topic related to Spanish culture as a course project. They were asked to work in groups of three students. The project was divided into five stages: (1) making a list of online references, (2) discussing the web pages within the group , (3) selecting a set of websites as the foundation of their wiki, (4) constructing a wiki and adding related links, pictures, or embedded clips, and (5) presenting their wiki to the class for evaluation. At the end of the course project, the students were asked to do a survey questionnaire about the improvement of their Spanish, the use of wiki in

collaborative writing, collaborative work in small groups, and reading and resourcing skills. The study revealed that the students could use wiki appropriately to communicate (such as making comments and editing) while learning the target language. Also, they reported being happy with working in groups, despite some students expressing a preference for working alone. Regarding language skills improvement, most students were certain that their Spanish vocabulary expanded through reading online texts in Spanish. In terms of writing skills, all groups encountered the same problem in starting to write. One of the main complaints, nevertheless, was the confusion with some features of the wiki e.g. adding pictures, fixing font size, and simultaneous page editing. More guidance at an early stage of use was recommended.

Next, McDonald (2007) undertook an experiment to promote the application of wikipedia in language classrooms. The participants were eight third-year university students attending a 7-day intensive English camp. The first two days of the camp were allocated for student orientation to the course and, exceptionally, to Wikipedia. In the orientation session, the students were required to explore other wikipedia both in their L1 or English and get familiar with this online encyclopedia. In the rest of the course, all the students were asked to create a wiki in English about interesting areas in the host university of this English camp, Sengari University. All the eight students were divided into four pairs. Each pair was assigned to find information from different sources e.g. the library, staff interviews, and online searches. Then, each pair was asked to post their information on the wiki. 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. Once the presentations were finished, the participants were given an interview. The interview revealed that the

students were motivated in learning via a wiki. They also expressed their preference for group work because they could see opinions form other members in the group. However, some weaknesses of the project were reported. First, the time of the course was too short, hence, there was insufficient time for the students to complete their wikis as they had expected. Another problem was the popping up of warnings on the wiki in each step of posting which confused the students.

Kessler (2009) conducted a study to observe learner-regulated collaborative attention to form in a writing course through the use of a wiki. The participants included 40 EFL students, aged between 21 -23 years, in a BA program in ELT in Mexico. The participants were at a similar level of English proficiency. The participants were required to attend a 16-week course entitled the Culture of the English-Speaking World. They were requested to undertake various group work tasks throughout the course which included presentations, feedback, student-teacher interactions, and giving feedback in terms of grammatical accuracy. A wiki was set up for this group of students to post the collaborative essays assigned by the teacher. Once the wiki had been set up, the teacher gave full authority to the students to manage it without any further intervention. The wiki tasks were assigned four times during the course. Students' essays were viewed and evaluated for both meaning and form. All edits were automatically recorded in the system log. The data of the experiment were taken from Wiki, students' logs of edits and corrections, students' feedback, and interviews. Most of the students revealed a tendency to focus on meaning rather than form in their feedback and revisions. According to the students' logs, a considerable number of students found additional links to other web resources, and font adjustments to improve visitors' understanding of their contents were observed. The interviews also showed

that the students appreciated using collaborative technologies in helping them with grammatical accuracy.

Woo, M., Chu, S., Ho, A., and Li, X. (2011) investigated the advantages and challenges of using wikis to assist students' collaborative writing within a Hong Kong upper-primary English language class in order to address gaps found within the research on the positive use of wikis. The findings demonstrated a potential use of wikis to assist young EFL writers' with creative reasoning and meaningful learning and positive perceptions from students and teachers in the study. Using wiki had enhanced students' collaborative writing and helped to scaffold their language skills. The researchers have also confirmed that wiki is simple enough for younger EFL writers to manage and allows teachers to provide timely feedback.

In Thai EFL contexts, in spite of a small number of studies on the application of wikis, some advantages of the applications of this Web 2.0 have also been demonstrated. For example, Wichadee (2010) investigated the effects of a wiki on students' summary writing. In her experiment, a class of thirty-five students was selected as the participants. During the course, the students were assigned to write summaries of five articles in their text books in groups of four to five members. Each group of students started each task with one member posting his/her summary on a wiki, then, the other members in the group reviewed it. Once any information was corrected, students needed to justify their changes. At the end of each task, the teacher gave 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 (2009) 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 project writing 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 completed and successfully published on the wiki, students were required to take a two-hour timed writing test, individually. The students' tests were then evaluated by two raters using analytical scoring. The results revealed that there was a high correlation between the students' use of wikis for editing their work and their writing test scores. In other words, those with a high usage of wiki outperformed those with a low usage in the test. Moreover, collaborative writing through the wiki had positive effects on students' perceptions and performances.

These research studies on the use of wikis have shown the practical potential and effectiveness of this Web 2.0 application across various aspects of language education. However, most of them demonstrated only the learning outcomes, but did not report on the process of collaborative learning, i.e. the way students interact and communicate on wikis in order to construct their outputs. Also, there is only a small number of research works addressing instructional models and foundational elements in designing an instruction framework for wikis in order to optimize the use of this Web 2.0 application. The next section will present a discussion of the importance of instructional system design (ISD) and some examples of influential instructional models.

2.11 Instructional System Design (ISD)

Instructional System Design (ISD) is a framework for the plan for lessons, materials, and the evaluation of a course. It is an essential element for both classroom and online instruction as instructional design has a direct impact on instructional effectiveness (Clark, 1996; Jonassen, 1998). ISD is considered to be both a science and an art. It is a science because it has roots in learning theories, and it is an art because the designing of instructional materials is a highly creative process (Moore, Bates & Grundling, 2002).

ISD synthesizes instructional practice, research, and theory into a methodology for learning development that is systematic (inputs produce outputs which, in turn, become inputs) and systemic since the components have a symbiotic relationship (Edmonds, Branch, & Mukherjee, 1994, p.56).

The goal of instructional design is to create successful learning experiences and to engender the transfer of training. ISD provides a road map to guide designers and instructors through analysis, design, development, implementation, and evaluation to their goal. The ISD road map (the science) provides a route to many different destinations depending on the turns (the art) one chooses to take. At its most basic level, instructional design focuses on three fundamental concerns: identifying the goals; selecting the strategy; and, evaluating success. (Moore, Bates & Grundling, 2002). In addition, Moallem (2001) asserts that the utilization of instructional design principles in online instruction helps to ensure that the instructional modules are of a high quality and provide significant challenges to students.

To discuss further details about ISD, the following sections will provide brief descriptions of the definitions of ISD and a number of influential ISD models.

2.11.1 Definitions of ISD

In the past four decades, the terms instructional system design (ISD) has been defined in various ways with inconsistent use of terminology. The two most common terms are instructional system design (ISD) and instructional development (ID) (Gustafson & Branch, 2002). However, both terms are used on the basis of the same concepts. The term "ISD," nevertheless, will be used in the proposed study.

ISD has been given numerous definitions by different instructional system designers and scholars. The Association for Educational Communications and Technology (AECT) in 1977 referred to the term ISD as "a systematic approach to design, production, evaluation, and utilization of complete systems of instruction, including all appropriate components and a management pattern for using them." (p. 172). Similarly, Seels and Richey (1994, p. 31) define the term instructional system design (ISD) as "an organized procedure that includes the steps of analyzing, designing, developing, and evaluating instruction." Likewise, Smith and Ragan (1999) postulate that ISD means a systematic and reflective process of interpreting principles of learning and instruction into plans for instructional materials and activities, information resources, and evaluation. Similarly, Dick, Carey, and Carey (2001) assert that ISD is the systematic approach for the design, development, implementation, and evaluation of instruction.

Although there are various definitions that vary from one instructional system design model to the next, it can be seen that instructional system design is comprised of at least five main activities: 1) analysis of the setting and learner needs, 2) design of a set of effective, efficient, and relevant learner environment, 3) development of all instructional materials, 4) utilization of the resulting instruction, and 5) formative and

summative evaluations of the results of the development. These five elements of an instructional system design have been referred to as "ADDIE," which has been accepted as a generic ISD model (Gustafson & Branch, 2002). A sixth element or activity may be added in order to improve the model to suit a specific learning context, hence producing different ISD models.

2.11.2 Instructional System Design Models

In order to design a model of an instructional system, Gustafson and Branch (2002) argue that the designer has to consider the following five explicit assumptions.

1. ISD models serve as conceptual, management, and communication tools for analyzing, designing, creating, and evaluating guided learning, ranging from broad educational environments to narrow training applications.

2. There is no single ISD model that is perfectly matched to the varied learning environments. Therefore, IS designers should be capable of applying and adapting a variety of models to meet the requirements of specific situations.

3. The greater the compatibility between an ISD model and its contextual, theoretical, and philosophical origins, the greater the potential is for success in constructing effective learning environments.

4. ISD models help one to consider the multiple backgrounds of learners, the multiple interactions that may occur during learning, and the variety of contexts in which learning occurs.

5. Interest in ISD models will continue and, as a consequence, the level of application will vary depending on the context or situation.

From these assumptions, it can be concluded that the duties of instructional designers are to plan and design instruction usually to solve a specific problem for a particular audience of learners, whether in an educational institution or in a corporate setting. The specific problem initiates a complete analysis of the learning context, including the environment, instructional needs, learner characteristics, and goals. The next section will provide further discussion about the basic elements of an instructional model, how models are classified, and examples of instructional models classified by types.

2.11.3 Basic Elements of an Instructional Model

This section provides a detailed discussion of basic elements of an instructional model. According to Gustafson and Branch (2002), an instructional model should be comprised of five basic activities: (1) analysis of the setting and learner needs, (2) design of a set of specifications for an effective, efficient, and relevant learner environment, (3) development of all learner and management materials, (4) implementation of the resulting instruction, and (5) both formative and summative evaluations of the results of the development. These basic activities are referred to as ADDIE for short.

The ADDIE instructional design model is the generic process originally used by instructional designers and training developers (Seels & Glasgow, 1998). This model is the most commonly used system for instructional system and material design since it is rigidly systematic and easy to implement (Sommerville, 1989). This instructional scheme represents a dynamic, flexible guideline for building effective training and performance support tools.

Analysis

In the analysis phase, the instructional problem is clarified, the instructional goals and objectives are established and the learning environment and learner's existing knowledge and skills are identified.
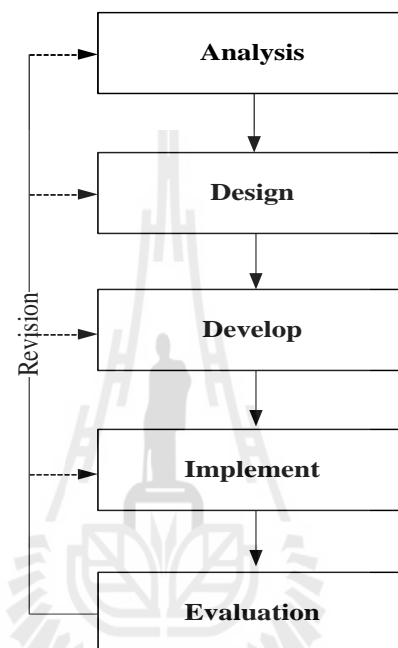
Figure 2.3 ADDIE Model

Design

The design phase deals with learning objectives, assessment instruments, exercises, content, subject matter analysis, lesson planning and media selection. The design phase should be systematic and specific.

Development

The development phase is where instructional designers and developers create and assemble the content assets that were blueprinted in the design phase. In this

phase, storyboards are created, content is written and graphics are designed. If e-learning is involved, programmers work to develop and/or integrate technologies.

Implementation

During the implementation phase, a procedure for training the facilitators and the learners is developed. The facilitators' training should cover the course curriculum, learning outcomes, method of delivery, and testing procedures.

Evaluation

The evaluation phase consists of two parts: formative and summative. Formative evaluation is present in each stage of the ADDIE process. Summative evaluation consists of tests designed for domain specific criterion-related referenced items and provides opportunities for feedback from the users.

According to Figure 2.3, it can be seen that ADDIE's approach is systematic and rigidly sequential. The model shows a complete system approach, i.e. it views human activities as linear systems in which inputs, outputs, processes, and feedback are considered essential and sequential (Molenda, 2003). In other words, the output in each step will be the input for the following step. The Analysis stage begins by surveying the learners and the learning environment to determine which learning problems are of high priority and should be chosen as objectives; in the Design stage those learning objectives are transformed into lesson plans or blueprints; in the Development stage, specific materials and procedures are created to realize the blueprints; in the Implementation stage, learners actually use the materials and procedures that were created; and in the Evaluation stage the learners are assessed to determine to what extent they mastered the objectives specified at the beginning, and revisions are made as needed.

Although the ADDIE model is very systematic and well organized, as stated earlier, this model has been criticized for its strict linearity, inflexibility, and much time-consumption (Kruse, 2009, p. 1). The character of being too systematic, on the other hand, also makes the model too rigid to implement. Furthermore, with the lack of repetitive interaction between each element (as shown by the one-way arrow), system designers have very limited choices to modify or contextualize the model.

Despite some weaknesses, however, the ADDIE model is considered one of the most influential models, which has been taken as an inspiration for the design of other ISD models such as Dick and Carey's Model; Morrison, Ross and Kemp's Model; and Seels and Glasglow's Model. One commonly accepted modification and adaptation of this model is the use of a rapid prototyping technique. Tripp and Bichelmeyer (1990) define rapid prototyping as "the building of a model of the system to design and develop the system itself" (p. 36). Regarding ADDIE model, this is the idea of receiving continual or formative feedback while instructional materials are being created.

In addition to understanding the basic components of an instructional model, it is necessary to be able to identify the types of instructional models in order to be a competent instructional model designer. The next section presents insightful details of model classification and examples of instructional models classified by types.

2.11.4 Classification and Types of Instructional Models

This section presents the discussion of classification schemes and types of instructional models, and some examples of models with reference to their types.

2.11.4.1 Classification of Instructional Models

Due to the fact that instructional design is conducted in a variety of learning contexts, the result is that there exists a vast variety of models. Consequently, it is highly recommended that instructional models be clearly classified on the basis of the assumptions and conditions from which they have been designed. Classification of instructional models can be a guideline for instructional system designers to create learning tasks and activities more systematically to suit students' learning environments (Fauser, Henry, & Norman, 2006)

Gustafson and Branch (2002) assert that instructional design models are classified into three categories: classroom, product, and system. Gustafson and Branch suggest that in order to classify types of instructional models, the following nine characteristics should be taken into consideration: (1) typical output with regard to the amount of instruction prepared; (2) resources to be used in development efforts; (3) team or individual effort; (4) skill in instructional design and experience of the individual or team; (5) whether the teaching materials will be selected from existing sources or an original design or production; (6) amount of front-end analysis; (7) the anticipated complexity of the technology for development and adaptation to environments; (8) amount of tryout and revision conducted; and (9) amount of dissemination and follow-up taking place after development. A classification scheme relating to the three types of instructional models in relation to the nine characteristics is illustrated in Table 2.2.

Table 2.2 A Classification Scheme of Instructional Development Models Based on

        Nine Characteristics

Characteristics	Classroom-oriented	Product-oriented	System-oriented
Typical Output	One or a few hours of instruction	Self-instructional or Instructor-delivered package	Course or entire curriculum
Resources committed to development	Very low	High	High
Team or individual effort	Low	High	Team
ID skill/ experience	Low	High	High/Very High
Emphasis on development or selection	Selection	Development	Development
Amount of front-end analysis/needs assessment	Low	Low to medium	Very high
Technological complexity of delivery media	Low	Medium to high	Medium to high
Amount of tryout and revision	Low to medium	Very high	Medium to high
Amount of distri-bution/ dissemination	None	High	Medium to high

2.11.4.2 Types of Instructional Models

As discussed earlier in the last section, there are three types of instructional models: classroom, product, and system. Each type of model will be further discussed.

2.11.4.2-A Classroom-oriented Instructional Model

The first category of instructional models is classroom-oriented. This type of instructional models is usually designed for instructors, teachers from Grade 12 up to the level of colleges, vocational schools, and institutes at a level of high

education. These models take the environment of the teacher into account. Practitioners of these models consider them as a guide rather than a methodology. The primary focus of this class of models is on implementation of existing materials rather than the creation of new ones. These models produce a small output. Moreover, they are usually developed for short-term use, within one school year, for example. Furthermore, the models have less rigorous formative evaluation than product or system-oriented models. Some examples of classroom-oriented models are Morrison, Ross and Kemp Model and the ASSURE Model.

The Morrison, Ross and Kemp Model (MRK)

The Morrison, Ross and Kemp (MRK) model is classroom-based and describes a holistic approach to instructional design that considers all factors in the learning environment. This model prescribes a process that is cyclical and subject to constant revision. This highly flexible model is designed to focus on content and appeal to teachers (Prestera, 2002). The MRK Model is shown is Figure 2.4.
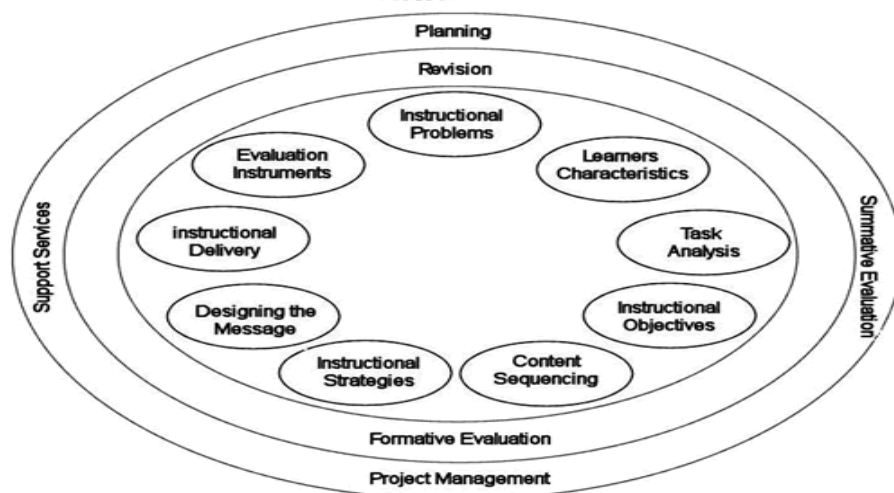
Figure 2.4 The Morrison, Ross and Kemp Model

Although rooted from ADDIE, the MRK Model is distinguished from the generic model and some other models in three aspects. First, instruction is considered from the perspective of the learner whereas some other models are more teacher-centered. Second, the model takes a general system view towards development (model components are independent of each other) with instructional design being presented as a continuous cycle. In this aspect, other models are more likely to be in a linear process. Finally, the model emphasizes the management of the instructional design process.

Applying this model, first, the instructional designer begins by asking questions related to the: required level of learner readiness; instructional strategies and media that are considered to be the most appropriate for the content and the target population; level of learner support required; measurement of achievement; and strategies for formative and summative evaluation (Morrison, Ross, & Kemp, 2001, p. 4).

Then, the designer focuses on the nine elements of the model. These elements are independent of each other in that they do not need to be considered in order, nor must one start with a particular element. The nine elements are: identify instructional problems and specify goals for designing an instructional program; learner characteristics that will influence your instructional decisions; identify subject content and analyze task components related to stated goals and purposes; specify the instructional objectives; sequence content within each instructional unit for logical learning; design instructional strategies so that each learner can master the objectives; plan the instructional message and develop the instruction; develop evaluation instruments to assess objectives; and, select resources to support instruction and

learning activities (Morrison et al., p. 6). The model recognizes that not all nine elements are required for all projects (Remley, 2002). The loose connectivity between the elements, in turn, enables the start to take place anywhere within the model. As a result, a designer is able examine the entire scope of a project more effectively and thoroughly.

To employ the MRK model, those with little instructional design skill could perform minimal front-end analysis and develop an instructional scheme using few or no additional resources. Also, the model allows the designers to choose from existing instructional materials suited to a technically simple and non-distributed delivery media. Moreover, formative evaluation on the final materials is flexible and optional (Gustafson and Branch 2002). For more experienced designers, or ones with access to more resources, this model can be simply applied in the design of a complex and widely distributed program. In addition, with its flexible connectivity of elements, this model fits well with classroom planning (Gustafson and Branch, 2002).

Unlike the ADDIE model, MRK model is more flexible and has additional independent elements without the constraint of linearity. Moreover, while the ADDIE model is a generic model, MRK system is more situation-specific, i.e. it is restricted to classroom context. Therefore, MRK model is considered a classroom-oriented model.

The ASSURE Model

The ASSURE model is one of the recent instructional design models that is fairly easy to understand and easy to apply. It is also considered an effective model that fits into the field of instructional technology (Heinich, Molenda, Russell, & Smaldino, 2002; Shelly, Cashman, Gunter, & Gunter, 2006). This model is

similar to the ADDIE model, but it has more focus on producing the media of instruction for the teaching and learning process, and places the importance of active student engagement in their learning process. These characteristics of the ASSURE model distinguish this system from other models.

This model consists of six main elements, namely, Analyze learners, State Objectives, Select Methods, Media and Materials, Utilize media and materials, Require Learner Participation, and Evaluate and Revise.

Analyze learners

The first step in using the ASSURE model is to identify and analyze the characteristics and traits of your learners that might affect your instruction. As it is not possible to investigate every trait of the learners, however, the ASSURE model suggests the following characteristics be analyzed in depth:

- General characteristics – age, grade level, job or position, cultural or socioeconomic factors;

- Specific entry competencies – knowledge and skills that learners possess or lack;

- Learning styles – spectrum of psychological traits that affect how we perceive and respond to different stimuli, such as anxiety, aptitude, visual or auditory preference, motivation, and so on.

State objectives

The second step of this model is to state the instructional objectives. It is strongly recommended that a designer specifies what students are

required to do and are able to do after successfully completing the instruction. The ASSURE model also suggests that instructional objectives to be as specific as possible, with clearly stated conditions and degrees. The following four components (called the ABCD of the model) should be included in the instructional objectives:

A – Audience, the students;

B – Behavior, a verb describing the new capability that the students will have after instruction, such as define, classify, measure, pronounce, etc;

C – Condition, it implies the condition under which the behavior or capability is to be observed, what tools or equipment students will be allowed or not allowed to use in demonstrating mastery of the teacher's instructional objectives.

D – Degree, this part of an objective specifies the criteria or acceptable performances from the students. This can be achieved by asking questions like "What degree of accuracy and proficiency must learners display? What is acceptable as a minimum requirement?" Degree in this sense could be stated both in qualitative or quantitative terms, and they should be based on some real world requirement.

Select Methods, Media and Materials

Once learners and learning objectives are specified, instructional methods (strategies), media, and materials to deliver the instruction will be selected. As for the method, or instructional strategy, instruction may be delivered

according to the characteristics of the subject matter and students' learning styles. Many research studies suggest that students directed learning activities lead to the most efficient learning experiences for the students. If students actively engage in and participate in class, they tend to retain their new knowledge and skills better and longer.

As for selecting instructional materials, it is advisable to use existing materials that comply with the instructional content. These materials can be modified or created to suit the learning context.

The following are guiding questions that can be used as criteria in selecting instructional materials:

- Does it match the curriculum?

- Is it accurate and current?

- Does it contain clear and concise language?

- Will it motivate and maintain interest?

- Does it provide for learner participation?

- Is it of good technical quality?

- Is there evidence of its effectiveness?

- Is it free from bias and advertising?

- Is a user guide or other documentation included?

Once the instructional method is decided, the designer has to select the appropriate media to deliver it.

Utilize media and materials

The next step in the ASSURE model is to utilize media and materials by the students and the teacher. The increased availability of media and the

philosophical shift in teacher-centered to student-centered learning increases the likelihood that students will be using the materials themselves rather than watching as the teacher presents them. Once the designer has decided on the instructional materials, he/she has to review and prepare them. Then, he/she will prepare the learning environment, the students, and provide the learning experience.

Require Learner Participation

Educators have long realized that active participation in the learning process enhances learning. It is necessary for the designer to require the students to participate in their learning process by making them actively interact with their instructional materials. In this step, the media need to involve the learners so that they become active learners and will not be bored with the lesson. With regard to this point, Gagné (1965) pointed out nine events of effective instruction.

1. Gain your students' attention

2. Inform them of your objectives

3. Stimulate and recall their prior knowledge

4. Present instructional materials

5. Provide guidance

6. Elicit performance/practice

7. Provide feedback

8. Assess performance

9. Enhance retention and apply to the task

Evaluate and Revise

The final component of the ASSURE model is to make a plan to evaluate and revise the teacher's instruction. In this step, we investigate whether we

have reached the instructional objectives. This is one of the most important components in the process, but it is often neglected. The ASSURE model emphasizes that the evaluation is an ongoing process and several different aspects should be evaluated, including evaluation of learner achievement, evaluation of methods and media, and an evaluation of the instructor. Without revision, evaluation is pointless. Therefore, the instruction should be revised based on the information/feedback gathered from the evaluation.

2.11.4.2 B Product-oriented Instructional Models

The second type of instructional model is the product-oriented model. Product models, as the name suggests, are primarily focused on making instructional products. These products can be in the forms of self-study, self-paced computer-based training, or learning media which a student can participate in with reduced guidance. Therefore, in creating instructional products for this type of model, rigorous tryouts and revisions are essential. Product-oriented models are characterized by four assumptions, (1) the instructional products are needed; (2) the primary focus is placed on producing new materials rather than modifying existing ones; (3) extensive tryouts and revision are needed; and (4) the products must be implementable by users with the availability of a facilitator, but not a teacher. An example of this model is represented by the Seels and Glasgow Model.

The Seels and Glasgow Model (1985)

The Seels and Glasgow (1998) proposed an interesting constructivism-based model for instructional design, named after them—Seels and Glasgow Model (S&G Model), with three phases that are self-contained and semi-

linear. This model is situated on the assumption that design occurs in the context of project management (p. 177).

The model is composed of three main phases: needs analysis management, instructional design management, and implementation and evaluation management. Like any other model, each instructional design phase contains interdependent elements that enable numerous cyclical repetitions. Seels and Glasgow presented their model in two separate but similar versions: one for the professional instructional designer (called S&G Model I), and one for the novice (called S&G Model II). Both models contain the same core elements, but differ in terms of complexity of the design. In this study, Seels & Glasglow Model II (illustrated in Figure 2.3) will be discussed.

According to Figure 2.3, the first phase deals with needs and problem analysis. It involves the designer finding the solution using needs analysis. All questions related to needs assessment, performance analysis, and context analysis are addressed.
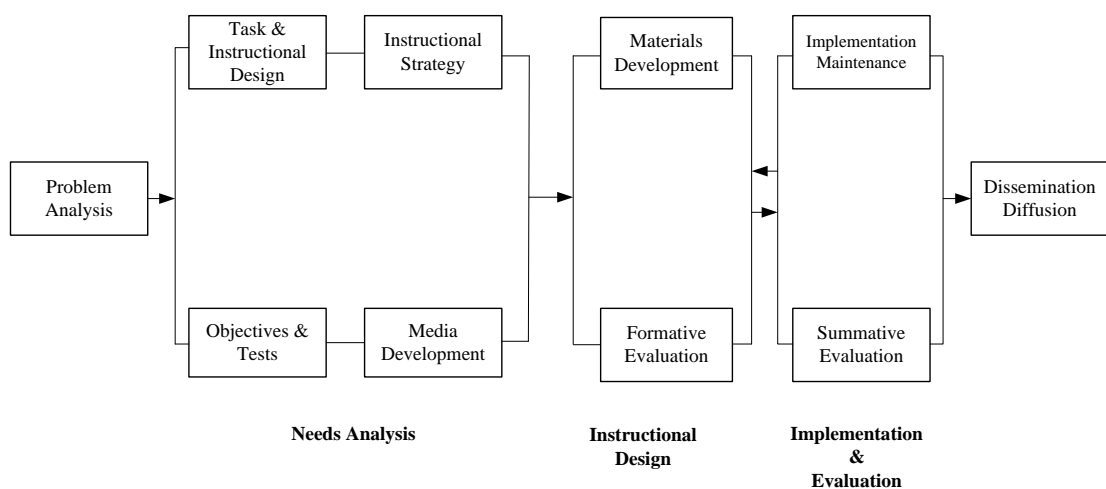
Figure 2.5 The Seels and Glasgow Model II (1998)

The second phase includes all steps involved in the design, development, and formative evaluation of the course. These steps are carried out in order but can be performed repetitively to make adjustments, or the designer can proceed to another step without the preceding step being completed.

The final phase is called the implementation and maintenance phase. It involves real life settings. Preparation of training material and programs are carried out during this phase. Training is conducted and evaluated as well as support systems and materials are provided. Instruction is evaluated and the project is disseminated while the ideas are diffused. Instructors and learners need to learn new technology.

When linked together, the three-stage implementation can be performed in the following steps:

1. Find the problem through needs analysis. Determine whether there is an instructional problem. Collect information through needs assessment and content analysis techniques and write the problem statement.

2. Plan for diffusion and project management.

3. Through task analysis collect more information on performance standards and skills and on attitudinal requirements. Then do an instructional analysis to determine the prerequisites.

4. Write behavioral objectives and criterion-referenced tests to match those objectives.

5. Determine the instructional strategy or components of instruction, such as presentations or practice conditions. Select delivery systems that will allow you to meet these conditions.

6. Help plan for production. Monitor materials development to assure project integrity.

7. Plan a formative evaluation strategy. Prepare to collect data. Revise as feasible and re-evaluate.

8. Plan for implementation and maintenance of the instruction.

9. Conduct summative evaluation. Revise goals if necessary. Adjust design accordingly.

10. Disseminate the innovation.

Although the steps and sub-steps are graphically illustrated in such a way as to suggest a linear implementation, the steps may be conducted concurrently with iterative cycling (Gustafson & Branch, 2002).

From the description above, it can be seen that the SG Model II is created in a linear fashion, but similar to other models, and it has several parts that are interdependent and concurrent. Some elements, such as feedback and interaction, are attached to six steps that impact and interact with them, as indicated by the use of double-ended arrows. As stated earlier, this model was originally designed for product developers who are produced it for adoption and distribution to others. Therefore, the model places its main emphasis on management. Once the final product is completed, summative evaluations are conducted which serve to help train support personnel as

well as improving the production process and the final product, which is indicated by arrows that connect with the beginning analysis stage.

2.11.4.2 C System-oriented Instructional Models

The third type of instructional models is used to produce large amount of instruction, which can be courses or curricula, for example. System models are also used for the development of new materials or improving existing materials. System models are consistent with the ADDIE methodology, focusing on frontend analysis, design phases, and dissemination. These models usually start with a data collection phase to determine the possibility and desirability of developing an instructional solution to a problem. Some examples of this type of models are the Dick and Carey Model, and the the SREO Plan.

The Dick and Carey Model

The Dick and Carey model is one of the most influential ISD system-oriented models. Similar to other ISD models, the Dick and Carey system contains the conventional core elements of the ADDIE model: analysis, design, development, implementation, and evaluation. In the Dick and Carrey Model, the five core elements of ADDIE are broken down into additional and more complex steps with different terminology (Brandt, 2001; Gustafson & Branch, 2002a). This model process is employed in many disciplines such as business, military, as well as technology- and computer-aided instructions (Gustafson & Branch).
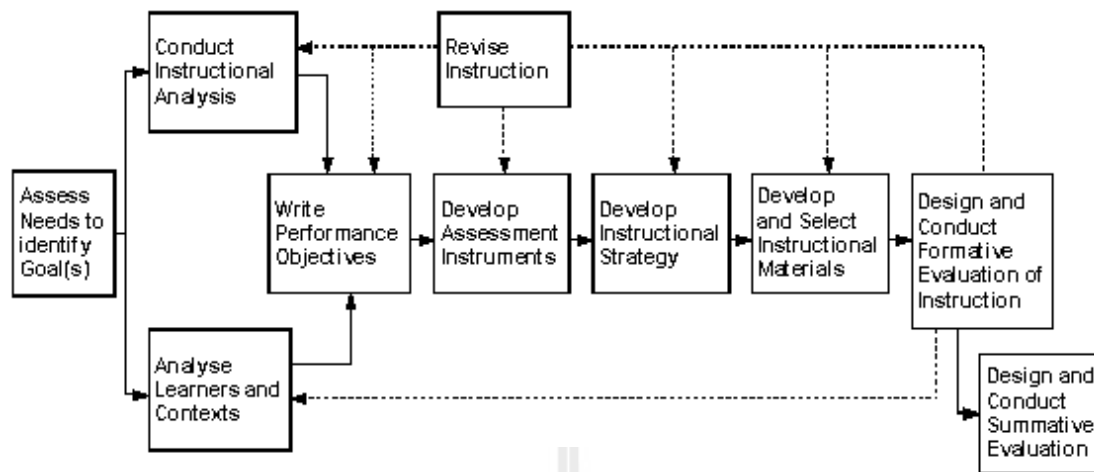
Figure 2.6 The Dick and Carey Model

As illustrated in Figure 2.6, the components for the model stated
by Dick, Carey and Carey (2001) consist of nine sequential steps. Each of these
components is dependent on each other, as indicated by the direction of the solid arrow
lines. The dotted lines representing formative evaluations point to instructional
revisions that originate from re-examination of the instructional analysis' validity and
entry behaviors of learners. The sequential steps for the design are as follows: (a) assess
needs to help identify learning goals, (b) conduct instructional analysis and analyze
learners and contexts, (c) write performance objectives, (d) develop assessment
instruments (e) develop instructional strategies (f) develop and select instructional
material (g) design and conduct formative evaluations, (h) revise instruction based on
formative evaluations, and (i) design and conduct summative evaluation (Dick, Carey &
Carey, 2001; Gustafson & Branch, 2002a).

The application of the first component, namely, "Assess Needs
to Help Identify Learning Goals", makes it unique from other models in that it supports
the use of needs assessment procedures and clear measurable goals, as Dick et al.

(2001,) explain it "Goals are clear statements of behaviors that learners are to demonstrate as a result of instruction" (p. 30). Instructional goals must be created before implementing the ID process (Dick et al; Gustafson & Branch, 2002).

In the second element, "Conduct instructional analysis", before proceeding with instruction implementation, designers must conduct the process of instructional analysis to identify the learner's prior skills, knowledge and attitudes. They must also carefully examine and create step-by step descriptions of tasks to help learners achieve instructional goals (Dick et al.).

Next, the process of "Analyze learners and contexts" aligned with the process of instructional analysis involves the collection of information on learners' entry behavior, characteristics, prior knowledge, skills and attitude, academic motivation and learning preferences. An instructional design can, then, proceed to the selection of an environment that can support learning. The performance context for learning application and skills is important for the building of instructional strategies (Dick et al.).

The following element, "Write performance objectives", aims to specify objectives in the form of specific statements that clearly states what learners will do during instruction and upon completion of the instructional module. These objectives also function as measuring tools that are connected to the assessment step (Gustafson & Branch, 2002). Dick et al. consider this as the foundational step to the next stage for testing.

Once learning objectives are clearly defined, the next step of the model will go to the design of assessment in "Develop assessment instruments". The purpose of assessments is to measure the performance objectives. Being able to identify

each objective's behavior, conditions and criteria, offers the designer guidance on how to select and determine an assessment instrument that can measure performance objectives. Both objectives and assessments are dependent on each other.

After the design of the assessment instrument is accomplished, the process moves on to "Develop instructional strategies". In this element, four major components consisting of pre-instructional activities, content presentation, learner participation (including feedback) and follow-through activities make up the instructional strategy component. Dick et al. strongly recommend that instructional strategies must focus on memory and transfer skills. The instructional designer, while considering learning theories, should also decide the medium for instructional delivery including lesson interactivity.

The next step is to "develop and select instructional material". Depending on the lessons taught and the available supporting resources, instructional materials function as an important resource for knowledge and skills. Learners are encouraged to engage actively with the instructional material. By the end of this phase, the designer should have draft copies of materials, assessments and instructor manual. The designer can continue revising and improving lesson materials during the evaluation process, which is in the following step of the model.

Once instructional materials have been selected, the next task of the designer is to design and conduct formative evaluations. Gustafson and Branch (2002) argue that the process of designing and conducting formative evaluations can help assess the value of the instructional goals. Three types of evaluation are recommended in the process, one-to-one evaluation, small group evaluation and field evaluation (Dick, et al, 2001).

After the formative evaluation is administered, the process moves on to the stage of revising instruction based on the result of the evaluation. Data collected from formative evaluations is used for instruction revision. This is the final step of the design process, but it also functions as the first step for the interaction process.

The last step of the model is to design and conduct summative evaluation. According to Dick et al (2001), the summative evaluation is a stand-alone evaluation for examining instructional effectiveness; therefore, it is not attached to the nine basic elements of the systems approach model. Moreover, it is also not an integral part because the designer is not involved in this process.

The above descriptions clearly indicate the linear form of the Dick and Carey model. Each process functions as an input for the next. Dick et al. (2001) place a strong claim that this systematic approach of the model is effective because of its essential emphasis on learners' objectives and final achievement prior to the planning and implementation stage. Additionally, there is also a careful linkage between instructional strategy (targeted skills and knowledge) and desired learning outcomes (appropriate conditions must be supplied by instruction). The final and most important reason is the replicable and pragmatic design process where the product is usable for many learners and for different occasions; time and effort revising the design product during the evaluation and revision process is recommended.

The instructional models reviewed above have been widely adapted as guidelines for the design of instructional systems either for classrooms or workplaces. In addition, these models can also be adapted for the design of online

instruction. An example of this adaptation is the SREO Plan (Suppasetseree, 2005), as will be described in the following section.

The SREO Plan

The Suppasetseree's Remedial English Online (SREO) Plan, as illustrated in Figure 2.7, was designed by Dr. Suksan Suppasetseree in 2005. It is an Internet-based instructional model for teaching Remedial English to first-year students at Suranaree University of Technology. As described by Suppasetseree (2005), the SREO Plan was designed from the derivations of various classic instructional models such as, Kemp et al (1971), Klausmeier and Ripple (1971), Gerlach and Ely (1971), and Dick and Carey (2001)

The SREO Plan is comprised of six major steps, namely, analyze setting, construct prototype, produce instructional packages, test prototype, conduct teaching and learning activities, and conduct evaluation.

The first step is to analyze the setting. To begin designing any program of study, a survey is conducted to identify problems, needs, and expectations of learners. The obtained data is used as a framework for developing the curriculum of the program of study. At this stage, problem identification, needs assessment, and curriculum analysis are focused on.

The second step is to construct the prototype. This consists of eight sub steps: conducting prototype including writing objectives, identifying learners, selecting content, developing instructional modules, specifying teaching method and instructional media, identifying instructional environment, and identifying an instructional management plan and evaluation, respectively.

The third step is to produce instructional packages. The purpose of this step is to create learning activities based on the content associated with the learning objectives.
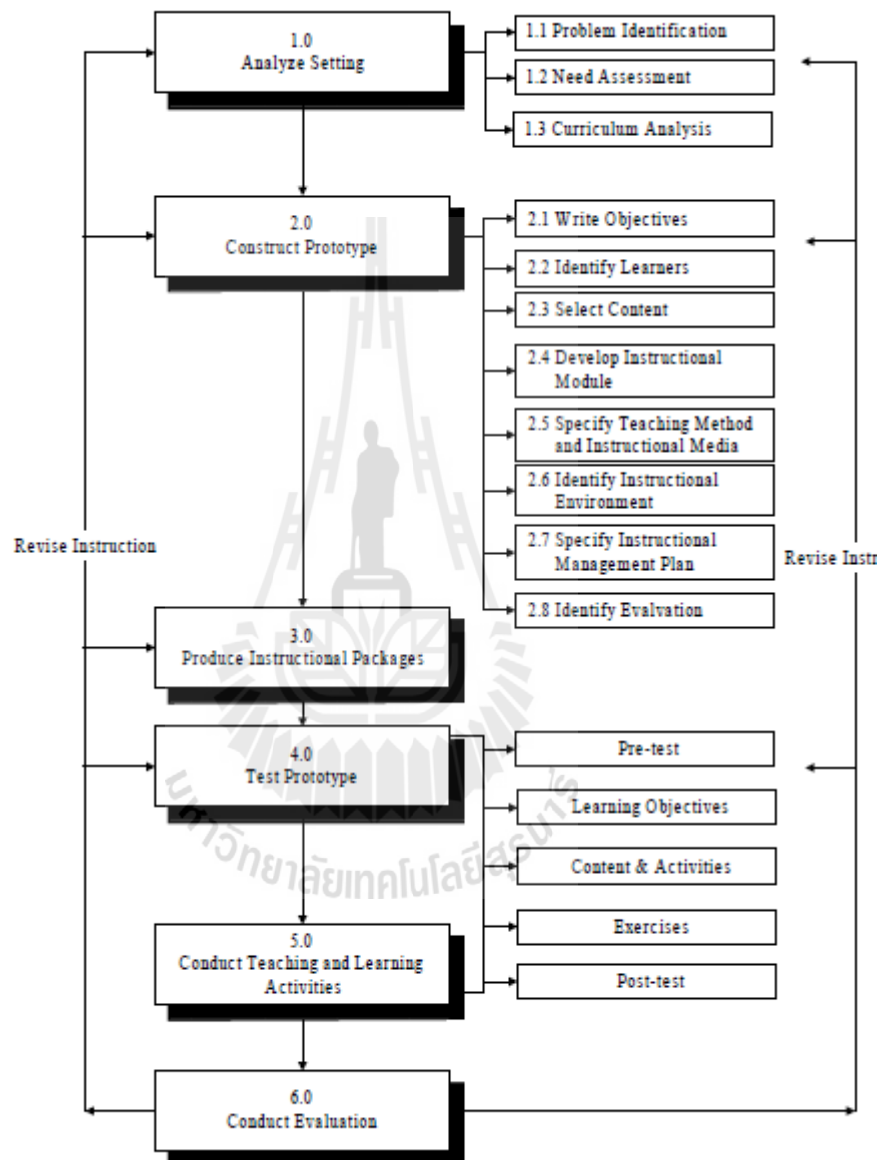
Figure 2.7 Suppasetseree's Remedial English Online (SREO) Plan

The next step is to test a prototype. This is a repetitive process that enables each step to be tested and evaluated until all the objectives are satisfied.

The fifth step is to conduct teaching and learning activities. The learning packages are delivered in a web-based form via the Internet and other on-line components such as web board and e-mail.

The final step is to conduct an evaluation and revision. In this step, students are observed for their use of the materials, and data is collected from student surveys. Eventually, the instructors analyze grades to determine what components of the class worked best.

From the classification and types of instructional models reviewed above, it can be seen that each type of model has distinctive characteristics and is context-specific. The Wiki-based Collaborative Reading (WCR) Instructional Model was designed in compliance with these key characteristics and the principles of the instructional models reviewed above. However, for an effective design of an instructional model, it is recommended that model designers take careful steps in designing each step or stage of the model. In Thai contexts, one of the most well-known procedures in the design of instructional models is the Seven-Step Model proposed by Brahmawong (1999), which will be discussed in the following section.

2.12 The Seven-Step Model for Prototype Development

Brahmawong (1999), an expert of e-learning and online education in Thailand, proposed a model for the development of research and design (R&D) and an instructional model prototype. This model is comprised of seven steps, which will be referred to as the Seven-Step Model for Prototype Development hereafter, as follows:

Step I: Review of related body of knowledge through documentary research (DR), interviews, field visits, and Internet searches on the R&D Prototype

Step II: Conduct a survey of need assessment on the R&D Prototype (First Survey)

Step III: Develop the Conceptual Framework of the R&D Prototype

Step IV: Make a survey of Experts' Opinions through questionnaires, Delphi Technique, or a focus group (Second Survey)

Step V: Develop the first draft of the R&D Prototype making use of the knowledge and information crystallized from Step I, II, and III.

Step VI: Seek Experts' Verification of the Prototype or Conduct Developmental Testing of the R&D Prototype: Tryout and Trial Run

Step VII: Revise and Finalize the R&D Prototype

According to the Seven-Step Model, the first step deals with gathering information concerning the design of related instructional models from other sources such as research studies, the Internet, and interviews with experts in the field of instructional design and language instruction. Once the literature review of related studies is completed, the next step (Step II) is to conduct a needs assessment in order to get in-depth information on the research topic for justification of the research proposal. It is highly recommended that a needs assessment be performed prior to developing a conceptual framework for the prototype of the proposed instructional model.

In Step III, the conceptual framework of the proposed instructional model (or prototype) is constructed by writing the concept, objectives, components, production

steps, technical attributes or characteristics, usages, and other relevant information to describe the proposed model. Then, the model's conceptual framework will be submitted to a panel of experts (such as the research advisor and teachers in the same field).

In Step IV, instruments for gathering experts' opinions on the proposed model will be developed and tried out. These instruments can be questionnaires; interview guides, observation forms, and so on. Then, a survey is conducted of experts' opinions using the developed research instruments and the opinions of the experts opinion are collected either via questionnaires (conventional or Delphi Techniques), or by using focus groups. After that, the survey report on the experts' opinions on the model will be summarized.

The next step (Step V) is to develop the first draft of the model and then submit the model's first draft to the experts to seek their opinions on the model. In accordance with the experts' opinions and comments, Step VI will be undertaken. In this step, the model will be revised and then a Three-Stage Trial will be administered (to be discussed in Section 3.2.5). After the try-out is completed, the conceptual framework of the model is revised and finalized (Step VII), and it can then be used as a model for the blueprint.

2.13 Summary

To sum up, this chapter has presented a review of the related literature, principles, and research studies relevant to the proposed study. It begins with the discussion of the three models of reading: bottom-up (code emphasis), top-down (meaning-emphasis), and interactive (combination of bottom-up and top-down

approaches). Then, the chapter moves on to the discussion of collaborative reading in facilitating reading comprehension. The following sections include collaborative learning (CL) and its five basic elements, the relationship between SLA and CL. Next, computer-assisted language learning (CALL) and computer-supported collaborative learning (CSCL) are explained, together with related research studies about the use of wikis in language instruction. At the end of the chapter, a review of classification and types of instructional models, and examples of models are presented. In the last section of the chapter, the Seven-Step Model for the development of a prototype is discussed.

CHAPTER 3

RESEARCH METHODOLOGY

The aim of this study is to develop a Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model) to encourage students' collaboration in order to accomplish reading activities. This chapter provides a detailed discussion about research methodology, participants, instruments, and data analysis.

3.1 Research Methodology

To answer the proposed research questions specified in Chapter 1, the present study employed a quasi-experimental method with a one-group pre-test and post-test design using quantitative and qualitative data analyses. Participants of this research were students taking the English III Course at Suranaree University of Technology (SUT), Nakhon Ratchasima, Thailand, in Trimester 2/2013. The textbook used in the course was "Read This! 2" by Mackey and Savage. The rationale behind the selection of the English III Course for the study was that the research aimed to investigate whether wiki-based collaborative reading lessons had effects on EFL students' reading skills, and the curriculum of English III placed its emphasis on promoting reading skills, which corresponded with the focus of the research.

3.2 Learning Context for the Present Study

As stated in 1.3 previously, English classes at SUT are divided into two weekly sessions: a tutorial session and a computer laboratory session. The tutorial session takes place in a normal classroom for two periods of fifty minutes, while the computer laboratory session lasts 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 Lessons (to be discussed in 3.7.4) created by the researcher following the course syllabus used in the other classes which followed traditional teaching methods.

3.3 Population and Samples

The population and samples of the present study were divided into two main groups: population and samples for the tryouts 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 the Wiki-based Collaborative Reading Lessons (WCR Lessons), the pre- and post-tests, and the questionnaire, while the experiment stage was conducted to measure the effects of the WCR Lessons on students' learning outcomes and satisfaction.

3.3.1 Population and Samples for the Tryout 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 three groups, one group of sixty-four students for the tryouts of WCR Lessons, another group of 120 for piloting the tests, and the last group of 30 students for piloting the questionnaire.

3.3.2 Population and Samples for the Experiment

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.

3.4 Research Design

As earlier stated in 3.3.2, the present study was conducted in the second trimester of the academic year 2013. Before the intervention, the researcher had designed the WCR Instructional Model and the WCR Lessons, and he had had them evaluated and tried out. WCR Lessons were used in the intervention to compare students' achievements in reading comprehension before and after participating in the online lessons. Furthermore, students' satisfaction and opinions towards WCR Lessons were also administered through a questionnaire and an oral interview after the experiment. Without a control group, the study employed a one-group pre-test and post-test design as shown in Figure 3.1. Moreover, the research design is illustrated in Figure 3.2.

> Group A   O1---------------X---------------O2
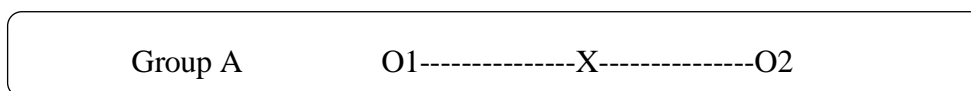
Figure 3.1 Diagram of the Research Design

X = an experiment variable, the effects of which are to be measured

O = the measurement obtained from a pre-test or a post-test
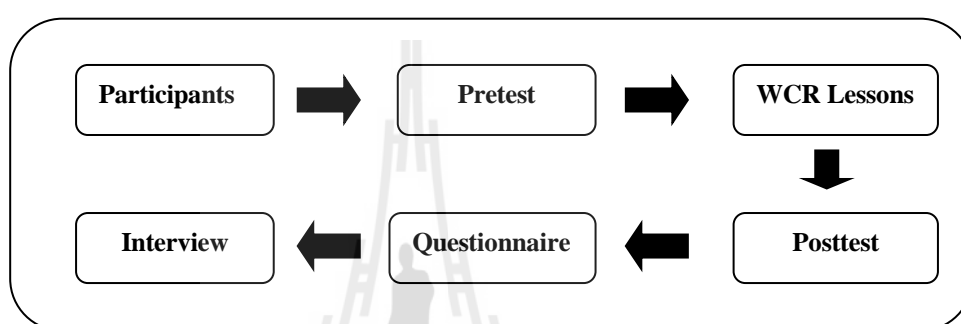
Figure 3.2 Research Design

3.5 Research Variables

The variables in this research were categorized into two main types: independent variable and dependent variables.

3.5.1 The independent variables included the WCR Instructional Model and the WCR Lessons.

3.5.2 The dependent variables were the effects of the WCR Lessons on students' reading comprehension, their interactions while doing the reading activities, and their satisfaction and opinions on the WCR Lessons.

3.6 Research Instruments

The research instruments utilized in the study included the WCR Instructional Model, the WCR Lessons, a reading comprehension pre- and post-tests, a questionnaire, and a semi-structured interview. Details about each instrument and how it was created and evaluated are discussed in Section 3.7.

3.7 Construction and Evaluation of the Research Instruments

This section presents detailed discussion about the construction and evaluation of the research instruments mentioned in 3.5 before they were administered in the experiment.

3.7.1 Development of Wiki-based Collaborative Instructional Model

The WCR Instructional Model is an instructional plan designed on a wiki-based website called "Pbworks" (www.pbworks.com) in combination with reading instruction. The model aimed to provide instructional guidelines to enhance students' use of reading comprehension strategies through collaboration with their peers while doing online reading tasks and activities on wiki. On the basis of Brahmawong's (1999) Seven-Step Model for R&D Prototype Development (hereafter referred to as "Brahmawong's Seven-Step Model)" discussed in 2.11 (p. 89), the development of the WCR Instructional Model was carried out as follows:

Step I: Review a related body of knowledge on the prototype of the WCR Instructional Model.

The researcher started the design of the instructional model by studying the curriculum of the English III Course at Suranaree University of Technology in order to ascertain the goals of the objectives of the subject.

Step II: Conduct a survey of needs assessment for the WCR Instructional Model.

The research conducted a review through previous in-house reports and research articles regarding the difficulties and challenges in reading instruction faced by instructors and students at Suranaree University of Technology.

Step III: Develop the conceptual framework of the WCR Instructional Model.

Once the study of the English III course syllabus and needs analysis were completed, the researcher developed a conceptual framework for the WCR Instructional Model prototype.

Step IV: Survey of experts' opinions and comments on the WCR Instructional Model.

After the model prototype was developed, it was submitted to three experts for evaluation and their suggestions or comments for further revision (if any). The procedure of evaluation of the WCR Instructional Model will be further discussed in Section 3.7.2.

Step V: Develop the first draft of the WCR Instructional Model prototype.

The researcher developed the initial draft of the WCR Instructional Model prototype using the results from Steps III and IV.

Step VI: Conduct the developmental testing of the WCR Instructional Model

The researcher conducted developmental testing of the WCR Instructional Model prototype. Changes and modifications were implemented after each phase.

Step VII: Revise and finalize the WCR Instructional Model.

Once the developmental testing was completed, and the final modifications and revisions were completed, the researcher finalized the WCR Instructional Model prototype.

3.7.2 Evaluation of the WCR Instructional Model

As mentioned in Step IV of Brahmawong's Seven-Step Model, the prototype of the WCR Instructional Model was evaluated and validated by three experts. In so doing, an evaluation form of the model (see Appendix D) was designed, and submitted to the experts. The first expert was a Thai full professor and a vice president at Bangkokthonburi University, and had actively been in the field of online learning and instructional system design for over forty years. The second and third experts were English language lecturers at Suranaree University of Technology, one of whom had been in the field of language teaching and reading instruction for over ten years while the other one was an expert in online instruction.

The evaluation and feedback obtained from the experts were analyzed for the revision of the model design. The process of the evaluation of the model was as follows:

(1) The evaluation form was constructed by the researcher using the five-point Likert's scale items.

(2) The evaluation form was submitted to the three experts.

(3) The evaluation, comments, and suggestions from the experts were analyzed and implemented for the improvement of the proposed instructional model.

(4) The WCR Instructional Model was revised in accordance with the experts' suggestions and comments.

3.7.3 The Lesson Plan

After the WCR Instructional Model was developed and evaluated by the experts, the researcher revised and finalized the model. Subsequently, a lesson plan for the WCR Lessons was designed by taking the following steps.

(1) The course description of English III was carefully studied, so that its objectives and expected learning outcomes could be followed.

(2) The lesson plan for online lessons and activities was designed in coordination with the course description of English III.

(3) The lesson plan for the online instruction was evaluated by the research advisor, who had extensive experience in teaching the course.

(4) The lesson plan was revised in accordance with the suggestions and comments of the experts.

Once the lesson plan was evaluated and improved, the process moved on to the design of the online lessons and activities, which will be discussed in the following section.

3.7.4 Wiki-based Collaborative Reading Lessons (WCR Lessons)

After the lesson plan had been designed and revised in accordance with the comments and suggestions of the experts, WCR Lessons were designed. The procedure of the design of online lessons and activities was as follows:

(1) An intensive review of the related literature on online collaborative learning and the use of wikis in language learning was conducted.

(2) PBworks website, a free wiki website, was constructed by the researcher to support the WCR Lessons.

(3) The utilization of useful features such as posting topics, adding members, posting comments, and activity tracking of the constructed wiki was elaborately studied.

(4) Lessons and activities for the English III Course that facilitates collaborative reading were designed on wikis.

(5) The online lessons were evaluated by the research advisor for content validity.

(6) The online lessons were revised in compliance with the suggestions of the advisor.

The next process was to conduct the Three-Step tryouts to the lessons. The objectives of the tryouts were to evaluate the efficiency of the online lessons, and to investigate potential problems in using wikis. The tryouts are discussed in the next section.

3.7.5 Determination of the Efficiency of the WCR Lessons (The Three-Step Tryouts)

After the proposed online collaborative learning model was improved and a lesson plan for the main study had been designed, the Three-Step Tryouts were performed to ensure the validity and efficiency of the lessons (Brahmawong, 2009). As the name suggests, the tryout was divided into three stages: Individual Testing, Small-group Testing, and Field-study Testing, respectively. Each stage was conducted with different groups of participants, who were requested to do the exercises on the wiki website and end-of-unit quizzes. Then, the 80/80 standard proposed by Brahmawong (1978) was employed as the criteria to evaluate the efficiency of the lessons for each tryout stage. 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 formulas for the computation of E1 and E2 are as follows:

$$E_1 = \frac{\overline{X}}{A} \times 100$$

Where E_1 = Efficiency of the process

$\overline{X}$ = Average score of all students achieved from the exercises

A = Total score of the exercises in the lessons

$$E_2 = \frac{\overline{F}}{B} \times 100$$

Where E_2 = Efficiency of the product

$\overline{F}$ = Average score of all students achieved from the tests

B = Total score of the test in the lessons

3.7.5.1 Individual Testing

Individual testing was the preliminary stage of the pilot testing. It was aimed to try out the lessons on a small group of students. In this stage, four students with different levels of English proficiency who were categorized into low-intermediate, intermediate, and high were recruited. The language ability of the students was graded according to their average cumulative grades of English I and English II Courses. Students whose average grades on the English courses were between A to B were be rated as high achievers, from C+ to C as intermediate achievers, and from D+ to D as low-intermediate achievers, respectively. It should be noted that the number of participants for Individual Testing in this study was slightly different from the general practice, as only three participants are required. This was because the study followed one of the principles of collaborative learning, which suggests that a collaborative group comprises of at least four members of different levels of abilities.

The four students were requested to participate in the online lessons and activities for ten fifty-minute periods. The scores of the students on the exercises and quizzes were calculated to determine the efficiency of the lessons based on the 80/80 standard. After that they were asked to give comments on the lessons. The comments were taken into careful consideration for the improvement of the lessons.

3.7.5.2 Small-Group Testing

The second stage of the pilot testing is called the Small-group Testing, of which the number of participants was larger than that for the Individual Testing. Sixteen participants were recruited for this stage. The participants were grouped into four heterogeneous groups, with each group containing students with at least two different level of language proficiency classified on the same basis as for the Individual Testing.

They underwent the same interventional procedure as for the Individual Testing. The outcomes of the students on the exercises and quizzes were calculated to determine the efficiency of the lessons based on the 80/80 standard. Subsequently, the students were asked to give comments and opinions on the WCR lessons. The information from this pilot stage played an essential role in the further improvement of the online lessons and activities.

3.7.5.3 Field-Study Testing

The final stage of the pilot testing was the Field-study Testing, which was conducted in Trimester 1 in academic year 2013 for ten fifty-minute periods. Forty-four participants were recruited for this tryout stage. The participants were later grouped into eleven heterogeneous groups of four students. The same procedure for intervention as in the two former tryout stages mentioned above was carried out.

After the participants completed all the WCR Lessons, they were asked for comments on the lessons. Moreover, the online lessons were evaluated for their efficiency on the basis of the 80/80 standard.

When the Three-Step Tryouts (Individual Testing, Small-group Testing, and Field-study Testing) were completed, the WCR Lessons and the wiki website were revised and improved for later implementation in the experiment. The process of the three stages of the pilot testing is shown in Figure 3.3.
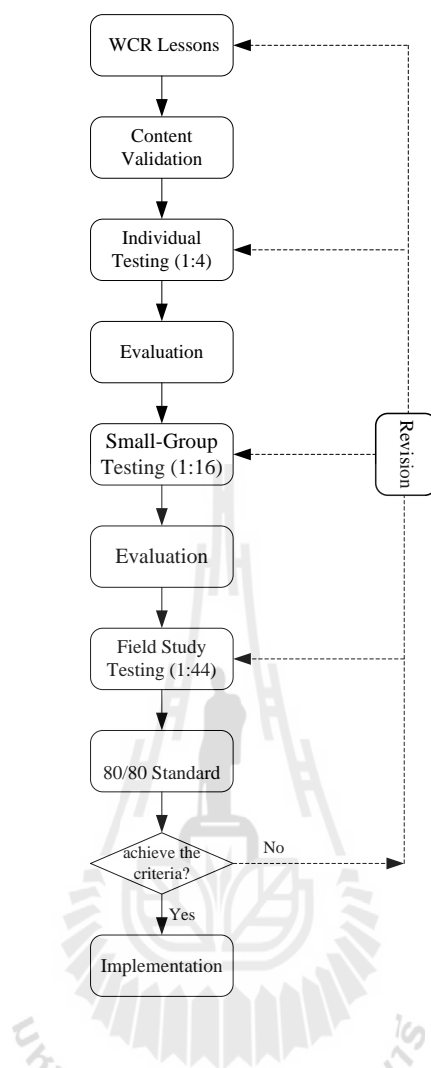
Figure 3.3 Procedure of the Three-Step Tryouts

3.7.6 English Reading Pre- and Post-Tests

A pre-test and a post-test were used to assess students' reading comprehension achievements before and after taking the WCR Lessons. The tests were constructed by the researcher and manipulated as parallel pre- and post-tests for the research participants. The design of the English comprehension tests was in accordance with the following procedure.

(1) The researcher carefully reviewed the description of the English III Course and contents in the course textbook and he focused on the reading activities.

(2) The researcher reviewed the literature on the design of tests for English reading comprehension.

(3) A test specification corresponding to the course objectives of English III was constructed.

(4) Test items for the reading tests were designed. In this study multiple-choice items with four alternatives were employed.

(5) A test item pool of 80 questions for the tests was generated by the researcher.

(6) All the questions were evaluated and content-validated by a lecturer of English III Course at SUT, who had had over ten years of experience in language instruction.

(7) The questions and test items were revised in accordance with the experts' comments and suggestions.

(8) The tests were tried out on 120 English III students in Trimester 1/2013 at SUT.

(9) An item analysis was later conducted on the piloted tests. Questions in the tests were individually analyzed for their difficulty level (p) and discrimination power (r) using the Item Response Theory (IRT) software developed by Kanjanavasi, Khaimook, and Wongwanit, lecturers at SUT. The criteria for the selection of the test items were $0.3 \leq p \leq 0.8$ and $r \geq 0.2$. In other words, the test items were considered acceptable if their level

of difficulty (p) was less than or equal to 0.8, but not smaller than or equal to 0.3 with the discrimination power (r) greater than or equal to 0.2. The formulas for the level of difficulty and discrimination power of the test are shown below.

Formula for the Level of Difficulty of the Test

$$p = \frac{R_H + R_L}{N_H + N_L}$$

p   =   level of difficulty of the test

R_H =   number of students who answer a test item correctly in the high group

R_L =   number of students who answer a test item correctly in the high group

N_H =   number of students in the high group

N_L =   number of students in the low group

Formula for Discrimination Power of the Test

$$r = \frac{R_H - R_L}{N_H + N_L}$$

r   =   discrimination power of the test

R_H =   number of students who answer a test item correctly in the high group

R_L =   number of students who answer a test item correctly in the high group

N_H =   number of students in the high group

N_L =   number of students in the low group

       (10) Forty test items that satisfied the criteria for p and r values mentioned above were selected for the pre- and post-tests, twenty items in each. Each test contained five different types of reading comprehension questions that measured students bottom-up and top-down reading skills. The bottom-up

reading comprehension questions aimed to measure students' knowledge of vocabulary and the use of referents. The top-down question types aimed to determine students' skills in identifying the main ideas and supporting ideas, and making inferences of reading texts.

(11) The internal reliability of the tests were examined using the Kuder-Richardson formula (KR-20), which ranges from 0-1, and the reliability is acceptable at KR-20 higher or equal to 0.7. The formula of KR-20 is expressed in the following equation.

$$\text{KR-20} \quad = \quad \frac{k}{k-1}\left(1 - \frac{\sum pq}{\sigma_1^{\,2}}\right)$$

KR-20 = internal reliability of the tests

k = the number of items on the test

p = the proportion of students who answer each item correctly

q = the proportion of students who answer each item incorrectly

$\sigma_1^{\,2}$ = the variance of the total score

(12) Both the pre- and post-tests were tried out on forty-four students to examine their internal reliability levels. The results showed that the internal reliability of the pre-test was 0.723, and of the post-test was 0.746 (see Appendix B). Both tests were considered to have acceptable internal reliability.

3.7.7 The Questionnaire

A questionnaire was used to investigate students' perceptions of doing the online lessons and activities via the wiki. 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. Regarding the second part of the questionnaire, the questions on the participant's satisfaction were designed according to the five-point Likert's scale items. The scale was assigned by the values 1 – 5, representing the following statements:

1 = "Strongly Disagree"

2 = "Disagree"

3 = "Neutral"

4 = "Agree"

5 = "Strongly Agree"

The construction of the questionnaire was according to the following procedure.

(1) The researcher reviewed the related literature and past research regarding the construction of questionnaires.

(2) The researcher generated questions on the basis of the research purposes and questions.

(3) The questions were carefully examined by the research advisor and another two experts for the validity of the questionnaire using IOC items.

(4) The questions were improved in accordance with suggestions and comments from the experts.

(5) The questionnaire was piloted with the participants in the field study testing.

(6) The internal consistency reliability of the piloted questionnaire was calculated using Cronbach's Alpha (α) coefficient. The pilot of the questionnaire with forty-four students showed that the reliability of the questionnaire was 0.798, which was considered as acceptable.

(7) Responses of the open-ended items were carefully analyzed and categorized.

3.7.8 The Semi-structured Interview

Interview, in terms of research, is defined as a directed conversation between an investigator and an individual or group of individuals in order to gather information (Nunan, 1989; Richards, Platt, and Platt 1992). It is an important tool in qualitative studies that helps the researcher to build his/her understanding of the research participants (Punch, 2005). Furthermore, interviews are also employed to probe in in-depth aspects of the participants' opinions or comments that the questionnaire alone may fail to cover.

Interviews can be broadly classified into three types: structured, semi-structured, and unstructured. Of the three types, Nunan (1992, p. 149) asserts that the semi-structured interview seems to fit best into qualitative designs. since they are flexible. Therefore, the semi-structured interview also gives the interviewee a degree of power and control over the course of the interview within the study focus.

In this study, a semi-structured oral interview was performed once the questionnaire had been distributed and responded to. The main objective of the interview was to elicit students' opinions, perceptions, and clarifications of their comments in the questionnaire. It was also used to triangulate the findings of the questionnaire. The semi-structured interview was carried out according to the following procedure.

(1) Guided questions for the interview were constructed by the researcher using data from the open-ended responses of the questionnaire. Moreover, some of the questions were from past research works in a similar field of study. The guided questions were assessed by three experts for validity using IOC items, which ranges from +1 to -1. If the average IOC score of an item is greater than 0.6, the item is considered to be acceptable; however, if the score is otherwise, the items needs revision.

(2) Ten students were selected as informants of the one-on-one interview. To prevent potential misinterpretation and unnecessary anxiety of the informants, the interview was administered in Thai. Also, for precision and further references of the interview transcription, the interview was digitally recorded with consent of the informants.

3.8 Procedure of the Experiment

The first week of the course was allocated for the students to get to know each other and to attend an orientation on the use of wiki. In this week the students were also divided into heterogeneous groups of four to five members with at least two different levels of language proficiency to work together throughout the 10-week experiment.

The main study lasted from Week 2 to Week 11 in the computer laboratory periods. The participants were assigned to do different tasks. While carrying out the tasks, their discussions and the extent of their interactions through posting on the wiki were observed. At the end of the course, a questionnaire on students' opinions was distributed to the participants, and a semi-structured interview was conducted with some of them to obtain in-depth information about their perceptions in using the wiki for language learning and their opinions of collaborative learning.

3.9 Data Collection

Data collection for this study was according to the following procedure:

(1) In the first week of the lesson, an orientation on the PBworks website and the WCR Lessons was organized for the participants. The pre-test was also conducted.

(2) From Week 2 to Week 11, the participants were assigned to do online group activities both in the computer laboratory sections and out-of-class time. The students' interactions, communications, collaboration and contributions in carrying out the assigned learning tasks were observed from the website's history.

(3) In Week 12, the post-test was administered, and the participants were requested to do the questionnaire afterwards.

(4) 10% of the samples (ten students) were selected for the interview after completing the questionnaire. Five of them were chosen from their open-ended responses in the questionnaire, and the other five were chosen at random from the rest. With the students' permission, the interview was audio recorded using a digital audio recorder. The recorded information was later transcribed verbatim.

3.10 Data Analyses

Prior to discussing the process of data analysis for the present study, the researcher would like to reiterate the research questions discussed in Chapter 1 in order to provide the rationale for the research design and to identify the variables to be studied. The proposed research questions are as follows:

(1) What are the components and logical steps in developing a Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model)?

(2) Does the efficiency of Wiki-based Collaborative Reading Lessons (WCR Lessons) to improve students' reading comprehension achieve the 80/80 standard?

(3) What are the effects of Wiki-based Collaborative Reading Lessons (WCR Lessons) on students' reading comprehension?

(4) How do students interact among themselves in completing the learning activities in Wiki-based Collaborative Reading Lessons (WCR Lessons)?

(5) What is the students' satisfaction with the Wiki-based Collaborative Reading Lessons (WCR Lessons) to improve their reading comprehension?

The data of the study included both quantitative and qualitative information as classified below.

Quantitative Data

The quantitative data of this study were as follows:

(1) the students' achievements in reading comprehension

(2) students' interaction and collaboration obtained from the wiki's history and discussion board

(3) Students' opinions from the closed-ended items in the questionnaire

Qualitative Data

The qualitative data of this study were

(1) students' interview

(2) open-ended students' comments and opinions from the questionnaire

3.10.1 Analysis of the Quantitative Data

As shown above, there were three types of quantitative data. Each was analyzed with different techniques and statistical methods, which will be described below.

3.10.1.1 Analysis of the Students' Achievements in Reading Comprehension

To examine the English learning achievement in the reading comprehension of the students, the differences in their scores in the pre- and post-tests,

a dependent-samples t-test were administered. The data was analyzed using SPSS, a computer software for statistical analysis.

3.10.1.2 Analysis of Students' Collaborative Interactions

The second quantitative data involve the students' online interaction and collaboration. In terms of online interaction, there have been a number of proper interaction analyses proposed for online interaction, namely, Henri's (1991) Model; Garrison's (1992) Model; and Gunawardena, Lowe, and Anderson's (1997) Model.

Regarding Henri's Model, online interaction is divided into five dimensions, namely, the social dimension, the interactive dimension, the cognitive dimension, the meta-cognitive dimension, and the participative dimension. However, this model has been criticized as being rather teacher-centered, and for its lack of clear distinction between dimensions (Gunawardena et al, 1997; Newman, 1995).

For Garrison's Model, the principle of learning interaction is considered to have a close connection with critical thinking. Garrison (1991) proposed that students' interactions be divided into five stages, which include problem identification, problem definition, problem exploration, problem evaluation and applicability, and problem integration. The model is closely related to the cognitive skills in Henri's Model (Garrison, 1992).

The third analysis model for online interaction, which is often referred to as the Interaction Analysis Model (IAM), was developed by Gunawardena et al. (1997) once they intensively reviewed the strengths and shortcomings of Henri's and Garrison's Models. The IAM is based on the premise that interaction is the process in which participants negotiate meaning and co-construct knowledge. Therefore, the model is more student-centered in comparison to the former two models presented

above. It also accommodates a large group of global online interaction with minimal presence of facilitators or teachers (Garrison, Anderson, & Archer, 2000).

In this study, the IAM was employed to analyze students' online interaction because the model fits one of the research objectives—to observe students' collaborative interactions on wiki with the teacher as a facilitator. The Interaction Analysis Model is explained as follows:

Details of the Interaction Analysis Model

Phase I "Sharing/ comparing of information."

This phase embraces five sub-stages from A to E.

A: A statement of observation or opinion

B: A statement of agreement from one or more other participants

C: Collaborating examples provided by one or more participants

D: Asking and answering questions to clarify details of statements

E: Definition, description, or identification of a problem

Phase II "The discovery and exploration of dissonance or inconsistency among ideas, concepts or statement." This phase consists of three operations as follows:

A: Identifying and stating areas of disagreement

B: Asking and answering questions to clarify the source and extent of disagreement

C: Restating the participant's position, and possibly advancing arguments or considerations in its support by references to the participant's experience, literature, formal data collected, or proposal of relevant metaphor or analogy to illustrate a point of view

Phase III "Negotiation of meaning/ co-construction of knowledge." This stage includes

five operations.

A: Negotiation or clarification of the meaning of terms

B: Negotiation of the relative weight to be assigned to types of arguments

C: Identification of areas of agreement or overlap among conflicting concepts

D: Proposal and negotiation of new statements embodying compromise, co-construction

E: Proposal of integrating or accommodating metaphors or analogies

Phase IV "Testing and modification of proposed synthesis or co-construction"

This phase consisted of five operations as follows:

A: Testing the proposed synthesis against "received fact" as shared by the

participants and/or their culture

B: Testing against existing cognitive schema

C: Testing against personal experience

D: Testing against formal data collection

E: Testing against contradictory testimony in the literature

Phase V "Agreement statement(s)/ applications of newly constructed meaning"

In this phase, three main accounts are present.

A: Summarization of agreement(s)

B: Application of new knowledge

C: Metacognitive statement by participants illustrating their understanding that

their knowledge or ways of thinking (cognitive schema) have changed as a

result of the conference interaction

Since the present study aimed to explore only holistic pattern of students' online interaction, only the major phase of interaction (i.e. Phase I to Phase V), not the sub-phases were addressed. To analyze students' online interaction, the researcher decided to use IAM. After that, an inter-rater in the field of content analysis was required to analyze the contents of the transcribed data. IAM was explained to the inter-rater , and how to obtain the data of students' interactions and collaboration from students' posts on the wiki pages. Later, it was explained how to count and categorize the IAM data according to the rubric provided. After that, the inter-rater carried out an analysis separately. Once the analysis was completed, individual ratings were analyzed for inter-rater reliability. Inter-rater reliability is a measure used to examine the agreement between two people (raters/observers) on the assignment of categories to a categorical variable.

3.10.1.3 Analysis of Students' Satisfaction from the Questionnaire

With regard to the students' satisfaction with the lessons and activities on wiki obtained from the questionnaire, since the data were in Likert's scale, they were analyzed using arithmetic means ($\overline{X}$). The mean values indicated the students' perceptions of online collaborative learning via wiki. To interpret the results, the opinions were divided into three ranges, namely, very favorable, favorable, and unfavorable, respectively. In dividing the ranges, the scale of 5 was reorganized using the formula:

$$\frac{max - min}{range}$$

max. = the highest value of the scale

min. = the lowest value of the scale

range   =   the number of range

Therefore, each range in the questionnaire had the value of (5-1)/4 = 1. The mean scores derived from this scale were classified as follows:

3.68 – 5.00 = strongly agree

2.34 – 3.67 = agree

1.00 – 2.33 = disagree

3.10.2 Analysis of the Qualitative Data

As stated above, the qualitative data covered the students' open-ended responses from the questionnaire and the interview. These two sources of data were analyzed using similar techniques of analysis as described below.

3.10.2.1 Analysis of the Open-ended Questionnaire

As stated in section 3.2.7, an open-ended question was provided in Part 3 of the questionnaire, asking about the problems and comments of the participant on the lessons and activities on the wiki. The data of this part were coded and categorized into themes. Then, they were analyzed to draw a conclusion to the findings.

3.10.2.2 Analysis of the Interview

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 more detailed picture of the findings.

In conclusion, in the present study, various types of research instruments were employed to gather both quantitative and qualitative information, which are summarized in Table 3.1.

Table 3.1 Summary of Research Instruments and Data Analyses

Research Questions	Instruments	Data Analysis
1. What are the components and logical steps in developing a Wiki-based Collaborative Reading Instructional Model?	• Evaluation from experts	• Experts' comments and suggestions
2. Does the efficiency of Wiki-based Collaborative Reading Lessons to improve students' reading comprehension achieve the 80/80 standard?	• WCR Lessons	• The 80/80 standard
3. What are the effects of Wiki-based Collaborative Reading Lessons on students' reading comprehension?	• Reading comprehension pre- and post-tests	• Dependent-Samples t-test
4. How do students interact among themselves to complete learning activities in Wiki-based Collaborative Reading Lessons?	• IAM Model	• Frequency counts • Categorization and frequency counts by two raters • Inter-rater reliability and correlation coefficient
5. What is the students' satisfaction with Wiki-based Collaborative Reading Lessons to improve their reading comprehension?	• Questionnaire • Interview	• Mean values • Axial coding and categorization

3.11 Summary

This chapter has provided a discussion about the research methodology and research design which includes the population and samples of the study, research procedures, variables, quantitative and qualitative data collection and data analysis. In addition, it has provided a detailed description of the construction and evaluation of the research instruments.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter presents the results and discussion of the present study with regard to the five research questions addressed in Chapter 1. The chapter is divided into two main sections: results and discussion, respectively. The first section presents the results of the data obtained from the evaluation of the Wiki-based Collaborative Reading (WCR) Instructional Model, the efficiency of the WCR lessons, the participants' achievements in the pre- and post-tests, and the information gained from the questionnaire and semi-structured interviews. In the second section, the results of the findings will be discussed in the order of the following research questions.

1. What are the elements in the development of the Wiki-based Collaborative Reading Instructional Model?

2. Does the efficiency of the Wiki-based Collaborative Reading Lessons meet the 80/80 standard?

3. What are the effects of the Wiki-based Collaborative Reading Lessons on the students' learning achievement?

4. How do students interact and collaborate between themselves in the accomplishment of the learning activities in the Wiki-based Collaborative Reading Lessons?

5. What are the students' opinions on the Wiki-based Collaborative Reading Lessons?

4.1 Results

4.1.1 Results of the Development of Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model)

WCR Instructional Model is an online instructional model using a wiki platform for English reading comprehension instruction. It is a learner-oriented instructional model that is aimed to promote students' discussion and collaboration. This model was designed by the researcher after rigorous reviews, analysis, and synthesis of all the three classifications of instructional models: product-oriented, classroom-oriented, and system-oriented, such as ADDIE (generic model), Seels and Glasgows (product-oriented), Morrison, Ross & Kemp Model (classroom-oriented), Dick & Carey Model, SREO Model, Saitakham Model, and Nutprapha BOLA Model (system-oriented). Thus, the Wiki-based Collaborative Instructional Model was eventually developed.

The WCR Instructional Model is comprised of six main steps: Analyze Learning Context; Specify Learning Objectives Mode of Instructional Delivery, and Teacher's Roles; Design Instructional Media and Modes of Evaluation; Produce and Conduct Developmental Testing of Instructional Module Prototypes; Implement Instructional Models; and Evaluate Instructional Models, respectively (see Chapter 5 for a full description of the model). The steps and sub-steps of the model can be briefly described as follow:

Step 1.0 Analyze Learning Context

    1.1   Analyze Students' Problems in English Reading Comprehension

    1.2   Analyze the Curriculum of English Courses at SUT

    1.3   Analyze Existing Classroom Contexts

Step 2.0 Specify Learning Objectives Mode of Instructional Delivery, and

    Teacher's Roles

    2.1 Specify Learning Objectives

    2.2 Specify Modes of Instructional Delivery

    2.3 Specify Teacher's Roles in Online Learning

Step 3.0 Design Instructional Media and Modes of Evaluation

    3.1 Design the Wiki-based Website

    3.2 Design Modes of Evaluation

        3.2.1 Analysis of Students' Online Discussion

        3.2.2 Evaluate Students' Reading Comprehension Achievements

Step 4.0 Produce and Conduct Developmental Testing of Instructional Module

    Prototypes

    4.1 Produce the Wiki-based Lessons

    4.2 Conduct Developmental Testing of Instructional Module Prototype

        4.2.1 Three-Step Tryouts

        4.2.2 Students' Online Interaction and Collaboration Tryouts

Step 5.0 Implement the Instructional Model

Step 6.0 Evaluate the Instructional Model

    6.1 Formative Evaluation

    6.2 Summative Evaluation

      When the WCR Instructional Model was initially developed, the model was later evaluated by three experts in the field of instructional system design and English language teaching. Through the evaluation form provided along with the model, the

experts rated and gave comments on the model for further improvement. The results of the evaluation are presented in the form of arithmetic means, as presented in Table 4.1 below.

Table 4.1 Results of the Evaluation Form of WCR Instructional Model

No.	Statement	Mean	SD
1.	Each component of the model is logically connected.	5.00	.000
2.	Each step of the model is clear and easy to understand.	4.67	.577
3.	The steps of the model are easy to implement.	4.67	.577
4.	Overall, the model is appropriate to be employed in teaching reading comprehension through collaborative learning on wiki.	4.67	.577
5.	In conclusion, the model is satisfactory.	4.67	.577

According to the results, Item 1 received the highest mean score ($\bar{x} = 5.00$) whereas the other four items received equal high mean values ($\bar{x} = 4.67$). The findings indicate that all the three experts strongly agreed that 1) WCR Instructional Model has logically connected components; 2) Each step of WCR Instructional Model is clear and easy to understand; 3) the steps of WCR Instructional Model are easily implemented; 4) WCR Instructional Model is practical for reading instruction through collaborative learning activities; and finally, 5) the model is satisfactory.

4.1.2 Results of the Three-Step Tryouts for the Efficiency of Wiki-based Collaborative Reading Lessons

The efficiency of the WCR Lessons were evaluated in two main phases: tryouts and trial run. The objectives of the tryouts were to evaluate the efficiency of WCR Lessons (lessons, learning activities, and quizzes and tests), whereas the trial run aims to evaluate the efficiency of the instructional components of the main study. The Three-Step Tryouts comprised three stages, namely, 1) Individual Testing; 2) Small-Group Testing; and 3) Field-Study Testing. To determine the efficiency of the lessons, the

80/80 Standard (Brahmawong, 1978) was used as the criterion. After each stage of the tryout was completed, the organization of the lessons and learning activities as well as the quizzes were revised in accordance with the results on the basis of the 80/80 Standard and comments of the students. To reiterate about the 80/80 Standard, the figures are the set criteria in percentage of the efficiency of exercises and quizzes in the WCR Lessons. The former 80 refers to the percentage of students' learning processes (performances on exercises) whereas the latter 80 refers to their learning product (performance on the end-of-unit quiz). The results of each step of the tryouts are discussed in the following sections.

4.1.2.1 Results of the Individual Testing

Table 4.2 Results of Individual Testing for the Efficiency of WCR Lessons

Tryout Step	Learning Unit	E1	E2
Individual Testing	1	79.17	77.50
	2	75.83	72.50
	3	76.67	75.00

The first step of the tryout was called Individual Testing. In this stage, four students with three different levels of English proficiency determined by their study grades of the past two English courses at SUT were used. The levels of language proficiency were classified as high-achiever, moderate-achiever, and low-achiever, respectively. Therefore, the participants of the Individual Testing included one high-achiever, two moderate-achievers, and one low-achiever. The results of the efficiency of the process (exercises) and product (end-of-unit quiz) for the Individual Testing are presented in Table 4.2.

According to Table 4.2, the average scores of E_1/E_2 of each learning unit from Unit 1 to Unit 3 were 79.17/77.50, 75.83/72.50, and 76.67/75.00, respectively;

therefore, none of the lessons or end-of-unit quizzes satisfied the 80/80 Standard at this stage. This was because some of the contents and exercises in the lessons did not cover the learning objectives. Moreover, according to the students' comments, there were some difficulties that hindered them in taking the online lessons, doing exercises, and quizzes. Firstly, the lessons did not provide sufficient guidance and support for them to carry out the reading tasks and exercises. For example, the amount of vocabulary in the vocabulary lessons was too small. So, they did not engage in enough practice of the words that could help them comprehend the reading texts. Therefore, they achieved low scores for both their learning processes (E_1) and products (E_2). Secondly, the instructions in doing some activities were not clear. Furthermore, the sequence of the activities was not logically organized.

In accordance with the students' comments, revisions and modifications of the WCR Lessons were carried out. First, more lexical items were added in the vocabulary practice parts to help students acquire more words that could help them understand texts. Secondly, instructions of activities and exercises were modified with clear explanations. Another change included the rearrangement of some activities, so that the lessons had a more logical connection.

4.1.2.2 Results of the Small-Group Testing

The second stage of the tryout was the small-group testing. In this tryout sixteen students with three different English proficiency levels participated . The results of the tryout are shown in Table 4.3.

Table 4.3 Results of Small-Group Testing for the Efficiency of WCR Lessons

Tryout Step	Learning Unit	E1	E2
Small-Group Testing	1	80.83	79.05
	2	80.21	78.13
	3	79.17	77.25

The second stage of the tryout was the small-group testing. In this stage, sixteen students with three different English proficiency levels participated. As illustrated in Table 4.3, the E_1/E_2 scores of the participants of the three units were 80.83/79.05, 80.21/78.13, and 79.17/77.25, respectively. Obviously, only lesson in Unit 1 met the 80/80 Standard, while the rest did not. However, the increase in E_1/E_2 scores in comparison with those of the Individual Testing indicate an improvement of the efficiency of both the process and product of learning. According to the students' comments and the interviews, the lessons on identifying main ideas, topic sentences, and inferences of the texts should provide more details and exercises. Most of the participants reported having difficulty in answering these types of questions in the quizzes. In these regard, the researcher added more details and explanations in the parts about identifying main ideas and making inferences on the reading texts. Also, there were some changes in the organization of the website, such as web linking, page formats, and theme of the website.

4.1.2.3 Results of the Field-Study Testing

The last stage of the tryout is called Field-Study Testing, in which forty-four students participated. The students were divided into eleven groups of four students with three different language proficiency levels. Each group was required to have one high-achiever, one or two moderate-achievers, and one or two low-achievers.

Table 4.4 Results of Field-Study Testing Step for the Efficiency of WCR Lessons

Tryout Step	Learning Unit	E1	E2
Field-Study Testing	1	81.74	81.40
	2	81.60	81.23
	3	80.40	80.00

As shown in Table 4.4, the total E_1/E_2 scores of Field-Study Testing of the learning units were 81.74/81.40, 81.60/81.23, and 80.40/80.00, accordingly. The results, therefore, indicate that the efficiency of the lessons of all units met the 80/80 Standard. In other words, the lessons, exercises, and quizzes proved to be sufficiently efficient to implement in the main study. Changes and revisions of the WCR Lessons in the Three-Step Tryouts are summarized in Table 4.5.

Table 4.5 Summary of the Revision of the Three-Step Tryouts

Stage 1 After the Individual Testing	Stage 2 After the Small-Group Testing	Stage 3 After the Field-Study Testing
1. Some contents of the lessons were improved with more details and with clearer explanations	1. Lessons and exercises on finding main ideas, topics, and inferences of reading passages were added with more explanations.	1. Some changes were made to the look and functionality of the wiki website.
2. Vocabulary lessons were revised to provide larger vocabulary lists and vocabulary exercises related to the reading passages.	2. The website was improved to have consistent pattern, theme, and correct internal links.	-
3. Instructions in doing the activities were modified to provide clearer information and procedures.	-	-
4. Separate group pages in the wiki website were added to enable studentsto do the group work more easily.	-	-
5. Contents and lessons were rearranged to have a more logical connection.	-	-

In summary, before the main study was conducted, the Three-Step Tryouts were administered to determine the efficiency of the WCR Lessons using the 80/80 Standard, proposed by Brahmawong (1978), as the criteria. The tryouts started with the Individual Testing, where four students with different levels of English proficiency participated in the online lessons, activities, exercises, and quizzes. The lessons were revised in accordance with the students' interviews and comments. Then, Small-group Testing was conducted with sixteen students arranged into four groups of four. The testing was carried out with a similar procedure to the Individual Testing. The results of this stage of the tryouts showed a higher efficiency level of the lessons, but still did not meet the set 80/80 Standard. The lessons and quiz were again revised and improved. Finally, the last stage of the tryout, the field testing, was carried out with forty-four students arranged into eleven groups of four. In this stage, the results demonstrated that the efficiency of the lessons met the 80/80 Standard. They were, hence, proved to be efficient and so they were implemented in the main study.

4.1.3 Results of the Efficiency of the Wiki-based Collaborative Reading

Lessons (WCR Lessons) of the Experiment

After the Three-Step Tryouts were carried out and the lessons were proved to be efficient, the lessons were later employed in the main study (alternatively called the "trial-run") with a group of ninety-five students. The results of the efficiency of the process (E_1) and the product (E_2) of the experimental class are shown in Table 4.6.

Table 4.6 Results of the Efficiency of the Wiki-based Collaborative Reading

Lessons (WCR Lessons) of the Experiment

Testing Step	Learning Unit	E1	E2
Experiment (Trial Run)	1	81.63	81.47
	2	81.75	81.38
	3	80.67	80.23

As shown in Table 4.6, the E_1/E_2 scores of the lessons in the three learning units were 81.63/81.47, 81.75/81.38, and 80.67/80.23, respectively. Clearly, the efficiency of all the exercises and quizzes met 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. This also answered Research Question 2, "Does the efficiency of the Wiki-based Collaborative Reading Lessons meet the 80/80 Standard?"

4.1.4 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 4.7 shows that the results of the students' overall reading comprehension in the pre- and post-tests.

Table 4.7 Results of the Students' Overall Reading Comprehension in the Pre- and Post-tests

Paired Samples Statistics				
	Mean	N	Std. Deviation	Std. Error Mean
Pretest	11.41	95	2.595	.266
Posttest	12.16	95	3.250	.333

As presented in Table 4.7, 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 4.8.

Table 4.8 Results of Paired Samples t-test for the Experimental Group

Paired Samples Test						
Paired Differences				t	df	Sig. (2-tailed)
Mean Diff. (pre-post)	SD	95% Confidence Interval of the Difference				
		Lower	Upper			
-.747	1.968	-1.148	-.347	-3.702	94	.000

Table 4.8 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 detail what reading comprehension skills the WCR lessons had an impact on, paired-sample t-tests were further conducted on five types of different reading comprehension questions: identifying main ideas, finding supporting details, making inferences, knowledge of vocabulary, and using 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 4.9.

Table 4.9 The Results of the Paired Sample t-tests of the Students' Reading

Achievements with Regard to Five Types of Comprehension Questions

		Paired Differences							
					95% Confidence Interval of the Difference				
Pair	Types of Questions	Mean	SD.	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	MI_pre - MI_post	-.232	1.115	.114	-.459	-.004	-2.024	94	.046
Pair 2	SD_pre - SD_post	-.242	.931	.095	-.432	-.053	-2.535	94	.013
Pair 3	Inf_pre - Inf_post	-.105	1.180	.121	-.346	.135	-.869	94	.387
Pair 4	Voc_pre - Voc_post	.063	.897	.092	-.120	.246	.686	94	.494
Pair 5	Ref_pre - Ref_post	-.263	1.169	.120	-.501	-.025	-2.194	94	.031

Note

MI = Identifying Main Idea   **Voc** = Knowledge of Vocabulary

SD = Finding Supporting Details   **Ref** = Using Referents

Inf = Making Inferences

The data in Table 4.9 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: knowledge of vocabulary and using referents were observed. In other words, the results demonstrate that the students outperformed in the posttests in identifying main ideas, 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 knowledge of vocabulary and using referents.

4.1.5 Results of Students' Interaction in Discussion Activities

To examine how students interacted and shared their knowledge with their groups in carrying out assignments in the three stages of reading process: pre-reading,

while-reading, and post-reading, students' posts in the discussion box provided by the wiki pages were analyzed. The pre-reading activities involved the preview of the topic of the passage to be read. The while-reading was about identifying key words, topics, main ideas, and supporting details of the passage. The post-reading activities asked the students to discuss what they had learned from the passage and how they were going to apply it in real life.

An analysis of students' interaction was performed using the following procedure. First, the students' posts were transcribed. Then, the transcription was duplicated and submitted to an inter-rater. Next, the students' transcriptions were analyzed using the Interaction Analysis Model (IAM) by Gunawardena, Lowe, and Anderson (1997), as presented in Table 4.10. Finally, an inter-rater reliability check was performed to examine the congruence of the analysis. Since the present study placed the primary focus on students' contribution to completing the group assignments, their posts concerning social dimensions such as greeting, complimenting, or small talks, were not taken into account. The results of the students' interaction are shown in Tables 4.11.

Table 4.10 Gunawardena, Lowe, and Anderson's (1997) Interaction Analysis

      Model

Phase	Coding	Types of Discussion
1. Sharing/ Comparing of Information	**Ph. I**	Statement of observation or opinion; statement of agreement among participants
2. Discovery and Exploration of Dissonance or Inconsistency among Participants	**Ph. II**	Identifying areas of disagreement, asking and answering questions to clarify disagreement
3. Negotiation of Meaning/ Co-construction of Knowledge	**Ph. III**	Negotiating meaning of terms and of the relative weight to be used for various agreements
4. Testing and Modification of Proposed Synthesis or Co-construction	**Ph. IV**	Testing the proposed new knowledge against existing cognitive schema, personal experience or other sources
5. Agreement Statement(s)/ Application of Newly Constructed Meaning	**Ph. V**	Summarizing agreement and metacognitive statements that show new knowledge construction

Table 4.11 Students' Overall Interaction during Online Discussion Activities

      Classified by Stages of Reading Process

Stage	Interactive Phase					Total
	Ph I	**Ph II**	**Ph III**	**Ph IV**	**Ph V**	
Pre-reading	721	132	84	31	84	1,052
While-reading	775	144	94	42	93	1,148
Post-reading	707	126	91	32	84	1,040
Total	2,203 (68.0%)	402 (12.4%)	269 (8.3%)	105 (3.2%)	261 (8.1%)	3,240 (100%)

Table 4.11 shows the frequency and percentage of the five interactive phases generated by the 20 groups of the students in the discussion activities in the WCR Lessons. Of the five phases, the phases in which discussion was generated with the

highest number is Phase I: Sharing/ Comparing of Information, accounting for 68.0%
(2,203 posts) followed by Phase II: Discovery and Exploration of Dissonance or
Inconsistency among Participants, at 12.4% (402 posts). The phases that achieve merely
similar amount of posts are Phase III: Negotiation of Meaning/ Co-construction of
Knowledge, which receives 8.3% of the posts, and Phase V: Agreement Statement(s)/
Application of Newly Constructed Meaning, at 8.1% (261 posts). The phase in which
students' discussion took place least is Phase IV, in which as little as 3.2% or 105 posts
were generated.

The descriptive data in percentages reveals that there were differences in the
types of students' of discussions across different interactive phases. To further
investigate whether patterns of the types of students' discussion in each interactive
phase were similar in regard to activities in the pre-, while-, and post-reading
activities, a chi-square test was performed. The results of the chi-square test are
displayed in Table 4.12.

Table 4.12 The Results of the Chi-square Test of Pattern of Types of Students'

Discussion in Activities in the Three Stages of Reading Process

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.582[a]	8	.991
Likelihood Ratio	1.566	8	.992
Linear-by-Linear Association	.119	1	.730
N of Valid Cases	3240		

The results in Table 4.12 show that there were no significant differences in
patterns of students' types of discussion across all the three stages of reading (χ^2 =
1.582, df = 8.0, p > .05). This finding reveals that the proportions of the types of

students' discussions were not statistically different in the Pre-, While- and Post-reading activities.

In addition to investigating the pattern of the types of students' of discussions in different stages of the reading process, the present study aimed to explore the relationship between the amount of teacher's facilitation and students' discussions throughout the lessons. As a result, a Spearman's rank correlation analysis was conducted. Descriptive data of students' interaction and teacher's facilitation in terms of learning units in the WCR Lessons are shown in Table 4.13 whereas the results of the relationship between teacher's facilitation and students' discussion are shown in Table 4.14.

Table 4.13 Descriptive Data of Students' Discussion and Teacher's Facilitation
with Regard to Learning Units in the WCR Lessons

Unit	Interaction		Total
	Students' Discussion	Teacher's Facilitation	
Unit 1	1,021	302	1,323
Unit 2	1,085	282	1,367
Unit 3	1,134	266	1,400
Total	3,240	850	4,090

According to Table 4.13, it will be seen that the amount of students' discussion increased whereas the amount of teacher's facilitation decreased as the students proceeded to the following learning unit. To confirm this relationship statistically, Spearman's rank-order correlation coefficient analyses of students' interaction and teacher's facilitation in comparison with the processing of the learning units in the WCR lessons were performed, as illustrated in Table 4.14.

Table 4.14 The Results of Spearman's Rank-order Correlation Coefficient

       Analysis between Students' Interactions and Teacher's Facilitation

       according to the Units of Learning

Spearman's rho		Students' Interaction	Teacher's Facilitation
Students' Interaction	Correlation Coefficient	1.000	-1.000[**]
	Sig. (2-tailed)	.	.
	N	3	3
Teacher's Facilitation	Correlation Coefficient	-1.000[**]	1.000
	Sig. (2-tailed)	.	.
	N	3	3

Table 4.14 indicates that there is a strong negative correlation between the amount of students' interactions and the teacher's facilitation by units of learning. This can be interpreted to mean that the amount of students' interactions in carrying out reading activities increased, whereas the amount of teacher's facilitation decreased as the students advanced to the next learning unit in the WCR Lessons.

4.1.6 Results of the Questionnaire

To investigate students' perceptions in taking Wiki-based Collaborative Reading Instruction Lessons (WCR Lessons), a questionnaire was administered to all 95 students. The questionnaire was comprised of two main parts. The first part was intended to obtain students' demographic information and experiences in collaborative learning and visiting wiki-based websites. The second part was divided into two sections. The first section comprised 22 five-point Likert scale statements and one open-ended question at the end. The Likert scale part was intended to investigate students' perceptions of taking the WCR Lessons. It was divided into three categories. The first category (Items 1 – 13) dealt with students' satisfaction with collaborative learning in the WCR Lessons. The second category (Items 14 – 17) asked about

students' satisfaction with the WCR website. The last category (Items 18 – 22) dealt with the impact of the WCR Lessons on students' English reading comprehension skills. Finally, the last section was an open-ended question that aimed to get additional opinions and suggestions from the students on the WCR Lessons.

The following sections of the chapter discuss the results of each part of the questionnaire. A descriptive analysis including frequency, percentage, and mean values will be presented to explore students' level of satisfaction with different aspects of the WCR Lessons.

4.1.6.1 Students' Demographic Information, Experiences in

Collaborative Learning, and Exposure to Wiki-based websites

The first part of the questionnaire asked for students' demographic information. It asked about students' general information which included the following data: gender, age, major, year of study, previous grades of English courses at the university, experiences in collaborative learning, and exposure to wiki-based websites.

According to the questionnaire, of the 95 students, 68 of them were female students while 27 were male. Of all the participants, 91 of them (95.79%) were majoring in management technology, 68 female and 23 male students, whereas the other 4 students (3.21%), all male, were engineering students. The participants' ages ranged from 18 to 22 years. More than half of them (60%) were 19; around one third (32.6%) were 18, while the rest (6%) were 20, and only one student was 22.

With regard to students' experience in collaborative learning before taking the WCR lessons, only 17 students (17.9%) had some experience in collaborative learning, while the other 78 (82.1%) had not been exposed to this instructional

technique. This finding suggested that collaborative learning was a completely new concept for the majority of the students prior to taking the WCR Lessons.

In terms of exposure to wiki-based websites, the top three wiki-based websites that were referred to most by the students were Wikipedia, wikiHow, and Wikileaks, respectively. The first wiki website, Wikipedia, is one of the most popular online encyclopedias. The second, wikiHow, is a wiki-based community, consisting of an enormous database of how-to guides. The third, wikileaks, is a wiki-based, non-profit, journalistic organization which publishes secret information, news leaks, and classified media from anonymous sources. Interestingly, the findings suggested that all of the students (100%) reported having visited Wikipedia. Moreover, some students (12.6%) reported having visited either wikiHow or wikileaks other than Wikipedia. However, only a small number of the students (5.3%) reported having visited all of the three popular wiki-based websites.

4.1.6.2 Students' Perceptions in Taking the WCR Lessons

The second part of the questionnaire involved an investigation of the students' perceptions on taking the WCR Lessons. As described above, this part was divided into two subsections. The first subsection contained 22 five-point Likert scale items and the second subsection was an open-ended question.

The first subsection was comprised of 22 five-point Likert scale items classified into three headings, namely, students' satisfaction with WCR Lessons, students' satisfaction with implementing the website, and the impacts of the WCR Lessons on their reading comprehension skills. The data obtained from the five-point rating scale were calculated for the arithmetic means ($\bar{X}$), and were later interpreted on the basis of the following criteria:

3.68 – 5.00 = strongly agree

2.34 – 3.67 = agree

1.00 – 2.33 = disagree

The data of each heading are discussed below.

4.1.6.3 Students' Satisfaction on the WCR Lessons

The first heading of this subsection investigated the students' satisfaction with the WCR Lessons. The data obtained from items 1 – 13 of the questionnaire are shown in Table 4.15.

Table 4.15 Students' Satisfaction with the WCR Lessons

Statement	$\overline{X}$	SD
1. The WCR Lessons motivate me to work with my team in carrying out online assignments.	3.75	0.525
2. The WCR Lessons encourage me to share my opinions and comments with my team mates.	3.67	0.591
3. The WCR Lessons help me to express my opinions and feelings better in English during group discussion.	4.01	0.707
4. The WCR Lessons enable me to assess the progress of my group work.	3.75	0.668
5. I feel less nervous using English with my classmates when doing assignment on the WCR Lessons.	3.73	0.626
6. The learning objectives of the lessons in the WCR Lessons have been well-described.	3.66	0.538
7. The WCR Lessons help me to share and acquire ideas with my teammates.	3.75	0.564
8. I don't think that the WCR Lessons promote discussions.	1.81	0.589
9. Activities in the WCR Lessons cause conflicts among my team mates.	2.02	0.785
10. Students in the group do not make much contribution for the group in doing online activities.	1.89	0.555
11. Collaboration on the website promoted responsibility among my group members.	3.48	0.562
12. The instructions of the activities in the WCR Lessons are clear.	3.66	0.612

According to the data shown above, it can be seen that all items, except items 8, 9, and 10, contained positive statements. Considering the students' perceptions for each item, the students strongly agreed that the WCR Lessons encouraged them to work with their groups to complete the online reading activities ($\bar{X}$ =3.75). They also agreed that the online lessons motivated them to share opinions with their teammates in doing online reading activities ($\bar{X}$ = 3.67). Likewise, they strongly agreed that they could 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 strongly agreed that they felt less nervous using English to work on online assignments with their teammates ($\bar{X}$ = 3.73). They also agreed that the objectives of each WCR Lesson were clear and well-described ($\bar{X}$ = 3.66). Moreover, the students strongly agreed that WCR Lessons helped them obtain ideas from their teammates while doing group reading activities. Regarding Statements 11, 12, and 13, the students agreed that through online collaborations, group members demonstrated their responsibility in carrying out the group reading activities. Moreover, the participants agreed that the instructions in WCR were clear. In addition, the students strongly agreed that WCR Lessons motivated them to collaborate with their group members more ($\bar{X}$ =3.88).

Considering Statements 8, 9, and 10, respectively, the participants disagreed that the WCR lessons hindered group discussions ($\bar{X}$ = 1.81), or caused conflicts among group members ($\bar{X}$ = 2.02). Finally, they also disagreed that their teammates failed to contribute to the groups in carrying out group reading activities ($\bar{X}$ =1.89). The next subsection of the questionnaire will be discussed in the next section.

4.1.6.4 Students' Satisfaction with the WCR Website

The second category of this subsection (items 14 - 17) explored the students' satisfaction with the WCR website. This part asked about the user-friendliness of the website and the challenges the students encountered while doing online activities. The data of this subsection are shown in Table 4.16.

Table 4.16 Students' Satisfaction with the WCR Website

Statement	$\overline{X}$	SD
14. The contents in WCR Lessons are appropriate for my English language proficiency.	3.72	0.577
15. I don't have difficulties with posting my comments and opinions on WCR Lessons.	3.74	0.569
16. The WCR Lessons are user-friendly.	3.86	0.576
17. I don't find it difficult to participate in learning activities on the WCR Lessons.	3.89	0.535

The results shown in table 4.16 indicate that the students strongly agreed that WCR Lessons suited their level of English proficiency ($\overline{X}$ =3.72). The students also reported that they did not have difficulties in posting their comments and opinions on the website ($\overline{X}$ =3.74), and they found the website was user-friendly (3.86). Likewise, they also found that it was not difficult for them to participate in learning activities on the WCR Lessons ($\overline{X}$ =3.89). The last subsection of the second part of the questionnaire will be presented in 4.18.

4.1.6.5 The Impact of WCR Lessons on Students' English Reading

Comprehension Skills

The last category of the subsection (items 18 - 22) investigated the impact of WCR Lessons on students' English reading comprehension skills. The findings are shown in Table 4.17.

Table 4.17 Impacts of WCR Lessons on Students' English Reading

Comprehension Skills

Statement	$\overline{X}$	SD
18. The WCR Lessons help me improve my English reading comprehension.	3.84	.491
19. Activities in the WCR Lessons help me understand the main ideas of the texts I read.	4.01	.644
20. The lessons and activities in WCR Lessons increase my motivation to read English passages.	4.09	.527
21. WCR Lessons promote the use of reading strategies.	4.17	.519
22. The lessons and activities in WCR Lessons help improve my English reading comprehension skills.	4.27	.515

The findings suggests that the students viewed WCR Lessons as helping them improve their English reading comprehension ($\overline{X}$ =3.84). Moreover, they strongly agreed that activities in WCR Lessons assisted their understanding of the main ideas in the reading passages in the assigned online reading activities ($\overline{X}$ = 4.01), and the activities also raised their motivation in reading English passages ($\overline{X}$ =4.09). Moreover, the students strongly agreed that WCR Lessons encouraged them to use reading strategies learned in the classroom ($\overline{X}$ = 4.17) as well as helping them improve their reading comprehension skills ($\overline{X}$ =4.27).

4.1.6.6 Open-ended Responses of Students' Opinions and

Suggestions for WCR Lessons

The last part of the questionnaire was a question with an open-ended response to let the students provide additional opinions and suggestions, apart from the 22 items provided. This part was optional for the students. Nevertheless, as many as 45 responses were provided. The responses were later coded and categorized into 3 types, namely, promotion of the use of English, enhancement of reading comprehension skills, and more positive attitudes towards collaborative group work.

Students' Increased Confidence in the Use of English

Interestingly, nearly 70% of the respondents stated that WCR Lessons promoted the use of English language more than in a face-to-face setting. They were encouraged to use the language for discussion with their teammates in carrying out reading activities without feeling nervous. /Some examples of the responses are as follows:

S3: *"I think I felt more confident in using English to work with my teammates."*

S6: *"I also used a lot of English in doing the lessons."*

S23: *"I was more confident to use English to work with my friends."*

S32: *"It was more relaxing and fun to talk with my teammates on the website in English."*

S41: *"At first, I was so worried to use English to work with my friends on the website. But later I was more relaxed. I became more and more confident to use English."*

Enhancement of Reading Comprehension Skills

The second main finding of the open-ended response question suggests that a considerable number of the respondents (30%) stated that WCR Lessons helped improve their reading comprehension skills. They gained some useful techniques in doing reading comprehension tests. Moreover, some of the respondents asserted that the lessons were fun and challenging in spite of some difficult content.

S2: *"They [the activities] helped me understand some techniques in doing English reading comprehension tests."*

S15: *"I liked the activities. They were interesting."*

S18: *"Before this course I had always thought that reading comprehension in English was very difficult. But this course provided me useful techniques in reading in English."*

S26: *"Some activities were easy, but some were difficult. But, I think I like them. They helped me understand how to read in English better. I think they will be useful for me in English 4."*

More Positive Attitudes towards Collaborative Group Work

The third main finding reveals that some respondents had more positive attitudes towards doing collaborative group work. They stated that while they were still at school, they were always bored when assigned to do group work. This was because they viewed traditional group work as workload allocated to only some members in the group, which they considered unfair. However, after taking WCR Lessons, their attitudes towards group work in collaborative learning became more positive. This was due to the fact that there are clear measures to monitor the so-called "free loaders" of

the group. The teacher was able to check who were working on the assigned activities and who were not.

> *S5:* *"Before this course, I had not thought that group work would work for English classes because workload would go for particular students in the group. But in this course, it was different. Students had different roles and they helped each other. I like it."*

> *S7:* *"I enjoyed working and discussing with my teammates to find answers to the questions in the lessons. Working in group helped me learn to work in team."*

> *S45:* *"The exercises and lessons on the website were challenging and required a lot of brainstorming with my friends to work on them."*

To sum up, the open-ended responses of the students revealed a great deal of insightful information which can be classified into three categories. The first category of the responses shows that some students viewed WCR Lessons as promoting the use of English. The second finding demonstrates that some respondents thought that WCR Lessons helped them improve their reading comprehension skills. Finally, the students also reported having more positive opinions towards doing group work. The respondents admitted that before taking this English course, they had had a negative stance towards group work which they perceived as being a burden for only some particular members in the group.

4.1.7 Results of Semi-structured Interviews

This section discusses the findings obtained from the semi-structured interview, which was designed in order to draw more in-depth information such as opinions,

comments, or other additional ideas apart from the questionnaire. Ten participants were randomly selected from all the 95 students in the experiment. A set of ten questions was formulated to go with the questionnaire and it was administered at the interview. The interview was carried out on a one-to-one basis lasting for 10-15 minutes each. In order to minimize misinterpretation and ambiguity, the interview was conducted in Thai, the native language of the students. To ensure the accuracy of the transcription and for future reference, all the conversations of the interviews were recorded with a digital recorder. the findings of the interviews, which will be presented in the order of interview questions, are as follows.

Question 1: Did you learn about reading strategies before this course? If so, please explain how they were taught.

This question aimed to obtain information about the students' experiences in using reading strategies prior to taking the present English course. Their opinions are grouped and presented below.

(1) Interestingly, most of the students (60%) said that they were not taught much about reading at school, so they didn't know exactly what reading strategies were and how to use them.

S1: *"I'd say that I didn't know what reading strategies were before taking this course. ... At school, reading lessons were not the main focus. They taught us grammar and vocabulary, but very little about reading."*

S4: *"Before this course I had no idea what reading strategies really were, and when to use them. I was taught very little about reading at school. I think vocabulary was the main focus."*

S6: *"We didn't learn much about reading. We just learned some grammar, conversations, and vocabulary."*

(2) Only a few interviewees (40%) stated that they were taught some reading strategies and learned how to use them at school.

S2: *"I learned about using connectors as a guideline of reading and guessing meaning of unknown words. I remember the teacher also taught me to make predictions from the title and pictures in the texts."*

S7: *"Yes, the English teacher taught me some reading techniques like word-tackling and finding main ideas of the texts. For predictions, the teacher asked me to guess what the text was going to be about. For word-tackling, the teacher asked me to divide a word into parts, root, prefix and suffix, and, things like that."*

Question 2: *Before this course, what did you usually do when you did English reading comprehension tests? Did you use any reading strategies?*

This question aimed to get information about the students' use of reading strategies in doing reading tests prior to taking WCR Lessons. Their statements are classified into two groups as presented below.

(1) According to the interview, eight interviewees stated that the strategies they used most in doing English reading comprehension tests were guessing meanings of unknown words and the use of sentence connectors like ' but, also, however, and because'. Also, two of them reported using skimming and scanning

techniques. Another three said that they tried to remember where the key words in the questions appeared in the texts.

> **S2:** *"I tried to guess meanings from word formation. I was taught to break down a long word into parts."*
>
> **S4:** *"I think I used guessing meanings of unknown words quite a lot most because vocabulary is always my problem in reading. And this was the only reading strategies I knew."*
>
> **S7:** *"I skipped the words I didn't know. I just read through the text, and then read the questions. I tried looking for key words and then went back to the paragraph where the key words were."*
>
> **S9:** *"I kept reading until I encountered an unknown word. Then, I'd try to guess from its root and suffix or prefix. If it didn't help, I went for the sentences around to help me work it out."*
>
> **S5:** *"I tried to look for repeated words because they could be key words of the paragraph. That helped me identify the main idea."*

(2) Two interviewees said that he just guessed the answers without using reading strategies.

> **S6:** *"I had no idea what reading strategies to use. I didn't even think of them. I just guessed the answers."*
>
> **S10:** *"I didn't use reading strategies a lot. I just guessed the answers."*

> ***Question 3:*** *Have you ever been involved in group work and group discussion in your English classes before? If so, how much English did you use?*

All of the students said that they had been assigned to do group work and group discussions in English classes when they were at high school. However, seven of them stated that they used very little English. Group discussions were mostly done in Thai.

> **S2:** *"Although it was a rule that everybody speaks English in classroom in English subjects, we still talked in Thai…. We mostly used Thai to discuss when doing group work because it was more convenient."*

> **S3:** *"Yes, we had some group works in English class at school. But we preferred to use Thai more than English. We felt shy to speak English with our friends."*

> **S5:** *"I used to do group work in my English classes at school. We used both English and Thai to discuss, but mostly in Thai."*

However, three students said they switched to discuss in English only in the presence of the teachers in order to avoid punishment such as score deduction or blame.

> **S1:** *"We mainly discussed in Thai, but when the teacher approached we just switched to English, pretending as if we were using English all the time."*

> **S6:** *"We discussed in Thai so that we could be sure everyone understood the same thing. Since it was a classroom rule that everybody speak English, we had to switch to English when the teacher was around or we could be blamed."*

S8: *"The teacher often pushed us to speak English in class even in group work. But most of the time we discussed in Thai unless the teacher was around or our scores might be deducted."*

Question 4: *How much English do you use in discussing with your teammates while doing the online tasks in WCR Lessons in comparison to when you were at high school?*

This question was asked in order to go further into the details of students' use of English in doing reading exercises in WCR Lessons when compared to that of group work at high school. The findings were as follows.

(1) Seven students stated that they used more English in group discussions to do reading exercises in WCR Lessons than when they were at high school.

S1: *"I feel that I used more English, although with alternation of some Thai, to discuss with my friends in doing exercises in WCR Lessons."*

S3: *"Although my English is not very good, I think I use more English to discuss with my team in WCR Lessons. It was more fun."*

S8: *"I think I used a lot of English in the WCR Lessons. Sometimes I used Google translation to help me with my English. On the Internet, we have a lot of tools to help with the language."*

(2) Three students responded that they did not think that they used English in WCR Lessons more than they did when they were at high school. However, they felt more relaxed in using English for discussion in the WCR Lessons.

S2: *"I think I used English as much as I did at high school. But I felt more comfortable and relaxed because it was not face-to-face communication. The teacher was not present either. I used English and Thai alternatively in discussions with my friends."*

S7: *"I usually use Thai more than English in doing group work. And in WCR Lessons, it was similar. However, I feel that I was more comfortable to use English in WCR Lessons than in the classroom, where lots of students are listening to you."*

S10: *"I'm not sure if I used more English in WCR Lessons. But one thing I feel is that I am more confident to use the language, although I don't use it a lot."*

Questions 5: *"What do you think of WCR Lessons and collaborative reading in comparison with normal reading classroom in which only the teacher takes control of the class?"*

This question aimed to obtain information about students' opinions on English reading instruction, in which the students worked in groups without the teacher's being present, in comparison with a normal teacher-led class. All the ten interviewees were more in favor of WCR Lessons than the traditional classroom, however, with different aspects as follows.

(1) Six interviewees stated that they liked learning through WCR Lessons because they could discuss with more freedom without the presence of other classmates and the teacher. However, they felt that the teacher as a facilitator was still necessary.

S2: *"Although it's a little strange to learn without the teacher, I like studying on WCR Lessons. It is like I have more freedom to make decisions, and to do exercises at will."*

S3: *"In WCR lessons, I am more confident to express my opinions because they are known within group members only. I know that sometimes my opinions don't sound reasonable, but I have more confidence to give them."*

S10: *"Studying in WCR Lessons was fun. It offers more freedom to learn. I was as stressed as in the classroom. But, I think it is still important to have the teacher help when we have problems or we need assistance."*

(2) Two students asserted that WCR Lessons and collaborative reading helped them understand how to read English passages more effectively.

S4: *"Although working in groups is not what I usually like, but with clear allocation of the duty of each member, everyone knows his role. And through collaborative reading, I learn quite a lot from my teammates."*

S6: *"WCR Lessons let me express my opinions, and sometimes I learned from my teammates' opinions as well. Everybody has a role to play in the group, so it's like we push each other to do our jobs. But in the classroom we may just sit passively."*

(3) Two students said they found WCR Lessons more interesting and challenging than a normal classroom setting.

S8: *"I felt that the exercises and contents in WCR Lessons are challenging. Besides, it is more convenient to do the exercises and submit them online."*

S9: *"WCR lessons are enjoyable and interesting. When I have some problems understanding the lessons I can just ask my teammates for help or even make a post to ask the teacher."*

Question 6: *"Do you use reading strategies learned in WCR Lessons when you discuss with your group members while reading the passages? If so, how?"*

The purpose of this question was to get information about whether the students use any of the reading strategies they they discussed with their groups in doing the exercises in the WCR Lessons. All of the students said that they used some of the reading strategies they discussed in their groups. The answers were classified into two groups as follows.

(1) Five students replied that they reminded the group members of reading strategies while doing the reading activities in WCR Lessons.

S2: *"While doing the reading activities, I sometimes reminded my teammates of some reading strategies such as looking for repeated words in the paragraph to identifying its main idea. But we usually help each other by reminding the group of the necessary reading strategies."*

S5: *"Yes, we thought of some of the necessary reading strategies we learned from the WCR Lessons such as looking for important*

connectors, or predicting from the titles. I think they help us in

understanding the passages."

S6: *"I'm sure that I learnt and used reading strategies in doing the*

exercises in the WCR Lessons because different lessons taught us

particular strategies. In the reading comprehension exercises, we

discussed a lot about what strategies are involved. Besides, it

becomes easier with the help of the teacher."

(2) The other five students said that they were not involved a lot in making suggestions about what strategies to use, but rather they learnt reading strategies from their teammates through group discussion.

S1: *"Honestly speaking, I am not so involved in showing ideas of what*

strategies to use. In contrast, I try to get ideas from my teammates

while we are discussing. I learn the techniques from them."

S4: *"I think I'm not really helpful in sharing ideas with my group. But I*

try to help them with other things like looking up unknown words. I

try to get some ideas of what reading strategies to use by reading the

conversations of the group's discussion."

(3) In addition to the two aspects of the findings presented above, one student also stated that while doing group work sometimes he had slight arguments with his teammates about a reading strategy: identifying the key words of the paragraphs in particular.

S2: *"Well, we sometimes have different ideas in identifying keywords of*

the paragraphs. It's not a serious argument, but through big

discussions we learnt something. "

Question 7: *"What do you like most and like least about WCR Lessons?"*

This question aimed to ask what students liked and disliked about WCR Lessons.

(1) Seven students stated that they liked the lessons and exercises best because they thought that the lessons and exercises helped them improve their reading comprehension skills.

> **S2***: "The lessons are great and very helpful. I think that I've learned quite a lot about reading skills and strategies. They make very effective complementary lessons to the textbook.*

> **S3:** *"The exercises, especially the vocabulary parts, are fun and helpful. They are very interesting."*

> **S5:** *"The lessons and exercises are the most interesting parts of WCR Lessons. I think they are more helpful than the textbook because they are more convenient. I don't have to carry the book. I can also visit the website anywhere by using the Internet."*

(2) Two students answered that rhe discussion parts were the most interesting in the WCR Lessons. They found them helpful in enhancing both their communication skills and reading skills.

> **S4:** *"The discussion parts are fun. We can help each other carry out reading activities and exercises. This helps improve my reading skills."*

> **S8:** *"I really enjoy the discussion part most. I think it widens my point of view by exchanging ideas with other students in the group, although we sometimes have an argument. Another thing is that I*

can improve my communication in English, even though we use

Thai occasionally."

(3) One student answered that he liked WCR Lessons because they offered freedom in learning and doing activities according to the students' interests. With freedom in learning, he felt more comfortable without the presence of the teacher and other students who were not in his group.

S1: *"We had more freedom in working with some teacher's help on demand. I think I feel more comfortable to discuss with my teammates in English without the presence of the teacher because I'm always shy to speak English in front of the teacher."*

Question 8: *"Which kind of reading, between reading alone and reading in a team with other students do you think can help you understand reading passages in English more? Why?"*

This question aimed to investigate what the students thought was the most effective method between collaborative reading and reading alone. The findings are shown below.

(1) Eight students said that they preferred reading in groups because they could help each other when they had problems understanding reading passages. Moreover, they could share ideas in analyzing the texts they read, especially when they did reading comprehension exercises.

S1: *"I think I prefer reading in a group with my friends because we can help each other when we are stuck over some unknown words or linking ideas between sentences or paragraphs."*

S2: *"I like to read in a group with friends. If I have a problem with the passages I can ask for help or explanation from them."*

S4: *"If I had a choice, I'd prefer reading in a group because we can share ideas and discuss reading problems we have. Also, it is more relaxing and not boring."*

(2) Two students said that it depended on the situations such as reading for pleasure or reading for tests. They said that in the former case they would prefer reading alone whereas in the latter they would prefer reading in groups.

S5: *"In fact I don't read in English much. But if I read for pleasure like reading news of my favorite music bands on the website, I prefer reading alone. But if I read for exams, of course I like to read in a group."*

S8: *"It depends on what I am reading for. If I read English magazines I read alone. But if I read for tests, I'd like to read in a group because it is more relaxing and less boring. When I have a problem about reading I can ask for help."*

Question 9: *"Do WCR Lessons change the way you used to read in English? How?"*

The purpose of Question 9 was to investigate whether WCR Lessons had any impact on students' behavior after the intervention when they read in English.

(1) Eight participants (80%) stated that WCR Lessons raised their awareness of the use of reading strategies such as predicting, identifying main ideas and supporting ideas, and making inferences to the texts.

> **S1:** *"Yes, they changed the way I read English texts. I have learned how to make references like linking pronouns, and possessives to the nouns they refer to, so that I don't get lost while reading."*
>
> **S3:** *"Yes, WCR Lessons helped me improve my reading skills. They changed my ways of reading. Before, I didn't care much about sentence connectors, or markers like 'although' and 'in addition', but now I know that they are really important. They provide guidance of how sentences are related. Also, I now don't use the dictionary a lot like before when I read in English."*
>
> **S4:** *"I think they change my way of reading. Before I tried to understand every word in the passage, but now I just try to get the main points by looking for key words, repeated words or pronouns that appear frequently in the passage. I also learn how to use some reading techniques such as the use of connectors to link ideas of the sentences or paragraphs."*
>
> **S6:** *"Before when I read, I didn't try to make inferences from the texts. I just read without thinking of the meanings that underlaid the texts. But I learned a lot from WCR Lessons in reading between the lines. Now, when I read I sometimes raise questions like how or what to do next, or why it was like that. It is really helpful."*

(2) Two participants stated that they did not only change their ways of reading English texts, they also had more positive attitudes towards reading in English.

> **S2:** *"WCR Lessons do not only change my way of reading, they also make me like to read in English more. Before, I just jumped into reading the given texts right away without using any techniques, and it turned out to give negative results. I couldn't get any of the points in the texts. But now I learned some useful techniques from the lessons like how to identify main ideas, how to use connectors to link ideas between sentences."*

> **S9:** *"Before taking WCR Lessons, I had no idea how to deal with reading English texts other than the use of a dictionary. I really hated it. But now I think that my attitudes towards reading English texts are much better. Now when I read, I try to know what the paragraph is talking about. I also pay more attention to the introduction paragraph because it tells me what the whole passage is going to be about."*

> ***Question 10:*** *"Do you have any suggestions regarding WCR Lessons and exercises?"*

This question asked students to give comments and suggestions about WCR Lessons. Their answers were grouped into two categories as follow:

(1) Three students (30%) made suggestions for more lessons and exercises in the parts of vocabulary, identifying main ideas and supporting ideas. They stated that the lessons and exercises were very helpful, so they thought it would be better if more of them were added.

S1: *"In my opinion, the vocabulary exercises are good, but there should have been more. They are very helpful."*

S3: *"I think there should be more contents and exercises about finding main ideas and supporting ideas. Also, the vocabulary part should be added to a bit."*

S5: *"I think the lessons are just good. I like them, but there should be more exercises on vocabulary."*

(2) Three students (30%) commented that there should be more explanation about the use of each reading strategy. They thought they were rather too short.

S6: *"I think everything was alright, but there should be more explanation and exercises on the use of reading strategies. That would be very useful."*

S8: *"I think it is very important that one knows how to use reading strategies. So, in my opinion, there should be more exercises or lessons on how to use them."*

S9: *"What I really liked about the lessons was the exercises about how to use reading techniques like finding main ideas by looking for key words and identifying small details. They are so helpful. So I think they should be more of these exercises. "*

4.2 Discussion

The findings of the study presented above showed that WCR Instructional Model and Lessons were effective for teaching reading comprehension for EFL university students. Discussions with regard to the research purposes and questions in Chapter 1 can be summarized as follows:

4.2.1 Discussion on the Findings of the Development of WCR
Instructional Model

As research in Thailand has revealed problems of students' reading comprehension, a great number of attempts have been made in order to solve such obstacles. A substantially teacher-centered instructional approach, where students have limited roles in reading classroom, is one of major causes of the problems. As a solution to the aforementioned difficulties, an appropriate instructional model for reading instruction called Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model) was developed. The model incorporated the principles of collaborative learning, which allows students to construct their knowledge through interaction and discussion with their peers, and a web 2.0 technology called wiki, which supports collaborative learning. After intensive reviews, analyses , and syntheses of all the three types of instructional models (classroom-oriented, system-oriented, and product-oriented) , such as the ADDIE Model; The Morrison, the Ross and Kemp Model; the Dick and Carrey Model; and the SREO Model, the WCR Instructional Model was created systematically in compliance with Brahmawong's Seven-step Model for R&D. The seven steps are as follows: 1) reviewing a related body of knowledge on the prototype of WCR Instructional Model; 2) conducting a needs assessment on the prototype; 3) developing a conceptual framework of the prototype;

4) securing experts' opinions on the prototype; 5) drafting the prototype for the model; 6) trying out the prototype; and 7) revising and finalizing the prototype.

As prescribed in Step 4 of the Seven-Step Model presented above, a prototype of the instructional model was designed and later submitted to three experts for evaluations and comments. The results of the evaluation suggested that all the experts approved the model as being "satisfactory and appropriate" for EFL reading instruction and capable of promoting students' interactions and involvement in learning ($\bar{x}$ = 4.67, SD = .577).

Pertaining to the other aspects of the model, the experts viewed the logical connections among the steps and sub-steps of the system as the strongest point of the model, hence rating the full band of 5.00 ($\bar{x}$ = 5.00, SD = 0.00) for this point. This was because the model was designed and developed on the basis of the principles of instructional system design (ISD) with delicate and profound analyses of various ISD models.

Next, since the model was comprised of six main steps and sixteen sub-steps, this could be viewed as being fairly complicated for novice instructional designers and teachers. Moreover, the integration of collaborative learning and wiki into reading instruction could be perceived as challenging since they are not so prevalent in normal Thai classrooms. As a result, it could be a demanding task for the teacher to employ this teaching technique and web application in the class. It might also take them sometime make the students understand and then to implement the model. Therefore, the three aspects of the model: easiness to understand, ease of implementation, and appropriateness for use in reading instruction, obtained an equally or slightly lower band level ($\bar{x}$ = 4.67, SD = .577) from the experts.

To summarize, WCR Instructional model was developed according to the principles of instructional system design (ISD) and the Seven-Step Model for R&D proposed by Brahmawong (1999), in combination with intensive reviews and analyses of several instructional models. Every step in designing and developing the model was carefully evaluated by three experts. In compliance with the experts' comments, the model was revised and eventually approved to have logical connections between its components, easy to understand and implement, and appropriate for EFL reading instruction with the integration of collaborative learning and the use of wiki.

4.2.2 Discussion on the Findings of the Efficiency of Wiki-based Collaborative Reading Lessons (WCR Lessons) in the Three-Step Tryouts and the Experiment

The results of the efficiency of WCR Lessons (E_1/E_2) obtained from the three-step tryouts and the experiment (trial-run) showed that the efficiency of WCR Lessons met the 80/80 criteria. This indicates that WCR Lessons proved to be effective in collaborative reading instruction. The details and reasons are explained below.

The WCR Lessons were created to be consistent with the WCR Instructional Model, which had been approved by experts as being appropriate for reading instruction for EFL university students, according to the principles of collaborative learning, and reading comprehension learning. The objectives of the lessons conformed to those of the course outline of English III. Also, the contents of WCR Lessons were designed to be parallel with those in the textbook. However, WCR Lessons were different from the normal reading classrooms and instructional tools in that they emphasized online collaborative learning, where students were encouraged to take part in interactions and discussions with their peers through the use of wiki. By means of interactions and

discussions on wiki, the students could share their opinions freely accompanied by the teacher's facilitation.

Prior to implementation of the main study, the WCR Lessons were tested in Three-step tryouts to determine the efficiency levels of the process (E_1) and the product (E_2) of learning on the basis of the 80/80 standard. The tryouts consisted of three stages: the individual testing, the small-group testing, and the field-testing. Each stage of the tryouts revealed some weak and strong points of the lessons. As a result, the lessons were revised and improved in accordance with the participants' opinions and comments. The results of each stage of the tryouts are explained below.

Regarding the results of the tryouts, E_1/E_2 levels of Individual Testing and the Small-group Testing did not meet the 80/80 Standard. In other words, the exercises and quizzes were not efficient. They were subsequently revised and improved. Finally, in the field testing, the efficiency of the lessons of all learning units were greater than the 80/80 Standard, indicating that all the exercises and quizzes of WCR Lessons were efficient. Similar to Field-study Testing, the level of E_1/E_2 of the lessons of the experiment satisfied the 80/80 Standard. Obviously, it can be seen that the efficiency of students' learning process or activities and quizzes (E_1) was higher than that of students' learning products or end-of-unit tests (E_2) across all stages of both the tryouts and the main study. 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). In her study, Suwanbenjakul (2002) 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 pointed out another reason was that the tests could be more difficult than the exercises, so students were likely to achieve lower scores than they did in the exercises. Similarly, 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 the discretion of the teacher, but they could do the tests only once.

On the other hand, the findings of the present study did not agree with some of similar research studies. Suppasetseree (2005), for example, developed a model called the SREO Plan, a model for web-based instruction for a remedial English course. The results showed that the students achieved higher scores in the product (E_2) than the process (E_1). He explained that this might be because the contents, formats, and level of difficulty of the tests and the exercises were similar. As a result, the students could perform better in the tests after repeated practice in the lessons and exercises. Likewise, the study by Saitakham (2010), who developed an instructional model for a web-based vocabulary instruction, demonstrated that students gained higher scores in the product than the process. In other words, they performed better in the tests than in the exercises. He assumed that students might have high motivation in gaining higher scores in the tests after mastering vocabulary skills to some extent through the exercises. Similarly, Winaitham (2012) created a model called SPMC Model to develop a courseware for improving students' English pronunciation. Her study revealed that the students had

better performance in the product than the process. The reason for this was that the students might gain knowledge from previous lessons, so they could perform better in the tests, and even better in later units.

In conclusion, the results of the efficiency of the process and the product (E_1/E_2) of Wiki-based Collaborative Reading Lessons (WCR Lessons) were proved to have satisfied the 80/80 Standard criteria. This demonstrated that the lessons, activities, and tests proved to be effective for EFL reading instruction through collaborative learning and the use of wiki, in spite of the differences in the findings of students' improvements in the efficiency of the process (E_1) and the product (E_2) with those of previous studies in a similar field.

4.2.3 Discussion of the Effects of the WCR Lessons on Students'

Achievements in Reading Comprehension

This section discusses the results of the effects of the WCR Lessons on students' reading comprehension achievements in two aspects: overall achievements and achievements classified by reading comprehension skills. The former aspect explains students' reading achievements as a whole, whereas the latter discusses more detailed information of students' reading achievements categorized by five different skills.

4.2.3.1 Discussion of Students' Overall Reading Comprehension

Achievements

The results presented in Table 4.7 and 4.8 reveal that the students achieved higher average scores ($p<.000$) in the posttest ($\bar{x}=12.16$) than the pretest ($\bar{x}=11.41$). This demonstrates that the Wiki-based Collaborative Reading Lessons had significant effects on students' reading comprehension. Accordingly, the gain in the post-test of the students in the main study can be explained by two main reasons.

First, WCR Lessons were more student-centered, as opposed to teacher-led in the traditional reading class. They placed more emphasis on collaborative learning which allowed the students to discuss and share their opinions more freely while carrying out challenging reading activities with considerably little transaction from the teacher. With the integration of wiki as a medium for the students to discuss online, collaboration and interaction became very simple. This promoted and motivated the students to take parts in the lessons, hence enhancing the students' performance in doing the exercises provided in WCR Lessons. Consequently they could also perform well in the end-of-unit tests and in the post-test. Furthermore, this perspective is supported by the results of the students' semi-structured interviews which reveal that collaborative reading helped them understand how to read English passages more effectively.

These phenomena were consistent with Fan (2010) who conducted a research on the effects of collaborative strategic reading (CSR) instruction on 110 Taiwanese students' reading comprehension. She found that her students' reading comprehension improved statistically in terms of identifying main ideas and finding supporting ideas in the reading passages. Part of the students' progress in these two reading cognitive skills was due to their collaboration in group work. In favor of this perspective, a study by Zoghi and team (2010) demonstrated that students were comfortable with and favorable to collaborative learning because in the traditional classroom, they were more controlled by the teacher in learning, but in a collaborative setting, they had more freedom and were motivated to express their ideas. Similarly, Wichadee (2010) discovered that the students who participated in a collaborative learning method called STAD demonstrated a statistical improvement in their reading comprehension skills.

A second reason is that, as indicated by the results of the questionnaire and the oral interview, most of the students paid more attention to vocabulary and sentence connectors to comprehend reading passages, besides having considerably superficial exposure to English reading instructions. This could also be interpreted to mean that reading classrooms at secondary school level placed a greater focus on a bottom-up approach, such as the knowledge of vocabulary and sentence connectors than a top-down approach, which requires more complex cognitive skills, such as identifying main ideas and finding the gist of the passage. As a result, the students tend to focus more on vocabulary rather than drawing the main ideas from paragraphs or the overall text (Nagao, 2002). In the WCR Lessons, however, the students were exposed to lessons and exercises that emphasized both bottom-up (topic preview, vocabulary, and using referents) and top-down (identifying topics and main ideas, and inferences) reading skills. Moreover, the students were allowed to practice these exercises repeatedly, so they eventually mastered these important reading skills to some extent. As a result, they could perform better in the posttest.

4.2.3.2 Discussion of Students' Reading Comprehension

Achievements Classified by Reading Comprehension Skills

The results illustrated in Table 4.10 show that the students performed significantly better in the posttest than in the pretest with respect to the three reading skills: identifying main ideas, finding supporting details, and making inferences   (p <.01). Nevertheless, the participants did not make significant differences in the posttest in the parts of vocabulary and using referents in comparison with the pretest. This could be interpreted to mean that the WCR Lessons helped the students improve their top-down reading skills, but did not significantly enhance their bottom-up reading skills.

Regarding the statistical improvement in students' ability to identify main ideas and 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 a lot of 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.

As earlier stated, the results of the study also revealed that there were no significant differences in the students' performance in the pre- and post-tests in terms of vocabulary and using referents. This could be because in the WCR Lessons the students were required to do 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 about 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 heavily influenced by individual differences. Students' individual differences refer to differences in age, attitude, intelligence, language proficiency level, and learning style.

In summary, through the WCR Lessons and the use of wiki, the students demonstrated a statistical improvement in their reading comprehension in the posttest. This finding confirmed that the WCR lessons were capable of promoting collaborative learning and students' top-down reading comprehension skills effectively.

4.2.4 Discussion of the Findings of Students' Interaction in Discussion Activities

The results presented in section 4.1.5 provide the answers to *Research Question 4, "How do students interact and collaborate among themselves in the accomplishment of leaning activities in Wiki-based Collaborative Reading lessons?"* By utilizing the interaction analysis model (IAM) proposed by Gunawardena et al (1997) for content analysis of students' online posts in completing their assigned group activities, a number of points of interest were revealed.

First, the key finding of the study reveals that the students were engaged in all the five interactive phases prescribed in the IAM. Most of the overall discussion was generated in Phase I (68%), which Gunarwadena and her team consider as representing lower cognitive functions. Nevertheless, it was evident that limited operations were performed in the following higher-cognitive phases, namely, Phases II, III, and V, respectively. Moreover, remarkably low discussion was conducted in Phase IV (3.2%). This finding suggests that the students tended to discuss at the lower levels of interactive engagements of Phase I. They started the activities by sharing their opinions or background knowledge about the topics to be studied. The data also showed that by

sharing opinions some minor disagreements may have occurred.So, the students tried to resolve these conflicts, as indicated by a small amount of engagements in Phase II (12.4%) and Phase III (8.3%), accordingly. This finding was consistent with previous similar studies. Schellens and Vackle (2005), for example, employed the IAM to analyze undergraduate's online posts and found that the proportion across all the five interactive phases was 52%, 14%, 33%, 1.2%, and 0.4%, respectively. Another study was carried out by Sing and Khine (2006) to examine the pattern of online participation among in-service teachers in Singapore. By an analysis using the IAM, they discovered that the participants conducted overall discussion across all the interactive phases at the proportion of 60%, 20%, 13%, 4%, and 3%, accordingly. Likewise, Choo, Kaur, Fook, and Yong (2013) conducted a study on the patterns of interaction of ESL Malaysian students during online collaboration in a reading for academic purposes class. On the basis of adapted IAM, of which its phases were collapsed to four, they found that the proportion among the interactive phases performed by the students was 71.15%, 16.40%, 7.67%, and 4.77%, respectively.

In the present study, considering the proportion of students' discussions across all the five interactive phase at 68%, 12.4%, 8.3%, 3.2%, and 8.1%, it can be seen that there was a considerable amount of student engagements in Phase V, the highest cognitive level of IAM. As prescribed in the IAM, Phase V involves making a summary of what the group has agreed or has shown in the form of newly constructed knowledge. This finding could be due to the conditions of WCR Lessons that requested the students to take turns in changing their specified roles. One important role was that of the reporter, for which the assigned student had to report the agreed ideas or answers of the group. As a consequence, a summary of the groups' agreed ideas were always

made, resulting in a prominent amount of discussion in Phase V in comparison with other previous studies. Moreover, as illustrated in Table 4.11, it is evident that the ranking from the most to least frequently engaged interactive phases generated by the students was Phase I, Phase II, Phase III, Phase V, and Phase IV, respectively, across all three stages of the reading process.

In addition to the consistent proportion of students' engagements in the five interactive phases, another interesting finding of the present study was the amount of students' discussion in regard to the Pre-, While-, and Post-reading stages. According to Table 4.11, the students generated a greater amount of discussion in the While-reading activities, which involved identifying the main ideas and supporting details of the reading passages, than in the other two reading stages. This could be due to the fact that comprehension of the main idea is a complex activity which involves various reading components and knowledge sources (Pressley, 1998; Grabe, 2009; Wilawan, 2011). Moreover, identifying the main ideas and distinguishing them from supporting details could be a challenging task for students. As a result, this while-reading activity could stimulate the students to brainstorm in order to solve the given problems. This eventually resulted in a great deal of discussion.

Another interesting finding of the present study was the proportion between the overall amount of students' discussion and the teacher's facilitation. As shown in Table 4.11, the amount of students' discussion and teacher's facilitation reveals a negative relationship. In other words, the number of student discussions had a tendency to increase as the students followed the learning units. The teacher's facilitation, on the other hand, showed a decrease as the students moved on to the next units. This could be interpreted to mean that the teacher's facilitation was necessary in the early stage of

learning, but in the long term, it tended to regress. This can be explained by the theory of the Zone of Proximal Development (ZPD) proposed by Vygotsky. The ZPD is based on the premise that a learner gradually develops his skills or abilities through interaction with more capable friends or with the teacher, who provides support or scaffolding. In the case of the WCR Lessons the students worked and discussed in groups with the occasional facilitation of the teacher. More support from the teacher was needed in the early stages as the students were newly exposed to the collaborative learning environment. When they began to form interpersonal relationships with their group members, their affective filter or anxiety started to reduce. Eventually, the students became more relaxed and open to interaction with their peers, which resulted in an increase in the amount of discussion.

4.2.5 Discussion of Students' Opinions and Satisfaction with the

Wiki-based Collaborative Reading Lessons (WCR Lessons)

This section presents a discussion of the findings of students' satisfaction with the WCR Lessons obtained from the questionnaire and semi-structured interview. The findings of both the questionnaire and the interview showed that the students had positive opinions and perceived the WCR Lessons as being satisfactory.

4.2.5.1 Discussion of the Findings of the Questionnaire

The questionnaire was divided into four sections: students' satisfaction with the WCR Lessons, students' satisfaction with the WCR website, students' perception of the effects of the WCR Lessons on their reading skills, and the open-ended responses.

First, the part concerning students' satisfaction with the WCR Lessons demonstrated that the students felt strongly that the WCR Lessons encouraged them to

express their opinions and feelings in English while they were having group discussions ($\bar{X}$ = 4.01, SD = 0.707). This could be because the students had less anxiety in expressing ideas and using the target language while going online by using a tool the CMC wiki, which provides a non-threatening environment and therefore lowers the affective filter for learning (Beauvois & Eledge, 1996; Kötter, 2001; Liu & Sadler, 2003; Coniam & Wong, 2004). Furthermore, WCR lessons provided real-world content and numerous activities such as identifying keywords and the main ideas of the given passages that encouraged the students to think logically and critically. Furthermore, the learning procedures were conducted in accordance with collaborative learning principles; as a result, the students strongly agreed that the activities in WCR Lessons promoted collaboration among teammates ($\bar{X}$ = 3.88, SD = 0.666). Another point about the WCR lessons was that the students perceived them as being most satisfactory because the lessons enabled group members to assess the progress of group work ($\bar{X}$ = 3.75, SD = 0.668). Since wikis are usually designed to be accessible to users who belong to the group, meaning that any member can have access to the group wiki, unless it is intended to provide limited access, in order to to post comments and check the progress and history of the group work.

The second section of the questionnaire, students' satisfaction with the WCR website, revealed that the students strongly agreed that they did not have difficulties in doing activities or exercises on the website ($\bar{X}$ =3.89, SD 0.535) or in posting comments and opinions ($\bar{X}$ =3.74, SD = 0.569). This was due to the fact that wikis offer a flexible user-friendly interface for collaboration, knowledge construction, and student interaction (Schwartz, Clark, Cossarin, & Rudolph, 2004). Web pages on the WCR website were designed to have a very simple interface with a minimum of

complex technicality, so that they did not look confusing to the students, which could

be daunting. Next, the students also strongly agreed that the structure of the WCR

Lessons was user-friendly ($\overline{X}$ =3.86, SD = 0.567), this was because the lessons and the

website had been tested in the Three-step tryouts prior to the main study. So they were

revised and improved several times in compliance with the comments of the tryout

participants to ensure that the prototype was appropriate in terms of contents and

appearance.

The next section of the questionnaire, students' perceptions of the effects

of WCR Lessons on their reading skills, suggested that the students strongly agreed that

overall the WCR Lessons helped improve their reading comprehension skills ($\overline{X}$ =

4.27, SD = 0.515). This perception was probably because the lessons provided the

students with the opportunity to practice the important reading skills, such as the use of

background knowledge, word tackling, identifying main ideas, and summarizing key

ideas, which are key strategies to reading comprehension (Mc Namara, 2007; Mustapha,

Mohammed Maasum, & Zoghi, 2010; Presley & Haris, 2006; Zoghi, 2006). As a result,

the students also strongly agreed that the lessons encouraged them to use various

reading strategies ($\overline{X}$ = 4.17, SD = 0.519). Throughout the Pre-, While-, and Post-

reading stages of each learning unit of the WCR Lessons, the students were required to

practice different exercises in order to practice the use of different reading strategies.

For example, in the pre-reading stage, the students were asked to share their ideas about

what they knew about the topic and their prediction of what the passage was going to be

about. Then, they were asked to do a vocabulary preview to let them learn important

words and phrases that could be helpful to them to understand the passage. Next, while

they were reading the passage, they were also required to identify key words and the

main idea of each paragraph. Finally, upon finishing reading the passage, the students were asked to share their ideas of what they had learned from the text and do an exercise to summarize the text. Furthermore, the students agreed that the lessons enhanced their motivation to read English passages ($\overline{X}$ = 4.09, SD = 0.527). This was presumably because the students, to some extent, had mastered the key reading strategies they had practiced in the WCR lessons, so they were able to use the strategies to assist their comprehension and overcome difficulties, which could cause anxiety, while reading English texts. With lowered anxiety, the students had a higher motivation to read.

The final part of the questionnaire, the open-ended responses, revealed three main findings: students' encouragement in using English in discussion activities, perceived improvement in reading comprehension skills, and increased positive attitudes towards doing group work. The first category of responses supports the findings presented in the first section of the questionnaire which is that through the use of CMC, in this case wiki, the students had a lowered affective filter, and therefore, they were more willing to use the target language with less anxiety. Next, the finding in regard to the students' perceived improvement in reading comprehension skills is consistent with the finding of the second section of the questionnaire that most students reported that the lessons helped them improve their reading comprehension skills. Finally, some students also reported having more positive attitudes towards doing group work. This was because students were assigned to play a particular role in the group, and take turns with the roles weekly, which is the main practice in collaborative learning. As a result, they were engaged to play their role actively. In addition, the teacher also monitored group performance quietly by observing their work online. This could ensure that there were no free-loaders in the students' groups.

4.2.5.2 Discussion of the Findings of the Semi-structured Interview

The semi-structured interview suggested that most of the students were not exposed to instruction on the use of reading strategies at the high school level. Despite having little exposure to reading strategy instruction, the students reported using only bottom-up strategies, such as guessing meaning from contexts and word formation in doing reading comprehension tests. So, they had great difficulty in answering questions that required higher cognitive skills, like making inferences and getting main ideas. Therefore, this became one of the major problems with their reading performance at university level, too. This could be a reason why the students viewed WCR Lessons as being very satisfactory in terms of improving their reading strategies, both in the use of bottom-up and top-down techniques.

In terms of collaborative group work, the students said that they changed their attitude to be in favor of doing group work. They stated that they had disliked doing group work originally because they experienced unfair work allocation among group members. However, in a collaborative learning setting as in the WCR Lessons, they felt it was fair for everybody in the group to have a more or less equal workload. Furthermore, through working on their group's wiki pages, the students felt they had more privacy because they had their own workspace; as a consequence, they could communicate or discuss in English with more confidence. This encouraged them to use English more than in a face-to-face situation in a traditional classroom. Another reason for more English language use was that the WCR Lessons allowed the students to have more control in doing the activities without the teacher's physical presence. Moreover, through collaborative group work and reading strategy practices, the students reported that they learned reading techniques from the lessons and from their teammates, which

were really helpful. From a more thorough perspective of this finding, it could be inferred that the students had a shared goal in carrying out the tasks in carrying out collaborative activities in WCR Lessons, so they tried to construct knowledge to answer the questions in the given tasks, in spite of the fact that more ideas came from the students with higher proficiency. Another remarkable point arising from the interview was that most of the students stated that the WCR Lessons positively changed the way they read English texts. Since the activities in the WCR Lessons offered opportunities for practicing important reading strategies in the pre-, while-, and post-reading stages, the students became aware of how to proceed in their reading of passages.

To summarize, the students viewed the WCR Lessons as being very satisfactory and effective in enhancing students' reading comprehension skills. The lessons provided the students with greater opportunities to discuss and express their opinions more openly with limited transaction from the teacher, who provided facilitation as necessary. In addition, the lessons offered opportunities to the students to practice important reading comprehension skills, which consequently raised the students' awareness of using those strategies to overcome difficulties while reading English passages.

4.3 Summary

This chapter has presented and discussed the findings on the development of a Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model), the efficiency of the Wiki-based Collaborative Reading Lessons (WCR Lessons), students' reading achievements, their interaction pattern while doing collaborative reading activities in the WCR Lessons, and their opinions about the lessons. In Chapter 5, WCR Instructional Model will be discussed in further detail.

CHAPTER 5

WIKI-BASED COLLABORATIVE READING

INSTRUCTIONAL MODEL: WCR

INSTRUCTIONAL MODEL

This chapter presents details and description of the construction, components, contents, and lessons in Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model). Then, some example web pages of Wiki-based Collaborative Reading Lessons (WCR Lessons) are illustrated.

5.1 Introduction

Instructional system design (ISD) has been involved in the developmental procedures of a wide variety of fields of instructions and training such as military, industry workers, and education since the 1940s. In spite of having numerous different definitions, holistically the terms instructional design is referred to as "an organized structure that embraces the steps of analyzing, designing, developing, implementing, and evaluating instruction." In Chapter 2, a number of instructional models, classified in three different types: product-oriented, classroom-oriented, and system oriented, such as ADDIE Model, Kemp Model, Dick and Carey Model, and SREO Model were intensively reviewed. Since no single model is useful and completely substitutable to one and other due to different contexts and purposes (Gustafson & Branch, 2002), these

four models were absolutely oriented to different individual goals and objectives. Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model) was no exception. The model was designed and constructed to have unique characteristics, specific objectives and goals, which differed from other instructional models reviewed above. Details and descriptions of WCR Instructional Model are presented the following sections.

5.2 Design of Wiki-based Collaborative Reading Instructional

Model (WCR Instructional Model)

As online instructional system design incorporated with collaborative learning approaches has gained superficial interest from practitioners and the effectiveness of collaborative learning models have been scarcely investigated (Zhan, 2008) despite the fact that their educational benefits have been widely acknowledged.

To address this issue, an instructional model that integrated both online instruction and collaborative learning approach called Wiki-based Collaborative Reading Instructional Model was developed. The model development started with rigorous reviews, analyses, and syntheses of well-known instructional models classified into three types: classroom-oriented, product-oriented, and system-oriented, that have played major roles in the field of education. WCR Instructional Model was basically an online system-oriented model with emphases on front-end analysis and learning products. The model was comprised of six main steps and sixteen sub-steps as illustrated in Figure 5.1.
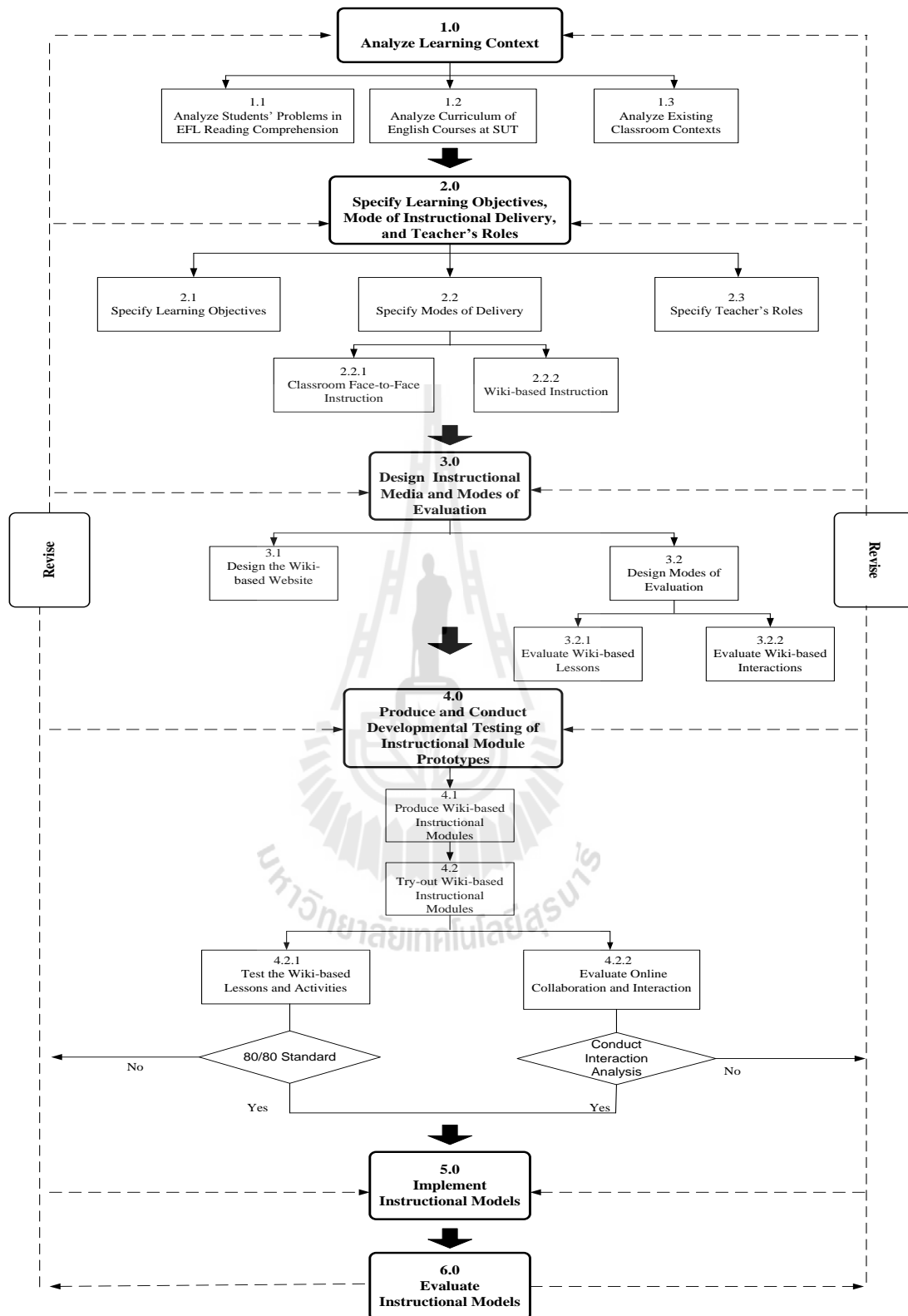
Figure 5.1 The Flowchart of Wiki-based Collaborative Reading Instructional

Model (WCR Instructional Model)

All the steps and sub-steps of the model are described as follows:

1.0 Analyze Learning Context

The first step of the model involved the analysis of learning context in which instruction took place. The terms learning context in this study covered three aspects, namely, students' problems in reading comprehension, and curriculum of English language instruction, and existing classroom settings at Suranaree University of Technology.

1.1 Analyze Students' Problems in English Reading Comprehension

In order to investigate what SUT undergraduate students have in EFL reading, a review of studies related to students' problems in English reading comprehension at SUT was conducted. The review showed that students' problems in reading include low vocabulary knowledge (Ward, 2000; Saitakham, 2010) and the lack of reading comprehension strategies (Wongla, 2000; Thanasoontornrerk, 2004). On the basis of the aforementioned studies, it was highly recommended that vocabulary knowledge and reading comprehension strategies be integrated in EFL reading instruction at SUT.

1.2 Analyze the Curriculum of English Courses at SUT

Another important element of the analysis step was the analysis of the curriculum where the instruction will be made. The analysis was performed in order to understand the requirements of prerequisite skills students need to have. In this study, the curriculum of English courses for the School of Foreign Languages at Suranaree University of Technology were thoroughly analyzed. The analysis revealed that English courses available at SUT places primary focuses on communication skills in parallel with the development of other language skills such as listening, reading,

and writing. Moreover, contents of the courses range from general English to English for science and technology.

The focus of this study, however, was placed on English III Course, which aims at improving students' reading skills, both basic and advanced levels. Due to the fact that the first two prerequisite English Courses: English I and English II, emphasize the improvement of students' communication skills, where reading skills were minimally involved, being put into a new course where different language skills were the focuses might be problematic to students. In addition, students of English III Course tend to have different levels of language proficiency, especially in terms of reading. As a consequence, getting the students to work together in collaborative groups, where members of mixed language abilities worked together with assistance of the teacher, could help them improve their English reading skills at the basic levels prior to moving further to English IV that deals with more advanced ones.

1.3 Analyze Existing Classroom Contexts

For all compulsory English courses available at SUT, the classrooms were divided into two sections, the tutorial section and the computer laboratory section. The tutorial section covered two periods of 50 minutes, whereas the laboratory section one period. The tutorial section takes place in a normal classroom equipped with a set of computer and audio visual aids, while the computer laboratory section is provided in order to allow students practice their language skills on computers, either as assigned by the teacher or their own interests. For English III course, students were arranged into groups of four and assigned to work collaboratively online on a wiki. Although the normal computer laboratory section lasted only 50 minutes, students could continue working on their group assignments outside classroom.

2.0 Specify Learning Objectives Mode of Instructional Delivery, and Teacher's Roles

The second step of the model concerns the specification of four main elements, namely, learning objectives, instructional modes of delivery, instructional media, and evaluation and testing of the instructional system.

2.1 Specify Learning Objectives

This step is set to specify learning objectives and outcomes in regards of collaborative learning. Learning objectives involves what the learners are supposed to know or will be able to do after taking each lesson, while learning outcomes are the performance of the learners after taking the lesson. In English III Course, the learning objectives are

(1) to enhance students' reading skills through text-based activities,

(2) to promote students' communicative skills, especially in the field of science and technology, and

(3) to engage students with exposure of authentic and semi-authentic materials, either printed or online.

2.2 Specify Modes of Instructional Delivery

In this step, instructional modes of delivery of English III Course were clarified. As earlier explained in 1.3, classes are divided into two sections: tutorial and computer laboratory. Therefore, two instructional modes of delivery are involved. Face-to-face instruction is a normal convention for the tutorial section, whereas CALL-based instruction and online instruction are common in the computer laboratory period.

In this model, however, the entire instruction and activities were performed online through a wiki website, which features the implementation of collaborative learning approach.

According to Johnson and Johnson (1989); and Johnson, Johnson, and Holubec (1998), there are five core elements of collaborative learning, namely, positive interdependence, promotive interaction, individual accountability, interpersonal and small – group skills, and group processing. In order that collaborative reading instruction be effective, it was highly suggested that both collaborative learning and reading comprehension strategies be taught explicitly taught, and it is necessary that students are assured to understand them.

2.3 Specify Teacher's Roles in Online Learning

In order to ensure that collaborative learning took place effectively, it is necessary that teacher's roles be specified. As described in 2.2 that English III was divided into two sections: tutorials and computer laboratory and collaborative learning will be engaged online via wiki in the lab section, teacher's roles, as a result, in this model will be designated to online setting.

Regarding a number of researchers in online collaborative learning (Palloff and Pratt, 2005; AcLoughlin, 2002; Wise et al., 2004), the roles of online instructors are classified into three types: cognitive supporter, technical supporter, and emotional supporter, respectively.

The teacher as a cognitive supporter clarifies questions and raise questions stimulate students' higher level thinking in order to initiate students' collaboration. Also, the teacher was sometimes required to assist students with technical support such as creating links within web pages, posting comments or messages, and managing group's files. In some occasions, the teacher needs to provide emotional support to show care and encouragement to the students. That is when students are engaged in collaboration

in doing group work, conflicts may happen. The teacher, then, may come in between to moderate the conflict and push the group back to harmony.

3.0 Design Instructional Media and Modes of Evaluation

Pertaining to the learning objectives and outcomes specified in Stage 2.1, instructional media, which facilitated online collaborative reading instruction and modes of evaluation of students' performance were designed in this stage.

3.1 Design the Wiki-based Website

A considerable number of research studies in language instruction (e.g. Chang, 2009; Chen, 2008; Wang et al, 2005; Martinez-Carrillo and Pentikousis, 2008) state that evidentially wikis are one of the most renounced and promising Web 2.0 applications that effectively promote collaborative learning, which has been recognized by online educators as one of the most promising pedagogical approaches for distance learning (Bernard, Rubalcava, and St-Peirre, 2000). Furthermore, wikis have also been proved to be an effective tool for improvement of language skills, including reading. In WCR Instructional Model, a wiki website called "*PBworks*" was employed as the online platform for students' collaboration and interaction on the assigned reading exercises and lessons.

On the PBworks web pages, some other facilitating online media such as digital document files, reading passages, and audio and video media were also available.

3.2 Design Modes of Evaluation

This step intends to design and perform evaluation of both students' online group collaboration and interaction, and students' reading comprehension abilities. In terms of the evaluation of students' collaboration and interaction, it is always a

challenging and important task since it informed the instructor and the students if learning objectives have been achieved. Group exercises and assignments were designed to encourage students' collaboration. For students' online interaction, a model for this analysis is called the Interaction Analysis Model (IAM) proposed by Gunawardena et al (1997).

Concerning the students' reading comprehension achievements, a parallel pre-test and post-test were constructed in the form of multiple choices, each containing 40 questions with four alternatives. Then, the tests were content-validated by experts, and administered to the samples later.

4.0 Produce and Conduct Developmental Testing of WCR Lessons Prototype

Once all processes in Step 3.0 were completed, then a prototype of online instructional lessons was produced and evaluated for its validity and efficiency. This stage was divided into two steps: Produce the wiki-based collaborative lessons prototypes and Try-out the prototypes.

4.1 Produce the Wiki-based Collaborative Reading Lessons (WCR Lessons)

This step deals with the production of lessons and activities for wiki-based collaborative reading instruction. The production process of the prototype was comprised of seven steps described below.

First, the course description of English III and course instructional materials and textbook were studied. Then, a review of related literature about collaborative learning and reading instruction was carried out. Next, a study on the application of wikis and their technical details was studied. The next step involved the design of lessons and activities that support collaborative learning on wiki. After that, a

prototype of the instructional lessons, that is a wiki-based website for the lessons and activities were later constructed. Then, the prototype was evaluated by a panel of three experts for its content validity. Finally, the prototype was revised in accordance with comments and opinions of the experts.

4.2 Conduct Developmental Testing of the Prototype of Wiki-based Collaborative Reading Lessons (WCR Lessons)

Once the design of the prototype was accomplished, the prototype was trialed in order to evaluate both the efficiency of the lessons and the approach of students' online interaction and collaboration.

4.2.1 WCR Lessons Tryout

In this step, the prototype underwent a three-step tryout consisting the individual testing, small group testing, and field study testing, respectively. The small groups-testing was conducted to a group of four students with three different language proficiency classified as low, intermediate, and high, respectively. The group, therefore, consisted of one low, two moderate, and one high proficiency students. The four students were required to participate in an orientation for the use of wiki and collaborative learning, then, they were asked to do online lessons and exercises on wiki. While taking the online course, the students were requested to take formative quizzes, then, at the end of the tryout they were asked to take the end-of-unit test. The students' scores in the quizzes and test were evaluated using the criterion called the 80/80 Standard proposed by Brahmawong (1978). 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.

Apart from this evaluation, the students will also be requested to give comments on the lessons and the use of wiki for further improvement of the instruction.

Similarly, the other two tryouts: the small group testing and the field group testing followed the same procedure as that of the individual testing; however, what is different is the number of participants. The small-group testing required six participants whereas the field testing needed forty-four participants.

The prototype was considered valid and qualified once the Field-testing step, the last step of the Three-Step Tryout meets the 80/80 standard; if not, revision of either the lessons or exercises had to be made and re-evaluated.

4.2.2 Students' Online Interaction and Collaboration Tryout

Parallel with the lessons tryout, students' online interaction and collaboration on the wiki were also be tested and evaluated. Based on a review of research studies in the field of online collaborative learning, it was highly recommended that the analysis of students' online interactions be performed using Interaction Analysis Model proposed by Gunawardena et al (1997), and approach of contribution be analyzed using frequency counts of students' posts and content analysis. Regarding the analysis of students' online interaction, first, an IAM scoring rubric was created by the researcher. Then, the rubric was evaluated by experts, and was subsequently revised. After that, two raters were required to perform the analysis. They were explained about the IAM, and how to get the data of students' interaction and collaboration from the wiki's tracking system.

5.0 Implement WCR Lessons

Once the prototype was produced and tested, it was improved to become a qualified set of lessons to be implemented. WCR Lessons were later utilized with a

group of 95 students enrolled in English III Course at SUT in the 10-week experiment in Trimester 3/2013.

6.0 Evaluate the Lessons and System

After WCR Lessons were implemented, it was essential to evaluate learning processes and outcomes in order to determine whether the students could achieve the instructional goals, which was one of the significances of the model. To do so, both formative and summative evaluations were performed.

On the one hand, the formative evaluation was administered while the process of instruction was taking place. This evaluation could be achieved during the trial process by asking students opinions about the look, interactivity, and their satisfaction with the wiki-based website.

On the other hand, the summative evaluation was performed at the end of the instruction. It helped the instructor focus on students' performance in order to determine the extent of achievements students obtained through the wiki-based collaborative reading instruction.

After an evaluation of the model, either summative or formative, had been conducted, the process of revision was activated so that alterations may be made throughout the system. This means that any particular element of the system could be adapted or modified as the instructor considered appropriate.

In summary, the Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model) was designed under the principles instructional design. Its primary goal is to assist EFL university students to improve their reading comprehension skills through online collaborative learning environment, which is considered one of the most effective instructional approaches in EFL instruction. Also,

the model also engaged students to online learning environment using a web application called "wiki," which serves as a learning platform where students were assigned to interact and discuss in order to complete their online assignments.

5.3 Implementation of Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model)

For an educational institute which is enthusiastic in implementing WCR Instructional Model effectively, it is highly recommended that the following factors be taken into consideration.

5.3.1 Management Commitments in Technological Infrastructure

The first factor that plays an important role in effective use or adoption of WCR Instructional Model deals with management commitments in technological infrastructure. To employ the model effectively, it is imperative that the institute is fully committed to the preparation of basic technological infrastructure such as sufficient amount of high-quality computers and stable internet connection. As the model places an emphasis on utilization of online resources such as wiki and other websites to promote online reading instruction, it is vital to have the computers and access to the Internet.

5.3.2 Management Commitments in Personnel

Another factor concerns the development of personnel in charge. The institute should recruit experienced personnel in the field of online learning and academic contents such as reading instruction and collaborative learning. Moreover, in-house training and workshop on instructional system design and collaborative learning should be occasionally provided to develop both technical personnel and instructional

designers to be capable of dealing with the needs of WCR Instructional Model for course planning, production, delivery, and evaluation.

5.3.3 Personnel Commitments

While the commitments of the management are essential, those of personnel are even more important. The management provides the driving forces, but personnel members are driving gears to move the whole system forward. When the personnel (instructional system designers and instructors) are totally committed, meaning that they hold a strong belief that WCR Instructional Model and online collaborative instruction are effective and worthwhile, the lack or inadequacy of resources will not pose any barriers or obstacle to the success.

5.4 Wiki-based Collaborative Reading Lessons (WCR Lessons)

WCR Lessons contained lessons with similar contents to those in Read This! 2 Course book. After the lessons were designed, they were uploaded to a wiki website called "PBworks," which is a free websites developed on a wiki platform. The URL of WCR lessons is http://englishdotdotdot.pbworks.com/w/page/52984516/. PBworks is a wiki-based website that users can simply create a wiki workspace, which can be public or private (only viewable by those who have been invited to join the website). An outstanding feature of PBworks is that each webpage has a discussion box at the bottom of the page. Users can post questions in the box and other members of the group can post replies or comments. This makes online discussion very simple.

The objectives of WCR Lessons were to improve English reading comprehension skills of undergraduate students at Suranaree University of

Technology. The lessons consisted of three topics parallel with those of the textbook, Read This 2, which was employed in normal classroom. The topics were as follows:

Topic 1: Health and Nutrition

Topic 2: Animal Studies

Topic 3: Food and Nutrition

Each unit of WCR Lessons consisted of 3 main sections: pre-reading, while-reading, and post-reading sections, respectively. Each part contained a group discussion section, where the students are 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.

5.4.1 Pre-reading

The first section was divided into two sub-sections: topic preview and vocabulary preview. Topic preview aims to activate students' background knowledge about the topic, and to encourage them to predict what they are going to read. The pre-reading part starts with a number of questions related to the topic to let the students discuss with their teammates. The second sub-section, the vocabulary preview, was intended to provide a list of important words or phrases that could assist the students to comprehend the text. The vocabulary preview consisted of two activities: vocabulary study and vocabulary exercise. Vocabulary study is done through a commercial website "Quizlet," in which vocabulary activities and game modes are offered. The vocabulary exercise aims to ensure that the students gain the knowledge of the provided vocabulary

to some extent. This exercise was carried out on a website called "Quia," a well-known website for designing online quizzes.

5.4.2 While-reading

The objectives of this section were to encourage the students to use reading strategies to deal with unknown vocabulary while reading and to practice them how to identify key words and main ideas in the text. Regarding word-tackling techniques, some important strategies such as guessing meanings from affixes, roots, connectives, or from contexts were explicitly taught in their tutorial class. So, when the students did the activity online in group, the student who had been assigned the role of click-and-clunk master had to remind the team of the word-tackling strategies. In terms of identifying main ideas, the students worked in group and discussed among themselves which words or phrases are the key words of each paragraph, then the students were requested to do the exercise on identifying main ideas individually. To prevent the students from copying each other's answers, the exercises are timed and designated for specific time of access.

5.4.3 Post-reading

The post-reading part aimed to ensure that the students understand key ideas of what they have read. A number of follow-up questions are provided to check what the students have learned from the text. Moreover, the questions encourage the students to give feedback to reflect their ideas about the text and link them to the real-world settings. Furthermore, as a summary of the text and as a vocabulary practice, a fill-in-the-blank exercise was also provided at the end of the unit.

5.5 Overview of Wiki-based Collaborative Reading Lessons

This section presents overview information of the website of WCR Lessons. The URL of the website is http://englishdotdotdot.pbworks.com/w/page/52984516/ FrontPage. WCR Lessons included log-in information, topics, access to files and documents, and discussion box. Examples of web pages of WCR Lessons are presented as follows:

1) By entering the URL of the website provided above, the home page of WCR Lessons is shown. The teacher and students can go to "Sign up" to register to the system. The subscriber is required to enter his/her e-mail address and password. Notification of the subscription will be directed to the subscriber's given e-mail.

2) This is the homepage of WCR Lessons. The students can choose the topic or activities they are assigned to do in the content section.

Contents

Select the unit you want to learn as shown below:

▶▶ **Unit 1: Health Care**

Snoring

Is snoring just only a series of annoying sounds one makes during he/she is sleeping or is it a warning sign of a health problem?

Content Areas:
▶ Health Care
▶ Science

▶▶ **Unit 2: Animal Study**

Second Most Intelligent Mammal

Some apes look funny, some are huge while some are not. However, most of these creatures are said to be one of the closest species to humans.

Content Areas:
▶ Animal Studies
▶ Biology

▶▶ **Unit 3: Food and Nutrition**
Living to Eat or Eating to Live?
Some people may like fast food and convenience food, but some may not. They think fast food and convenience food are not healthful. Is that true?

3) This is an example of WCR Lessons in topic 3 "Food and Nutrition". The students are explained what they are going to do in this unit. In the picture is the topic preview page, and students are required to share their opinions too.
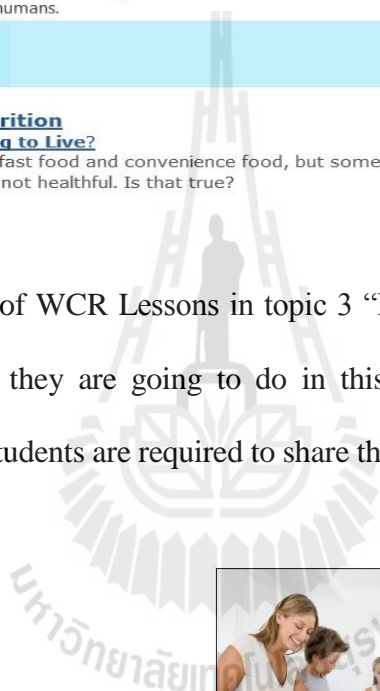
1. From the pictures above, where are the people in each picture and what are they doing?

2. How are the foods in each picture similar? How are they different?

3. From the pictures, which kind of food do you like most: cooking at home, eating convenience foods, or eating in fast food restaurants? Why? Please explain.

Then, click "next" to go the next page.

<< back   next >>

4) The students can choose to discuss with their groups in the assigned discussion task by going to their group web page, where they have their own workspace to share their comments and opinions.

5) There is a comment box at the bottom of every web page. The students can post their comments or opinions in this box. Their comments or posts will then appear in the page with the information of date and time the posts were made. Other students can read the posts and reply to any posts they want to.

6) Vocabulary Practice page is available for the students to practice the vocabulary related to the reading passage. The vocabulary exercises were designed on the website called "Quizlet" (www.quizlet.com). The students can practice both the definitions of the words provided and their pronunciation.

7) "Vocabulary quiz" is provided to evaluate students' vocabulary achievements. The

quizzes are designed on the website called "Quia" (www.quia.com).

Vocabulary (Eating to Live or Living to Eat?)

Choose the most correct alternative for each blank that follows.

1. This restaurant _____ vegetarian food. [▾] (1 point)

2. Good _____ is very important for children, and will make them healthy. [▾] (1 point)

3. A healthy diet should have all necessary vitamins and _____. [▾] (1 point)

4. Fish sauce is an important _____ for most of Thai food. [▾] (1 point)

5. I am overweight now. I think I should _____ seriously. [▾] (1 point)

6. I want to cook something new, so I baught this _____. [▾] (1 point)

7. _____, it takes around 20 minutes to go to town by bus. [▾] (1 point)

8. English is a/an _____ language, because people all over the world use it to communicate. [▾]
(1 point)

9. Fatty snacks and sodas are not healthy _____. You should avoid them. (1 point)
   - ○ nutrition
   - ○ minerals
   - ○ ingredient
   - ○ nourishment

8) The "Reading Passage" Page is created for the students to work in their group by sharing their ideas to discuss the assigned reading activities such as identifying key words and the main ideas.

[1]Most words in the English language have more than one simple, or basic, meaning. One example is the word diet. The most general definition of the noun is "a person's or group's usual food choices and habits." In a more specific definition, diet means "an eating plan with only certain kinds or amounts of food." For instance, a diet is often a plan to lose weight. Moreover, as a verb, diet means "go on diet."

[2]All over the world, the global diet includes fast food—prepared items from inexpensive restaurants, snack bars, or food stands. Some examples of typically American fast food are hamburgers, hot dogs, sandwiches, fried chicken, and so on. Some types of international fast foods might be German sausage and schnitzel, Italian pizza and pasta, Mexican tacos and burritos, Japanese sushi and tempura, Chinese eggrolls and noodles, and the like. The variety of fast foods available on the planet is growing. Even so, this kind of style of nourishment is becoming universal, or worldwide. Fast-food places usually prepare and serve the items quickly. Many are part of fast-food

[4]Some people believe food should be perfectly fresh and natural. They view that fast food is not good for human beings. They don't think that convenience foods such as canned, frozen, or packaged foods are nutritious either. In fact, these quick and easy kinds of foods are getting better and more healthful, however. Many fast food restaurants, for example, now have salad bars and put more vegetables items in their menus. In some places, veggieburgers are offered instead of hamburgers, and grilled chicken in place of fried. Also, some kinds of packaged fast-foods contain less fat, salt, and sugar. Moreover, some kinds of snacks like nutrition bars—snacks that contain a lot of protein, vitamins and minerals—are becoming widely available.

[5]Currently more people become more selective in eating, both at home or fast-food places. In general, more meals include the basic necessary food elements—protein, carbohydrates, and fats. The variety of food choices is large and increasing. The number of food preparation methods is growing too. Ways of cooking, eating habits, and food preferences all over the world are becoming more healthful. The global diet is changing in these and other ways.

9) The "Reading Comprehension Quiz" Page is designed for the students to evaluate their reading comprehension skills. All the quizzes provided in WCR Lessons can be done only once.

Identifying main ideas and supporting ideas (Living to Eat of Eating to Live?)

Identify the sentences in the following items whether they are main ideas or supporting ideas. Choose the alternative "A" for the main idia or "B" for the supporting idea

1. Paragraph 1

Most words in the English language have more than one simple, or basic, meaning. One example is the word diet. The most general definition of the noun is "a person's or group's usual food choices and habits." In a more specific definition, diet means "an eating plan with only certain kinds or amounts of food." For instance, a diet is often a plan to lose weight. Moreover, as a verb, diet means "go on diet."

What is the main idea and supporting ideas of Paragraph 1?

(1 point)

☑	The word "diet" can have different meanings.	a. main idea
☑	In some other specific sense, "diet" also means "to lose weight."	b. supporting idea
☑	In general, the word "diet" means "a person's regular food choice."	

2. Paragraph 2

All over the world, the global diet includes fast food—prepared items from inexpensive restaurants, snack bars, or food stands. Some examples of typically American fast food are hamburgers, hot dogs, sandwiches, fried chicken, and so on. Some types of international fast foods might be German sausage and schnitzel, Italian pizza and pasta, Mexican tacos and burritos, Japanese sushi and tempura, Chinese eggrolls and noodles, and the like. The variety of fast foods available on the planet is growing. Even so, this kind of style of nourishment is becoming universal, or worldwide. Fast-food places usually prepare and serve the items quickly. Many are part of fast-food chains (eating places with the same name and company owner). KFC, the Pizza Company, and Pizza Hut are some examples. Restaurants under a fast-food chain usually have a similar atmosphere—the look of the place, menus, and the style and taste of food, for instance.

What is the main idea and supporting ideas of Paragraph 2? (1 point)

☑	Fast food is prepared items from inexpensive restaurants or food stands.	a. main idea
☑	Some of convenience foods are parts of fast food chains.	b. supporting idea
☑	Fast food has the same look and similar atmosphere around the world.	

3. Paragraph 3

For several reasons, many people choose fast food. First, it is quick and convenient. Second, it is cheaper than special home-cooked meals or formal restaurant dinners. Finally, it is identical in every eating place with the same company name. The atmosphere and style of most fast-food places is casual, comfortable, and familiar. So why do other eaters dislike or stay away from this fast, easy kind of nourishment? The main reason is its low nutritional value. Fast food doesn't contain large amounts of fibers, vitamins, minerals, and the like—elements necessary for good nutrition and health. In contrast, most types of fast food have a lot of fat, cholesterol, sugar, and salt in them. Possibly, these substances can cause or increase health disorders, like heart disease, strokes, and some kinds of cancer.

What is the main idea and supporting ideas of Paragraph 3? (1 point)

☑	The atmosphere and style of most fast food places is informal and convenient..	a. main idea
☑	Reasons why some people choose or avoid fast food.	b. supporting idea
☑	Fast food products are not healthful and nutritionous.	

5.6 Summary

This chapter has presented procedures in constructing and developing WCR Instructional Model and the lessons. The model consisted of 6 main steps and 16 sub-steps. Details of each step and sub-step of the model have been profoundly explained. Furthermore, details of the lessons and example pages of the website were also presented.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

This chapter summarizes the findings and discussions presented in Chapters 4 and 5. Moreover, pedagogical implication and recommendations from Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model) and Wiki-based Collaborative Reading Lessons (WCR Lessons) as well as limitations of the present study will also be discussed. In closing the chapter, suggestions for further research will be presented.

6.1 Summary of the Main Findings

The present study was divided into two phases: the developmental phase and the experimental phase. 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.

In the developmental phrase, the researcher conducted a rigorous review, analyses, and syntheses of all the three types of instructional models: classroom-oriented, product-oriented, and system-oriented types. Those models included ADDIE Model, Kemp Model, Seels and Glasgow Model, Dick and Carey Model, SREO Plan, and Saitakham Model. Then, Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model) was consequently developed, and an evaluation form of

the model was created. Next, the evaluation form together with the instructional model was submitted to the three experts for evaluation and comments. After that, the model was revised in accordance with the experts' comments. Finally, WCR Lessons were designed on the basis of the approved model.

WCR Lessons were then tested in the Three-Step Tryouts: Individual Testing, Small-group Testing, and Field-study Testing, on the basis of the 80/80 Standard to examine whether WCR Lessons were efficient in terms of the process and product (E_1/E_2) of learning. In the first two steps of the tryouts, the results of E_1/E_2 showed that the efficiency of the lessons did not meet the 80/80 standard. As a result, the lessons were later revised and improved in compliance with students' comments and interviews, and were tested again in the field-testing stage. The results in the last stage of the try-outs indicated that the efficiency of the lessons met the 80/80 Standard, signifying that they were proved to be valid and effective in spite of some minor alterations, and were ready to be implemented in the experimental phrase.

Parallel with the Three-Step Tryouts was the pilot of the pre- and post-tests and the questionnaire. The tests were piloted to 120 English III students, a different group of participants from the Three-Step Tryouts. The results showed that the reliability of both tests was statistically acceptable with appropriate level of difficulty and power of discrimination. Furthermore, the questionnaire was tried out to 30 English III students. The result showed that the questionnaire had good reliability.

In the experimental phase, 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

pre-tested for their English reading comprehension abilities. After the 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. Moreover, a questionnaire and a semi-structured interview were carried out to obtain information of students' perceptions and satisfactions in WCR Lessons.

On the basis of the findings and discussions, the conclusions in this study can be summarized as follows:

Firstly, Wiki-based Collaborative Reading Instructional Model (WCR Instructional Model) was developed to contain 6 main steps and 16 sub-steps. All the 6 main steps include: 1) Analyze Learning Context; 2) Specify Learning Objectives Mode of Instructional Delivery, and Teacher's Roles; 3) Design Instructional Media and Modes of Evaluation; 4) Design Instructional Media and Modes of Evaluation; 5) Implement the Instructional Model; and 6) Evaluate the Instructional Model. All of the elements of the model were carefully designed so that they could be implemented effectively for EFL comprehension reading instruction. As a result, WCR Instructional Model was approved by the experts as being appropriate and satisfactory with the overall mean score of 4.73 out of 5.

Secondly, the efficiency of WCR Lessons (E_1/E_2) in the main study was 81.63/81.47, 81.75/81.38, and 80.67/80.23, respectively, which met the 80/80 Standard, indicating that the lessons were proved to be effective and met the learning objectives. Therefore, they were proved to be appropriate for English comprehension reading instruction.

The third findings involved students' achievements in reading comprehension abilities. The results suggested that overall the students gained significant higher

scores in the post-test than the pre-test ($p < .01$). Nevertheless, considering separate reading comprehension skills, it was found that the students significantly outperformed only in the top-down reading skills such as getting the main ideas, supporting details, and making inferences. In terms of the bottom-up skills such as vocabulary knowledge and using 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.

Through group interaction and discussion, the students assisted each other in negotiating and discovering meaning of the reading texts, especially in the tasks that require higher order cognitive skills such as identifying the main ideas and supporting details of the paragraphs. However, in terms of lexical level, the students did not demonstrate significant improvement after the intervention. This might be due to two reasons. First, vocabulary learning is a long-term process. In the main study, the students were given less than an hour per week in the computer laboratory to carry out all the exercises in a given unit. They had approximately ten minutes for practicing vocabulary, which was considered too short for them to understand new words. Another reason could be due to the fact that vocabulary is more of being individual-inclined than group-inclined learning (Lin, Hsiao, Tseng, and Chan, 2014). In other words, individual language proficiency accounts for the acquisition of new words. How well each student can understand and retain new words depends on their individual level of proficiency.

The findings with regard to students' interaction in discussion activities suggested that the students generated the greatest amount of discussion at the very

basic level of knowledge construction, that involves sharing and comparing ideas of other members in the group. On the other hand, the proportion of discussion extent in the higher level of knowledge construction was comparatively low. In terms of teacher's online facilitation, the results suggested that the degree of teacher's intervention during students' online discussion tended to reduce as the students' amount of interaction increased.

Finally, the findings of the questionnaire and semi-structured interview demonstrated students' positive perceptions and prominent extent of satisfaction with WCR lessons. They found collaborative learning challenging and motivating, and they liked taking parts in discussion with the groups. They also reported that they were delighted to contribute themselves to the groups in carry out group activities.

6.2 Pedagogical Implications

The findings of this present study suggest several pedagogical implications for English reading comprehension instruction in Thai university context. First, in designing an online instructional model for collaborative learning, the designer should look carefully into specific instructional problems of the institute by researching recent reports or published articles addressing existing learning difficulties. Then, solutions to the problems are decided, and effective instructional interventions can be designed. Doing so will be useful for the designer to designate clear objectives of the instructional model to be developed. Another point to consider is whether the selected instructional platform is compatible with the instructional design. Taking the present study as an example, a wiki was used as the main platform in the study because it

provides full supports and assistance to collaborative learning, and can fulfill the objectives of the study as well.

Second, it should be taken into careful consideration that the design of learning activities for collaborative learning should be content driven, not technology driven. Forman (1994) asserts that simply integrating the use of technology into the course does not improve the students' learning outcomes by itself, but the contents and pedagogical methods do. Since effective collaboration of the students may not automatically take place without clear procedures, it is very crucial that the instructor explicitly provide clear guidelines for group formation, role rotations, and evaluation of both the process and product (Murphy, 2004). Moreover, since collaborative learning is a student-centered pedagogical approach, the teacher himself should also encourage the students to be more autonomous. In so doing, the teacher should change his role to be a facilitator, observer, and active participant (Maloch, 2002; Yang, 1998) while the students are held responsible for their study including group participation and interaction. However, this does not mean that all the responsibilities are pushed on the students' shoulders. The teacher, as a facilitator, should be prepared to provide assistance and facilitation in case the students encounter a difficulty that hinders group collaboration. Therefore, teacher's implicit monitoring during online collaboration tasks is also highly advisable.

Third, in teaching reading comprehension skills, it is necessary that both bottom-up and top-down strategies be taught and formative, and summative evaluations for the use of both types of strategies be conducted to examine how well the students can master those skills. As suggested by the findings that the students did not make significant progress in the posttest in terms of vocabulary and referents

possibly as a result of time restriction during the intervention period. Moreover, the interview also showed that some of the students suggested that more vocabulary exercises should be added in the lessons. Therefore, extensive exercises and more time should be allowed for the practice of bottom-up strategies, vocabulary in particular. The students should be encouraged to do out-of-class online practice in order to improve their lexical skills.

6.3 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.

Thirdly, some groups demonstrated comparatively low interactions and amount of posts due to low interpersonal relationship. Since most of the students were majoring in management technology, and had been studying together for at least one year, they already had interpersonal relationship to each other to some extent. However, some groups inevitably contained members who were totally new to each other. So, they had to spend a longer time to build up interpersonal relationship among themselves than other groups.

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.

6.4 Suggestions for Further Research

Regarding the limitations mentioned in 6.3, 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 instruction 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, especially to promote EFL reading skills.

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 for future research studies

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.

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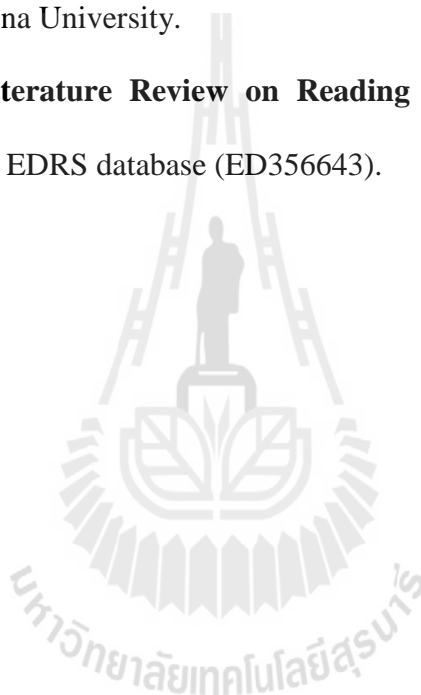
APPENDICES

APPENDIX A

Evaluation of the Efficiency of Wiki-based Collaborative

Reading (WCR) Lessons

1. Results of the Individual Testing

Note: E1 = Efficiency of the process in percentage

Unit	Student	Exercise (30 pts.)				Self Test (10 pts.)		E1	E2
		Ex. 1	Ex. 2	Ex. 3	$\bar{X}$	Test	$\bar{F}$		
1	1	8	8	7	7.91	7	7.75	79.17	77.50
	2	8	8	7		7			
	3	7	8	8		8			
	4	9	9	8		9			
2	1	7	7	8	7.58	7	7.25	75.83	72.50
	2	8	8	7		7			
	3	7	7	8		7			
	4	8	8	8		8			
3	1	7	8	8	7.67	8	7.50	76.67	75.00
	2	7	7	7		7			
	3	8	7	8		7			
	4	9	8	8		8			

E2 = Efficiency of the product in percentage

$\bar{X}$ = Average score all students obtained from exercises

$\bar{F}$ = Average score all students obtained from the tests

2. Results of the Small-group Testing

Unit	Student	Exercise (30 points)				Self Test (10 pts.)		E1	E2
		Ex. 1	Ex. 2	Ex. 3	$\bar{X}$	Test	$\bar{F}$		
1	1	8	8	8	8.83	8	7.90	80.83	79.05
	2	8	8	9		9			
	3	9	8	8		8			
	4	8	8	7		8			
	5	9	8	8		9			
	6	8	8	9		9			
	7	8	8	8		8			
	8	8	8	8		8			
	9	8	8	8		8			
	10	9	8	8		8			
	11	8	8	7		8			
	12	8	8	8		8			
	13	7	8	8		8			
	14	8	9	8		8			
	15	8	8	8		8			
	16	9	8	8		8			
2	1	8	8	7	8.00	8	7.81	80.00	78.13
	2	8	8	8		7			
	3	8	8	8		8			
	4	7	8	8		8			
	5	8	9	9		9			
	6	8	8	7		8			
	7	8	8	8		8			
	8	8	8	8		7			
	9	7	8	9		7			
	10	8	8	8		8			
	11	8	9	8		8			
	12	9	9	8		8			
	13	8	7	8		7			
	14	8	8	8		8			
	15	8	8	8		8			
	16	7	8	8		8			

2. Results of the Small Group Testing (Continued)

Unit	Student	Exercise (30 pts.)				Self Test (10 pts.)		E_1	E_2
		Ex. 1	Ex. 2	Ex. 3	$\bar{X}$	Test	$\bar{F}$		
3	1	8	8	7	7.91	8	7.72	79.17	77.25
	2	8	8	8		8			
	3	8	8	7		7			
	4	9	8	8		8			
	5	8	8	8		7			
	6	9	8	8		8			
	7	8	7	8		8			
	8	8	8	7		8			
	9	8	8	7		8			
	10	8	8	9		8			
	11	7	8	8		7			
	12	8	9	8		8			
	13	8	8	7		8			
	14	8	8	8		8			
	15	7	8	8		7			
	16	8	8	8		8			

3. Results of the Field-study Testing

Unit	Student	Exercise (30 pts.)				Self Test (10 pts.)		E₁	E₂
		Ex. 1	Ex. 2	Ex. 3	$\bar{X}$	Test	$\bar{F}$		
1	1	9	8	8	**8.17**	8	**8.14**	**81.74**	**81.40**
	2	8	8	8		8			
	3	9	8	7		8			
	4	9	8	8		8			
	5	9	8	8		8			
	6	8	8	8		8			
	7	8	8	8		8			
	8	8	8	8		8			
	9	8	8	8		8			
	10	9	8	8		9			
	11	8	8	8		8			
	12	8	8	8		8			
	13	9	8	8		8			
	14	9	8	8		8			
	15	9	8	7		8			
	16	9	9	8		9			
	17	8	8	8		8			
	18	9	9	8		9			
	19	8	8	8		8			
	20	9	9	8		9			
	21	9	8	8		8			
	22	9	8	9		9			
	23	8	8	8		8			
	24	8	8	9		8			
	25	8	8	8		8			
	26	9	8	8		8			
	27	9	8	8		8			
	28	9	8	8		8			
	29	8	8	8		8			
	30	9	8	8		8			
	31	8	8	8		8			
	32	9	8	8		8			
	33	8	9	8		9			
	34	9	8	8		8			
	35	9	8	8		8			
	36	8	8	8		8			

3. Results for the Field-study Testing (Continued)

Unit	Student	Exercise (30 pts.)				Self Test		E_1	E_2
		Ex. 1	Ex. 2	Ex. 3	$\bar{X}$	Test	$\bar{F}$		
1	37	9	8	8	8.17	8	8.14	81.74	81.40
	38	9	8	7		8			
	39	9	9	8		8			
	40	8	8	7		8			
	41	9	8	8		8			
	42	8	8	8		8			
	43	8	8	8		8			
	44	8	8	8		8			
2	1	9	8	8	8.16	8	8.12	81.60	81.23
	2	9	8	8		8			
	3	8	8	9		8			
	4	8	8	7		8			
	5	8	8	8		8			
	6	8	8	7		8			
	7	8	8	8		8			
	8	8	7	8		8			
	9	9	8	8		8			
	10	9	8	8		8			
	11	7	8	8		8			
	12	8	8	7		8			
	13	9	8	8		8			
	14	9	8	9		8			
	15	8	8	9		8			
	16	8	8	8		8			
	17	8	8	8		8			
	18	9	9	8		8			
	19	8	8	8		8			
	20	9	9	8		8			
	21	8	8	8		8			
	22	8	9	8		8			
	23	8	8	8		8			
	24	8	8	8		8			
	25	8	8	8		8			
	26	8	8	8		8			
	27	9	9	8		9			
	28	9	8	8		8			
	29	8	8	7		7			

3. Results for the Field-study Testing (Continued)

Unit	Student	Exercise			$\bar{X}$	Self Test		E₁	E₂
		Ex. 1	Ex. 2	Ex. 3		Test	$\bar{F}$		
2	30	8	8	8	**8.16**	8	**8.12**	**81.60**	**81.23**
	31	8	8	7		7			
	32	8	8	9		8			
	33	9	8	8		8			
	34	9	9	8		8			
	35	9	8	8		8			
	36	8	8	8		8			
	37	9	8	8		8			
	38	8	8	8		8			
	39	8	8	8		8			
	40	8	8	8		8			
	41	9	9	8		9			
	42	8	8	8		8			
	43	9	9	8		8			
	44	9	8	8		8			
3	1	8	8	8	**8.40**	8	**8.00**	**80.40**	**80.00**
	2	8	8	8		8			
	3	9	8	8		8			
	4	8	8	7		7			
	5	8	8	8		8			
	6	8	8	7		8			
	7	9	8	8		8			
	8	8	8	7		8			
	9	8	8	8		8			
	10	9	8	8		8			
	11	8	8	8		8			
	12	8	8	7		7			
	13	9	8	8		8			
	14	8	8	9		8			
	15	8	8	8		8			
	16	8	8	7		8			
	17	8	8	8		8			
	18	9	9	8		8			
	19	8	8	8		8			
	20	9	9	8		9			
	21	8	8	8		8			

3. Results of the Field-study Testing (Continued)

Unit	Student	Exercise			$\bar{X}$	Self Test		E₁	E₂
		Ex 1	Ex 2	Ex 3		Test	$\bar{F}$		
3	22	8	8	8	**8.04**	8	**8.00**	**80.40**	**80.00**
	23	8	8	8		8			
	24	8	8	8		8			
	25	8	8	7		7			
	26	8	8	8		8			
	27	9	8	7		8			
	28	8	8	8		8			
	29	8	8	7		8			
	30	7	8	8		8			
	31	8	8	8		8			
	32	9	9	8		9			
	33	9	9	8		8			
	34	8	8	7		8			
	35	8	8	8		8			
	36	8	8	8		8			
	37	9	8	8		8			
	38	8	8	8		8			
	39	8	8	8		8			
	40	8	9	8		8			
	41	8	8	8		8			
	42	8	8	8		8			
	43	8	8	8		8			
	44	8	8	7		8			

4. Results of the Experiment (Tryal-run)

Unit	Student	Exercises (30 pts.)			$\overline{X}$	Self Test		E_1	E_2
		Ex 1	Ex 2	Ex 3		Test	$\overline{F}$		
1	S1	8	7	8	8.16	8	8.14	81.63	81.47
	S2	8	8	9		8			
	S3	8	8	8		8			
	S4	8	8	8		8			
	S5	8	8	8		8			
	S6	8	8	8		8			
	S7	8	8	8		8			
	S8	8	8	7		7			
	S9	8	8	8		8			
	S10	8	8	8		8			
	S11	8	8	9		8			
	S12	8	8	8		8			
	S13	8	8	7		8			
	S14	8	8	8		8			
	S15	8	7	8		9			
	S16	8	8	9		8			
	S17	8	8	8		8			
	S18	8	8	8		8			
	S19	8	8	8		8			
	S20	8	9	8		8			
	S21	8	8	8		7			
	S22	8	9	8		9			
	S23	9	9	8		8			
	S24	8	8	8		7			
	S25	9	9	8		9			
	S26	9	9	8		8			
	S27	9	8	8		8			
	S28	8	8	8		8			
	S29	8	8	8		8			
	S30	8	7	8		8			
	S31	8	7	8		8			
	S32	8	8	8		8			
	S33	8	9	9		9			
	S34	8	8	9		8			
	S35	8	9	8		8			
	S36	9	8	8		8			
	S37	7	8	8		7			

4. Results of the Experiment (Continued)

Unit	Student	Exercises (30 pts.)				Self Test		E_1	E_2
		Ex. 1	Ex. 2	Ex. 3	$\overline{X}$	Test	$\overline{F}$		
1	S38	9	8	9	8.16	9	8.14	81.63	81.47
	S39	8	8	8		8			
	S41	8	8	7		7			
	S42	8	8	7		8			
	S43	8	8	8		8			
	S44	9	8	8		8			
	S45	9	9	8		9			
	S46	8	9	8		9			
	S47	8	8	8		8			
	S48	9	8	8		8			
	S49	8	9	9		8			
	S50	8	9	8		8			
	S51	8	8	8		8			
	S52	9	8	8		8			
	S53	9	7	8		9			
	S54	8	8	9		8			
	S55	7	7	8		8			
	S56	8	8	8		8			
	S57	9	8	8		9			
	S58	8	8	8		8			
	S59	8	7	8		7			
	S60	9	9	8		8			
	S61	9	9	8		9			
	S62	9	9	8		9			
	S63	9	8	8		8			
	S64	9	8	8		8			
	S65	9	8	8		8			
	S66	9	8	8		8			
	S67	8	8	8		8			
	S68	9	8	8		8			
	S69	9	8	8		8			
	S70	9	9	8		8			
	S71	9	8	8		9			
	S72	9	8	9		8			
	S73	8	8	8		7			
	S74	9	9	7		8			
	S75	8	8	7		8			

4. Results of the Experiment (Continued)

Unit	Student	Exercises (30 pts.)				Self test		E_1	E_2
		Ex. 1	Ex. 2	Ex. 3	$\bar{X}$	Test	$\bar{F}$		
1	S76	9	9	8	8.16	9	8.14	81.63	81.47
	S77	9	9	8		8			
	S78	8	8	9		9			
	S79	8	8	8		8			
	S80	9	8	8		8			
	S81	9	8	8		9			
	S82	9	7	9		9			
	S83	9	8	8		8			
	S84	9	7	8		8			
	S85	9	8	8		8			
	S86	8	8	8		8			
	S87	8	8	8		8			
	S88	8	8	8		8			
	S89	9	8	8		8			
	S90	8	8	8		9			
	S91	9	8	8		9			
	S92	9	8	8		9			
	S93	9	8	8		8			
	S94	8	9	8		9			
	S95	8	8	8		8			
2	S1	8	9	9	8.17	9	8.13	81.75	81.38
	S2	8	8	8		8			
	S3	9	8	8		8			
	S4	8	8	8		8			
	S5	8	8	9		8			
	S6	9	8	8		9			
	S7	9	8	8		8			
	S8	8	7	8		8			
	S9	8	8	8		8			
	S10	8	8	9		8			
	S11	8	9	9		8			
	S12	8	9	8		9			
	S13	8	9	9		9			
	S14	8	8	8		8			
	S15	9	9	8		8			
	S16	8	8	9		8			

4. Results of the Experiment (Continued)

Unit	Student	Exercises (30 pts.)				Self test		E_1	E_2
		Ex. 1	Ex. 2	Ex. 3	$\overline{X}$	Test	$\overline{F}$		
2	S17	8	8	8	8.17	8	8.13	81.75	81.38
	S18	8	8	7		8			
	S19	8	8	8		8			
	S20	8	8	8		8			
	S21	8	8	7		8			
	S22	9	9	8		8			
	S23	8	8	8		8			
	S24	7	8	8		8			
	S25	9	9	9		8			
	S26	9	8	8		8			
	S27	8	8	8		8			
	S28	8	8	8		8			
	S29	8	8	8		8			
	S30	8	7	8		8			
	S31	8	7	8		8			
	S32	8	8	8		8			
	S33	8	9	9		9			
	S34	8	8	9		8			
	S35	8	9	8		8			
	S36	8	8	8		8			
	S37	8	8	7		8			
	S38	9	8	9		9			
	S39	8	8	8		8			
	S40	9	9	9		8			
	S41	8	8	7		8			
	S42	8	8	7		8			
	S43	8	8	8		7			
	S44	8	8	8		8			
	S45	9	9	9		9			
	S46	8	8	7		8			
	S47	8	8	8		8			
	S48	8	8	8		8			
	S49	9	8	9		9			
	S50	8	9	8		8			
	S51	8	8	7		8			
	S52	9	8	8		8			
	S53	9	9	9		9			

4. Results of the Experiment (Continued)

Unit	Student	Exercises (30 pts.)			$\bar{X}$	Self Test		E_1	E_2
		Ex 1	Ex 2	Ex 3		Test	$\bar{F}$		
2	S54	8	8	9	8.17	8	8.13	81.75	81.38
	S55	7	8	8		8			
	S56	8	8	8		8			
	S57	9	9	9		9			
	S58	8	8	8		8			
	S59	8	7	8		8			
	S60	9	9	8		9			
	S61	9	9	8		8			
	S62	9	9	8		8			
	S63	8	8	8		8			
	S64	8	8	7		8			
	S65	8	8	8		8			
	S66	9	7	8		8			
	S67	8	8	8		8			
	S68	8	8	8		8			
	S69	9	8	8		8			
	S70	9	9	8		9			
	S71	8	8	8		8			
	S72	8	8	7		8			
	S73	8	7	8		8			
	S74	8	8	8		8			
	S75	8	9	8		8			
	S76	9	8	8		8			
	S77	9	9	8		9			
	S78	8	9	9		8			
	S79	8	8	8		8			
	S80	8	8	8		8			
	S81	8	8	8		8			
	S82	9	9	9		9			
	S83	8	8	8		8			
	S84	9	8	8		8			
	S85	8	8	8		8			
	S86	8	8	8		8			
	S87	8	8	8		8			
	S88	8	8	8		8			
	S89	8	8	8		8			
	S90	9	8	8		8			

4. Results of the Experiment (Continued)

Unit	Student	Exercises (30 pts.)			$\overline{X}$	Self Test		E₁	E₂
		Ex 1	Ex 2	Ex 3		Test	$\overline{F}$		
2	S91	8	8	8	8.17	8	8.13	81.75	81.38
	S92	9	8	8		8			
	S93	8	8	8		8			
	S94	8	9	8		8			
	S95	9	8	8		9			
3	S1	9	8	7	8.06	8	8.02	80.67	80.23
	S2	8	8	8		8			
	S3	8	8	7		8			
	S4	8	8	7		8			
	S5	8	8	7		8			
	S6	8	8	8		8			
	S7	8	8	8		8			
	S8	8	7	7		8			
	S9	8	8	7		8			
	S10	9	9	8		9			
	S11	8	8	9		9			
	S12	8	9	9		8			
	S13	9	9	9		9			
	S14	8	8	8		8			
	S15	9	9	8		8			
	S16	8	8	9		8			
	S17	7	8	8		8			
	S18	7	8	8		8			
	S19	7	8	8		8			
	S20	8	8	8		8			
	S21	8	8	7		8			
	S22	9	9	9		9			
	S23	8	7	8		8			
	S24	8	7	8		8			
	S25	9	8	8		8			
	S26	8	7	8		8			
	S27	7	8	8		8			
	S28	8	8	8		8			
	S29	7	8	8		8			
	S30	8	7	8		8			
	S31	7	8	8		8			
	S32	8	8	8		8			

4. Results of the Experiment (Continued)

Unit	Student	Exercises (30 pts.)			$\overline{X}$	Self Test		E_1	E_2
		Ex 1	Ex 2	Ex 3		Test	$\overline{F}$		
3	S33	9	9	9	8.06	9	8.02	80.67	80.23
	S34	8	8	9		7			
	S35	8	8	8		8			
	S36	8	8	8		8			
	S37	7	8	8		8			
	S38	9	8	8		9			
	S39	8	8	8		7			
	S40	8	9	9		8			
	S41	8	8	7		8			
	S42	8	8	8		8			
	S43	7	8	8		8			
	S44	8	7	8		8			
	S45	9	9	9		8			
	S46	8	9	7		8			
	S47	8	8	8		8			
	S48	7	7	8		7			
	S49	8	8	9		8			
	S50	8	9	8		8			
	S51	8	8	7		8			
	S52	8	8	8		8			
	S53	9	9	9		9			
	S54	8	8	9		8			
	S55	7	8	8		8			
	S56	8	8	8		8			
	S57	9	9	9		9			
	S58	8	8	8		8			
	S59	8	7	8		7			
	S60	9	9	8		8			
	S61	9	9	9		9			
	S62	9	8	8		8			
	S63	8	8	7		8			
	S64	8	8	7		7			
	S65	8	9	9		8			
	S66	9	8	8		8			
	S67	9	8	8		8			
	S68	8	7	8		8			

4. Results of the Experiment (Continued)

Unit	Student	Exercises (30 pts.)			$\bar{X}$	Self Test		E_1	E_2
		Ex 1	Ex 2	Ex 3		Test	$\bar{F}$		
3	S69	8	8	7	8.06	8	8.02	80.67	80.23
	S70	9	8	8		8			
	S71	8	8	8		7			
	S72	8	8	8		8			
	S73	8	7	8		7			
	S74	8	8	8		8			
	S75	8	9	8		9			
	S76	8	8	7		8			
	S77	9	8	8		8			
	S78	9	8	9		8			
	S79	8	8	8		8			
	S80	8	8	8		8			
	S81	8	8	8		8			
	S82	8	8	8		8			
	S83	8	8	8		8			
	S84	8	8	7		8			
	S85	8	8	8		8			
	S86	8	7	8		7			
	S87	8	7	8		8			
	S88	8	8	8		8			
	S89	8	8	8		8			
	S90	8	8	8		8			
	S91	8	9	9		8			
	S92	8	9	9		8			
	S93	8	8	8		8			
	S94	9	8	8		8			
	S95	8	8	8		8			

APPENDIX B

Lesson Plan for

Wiki-based Collaborative Reading Lessons
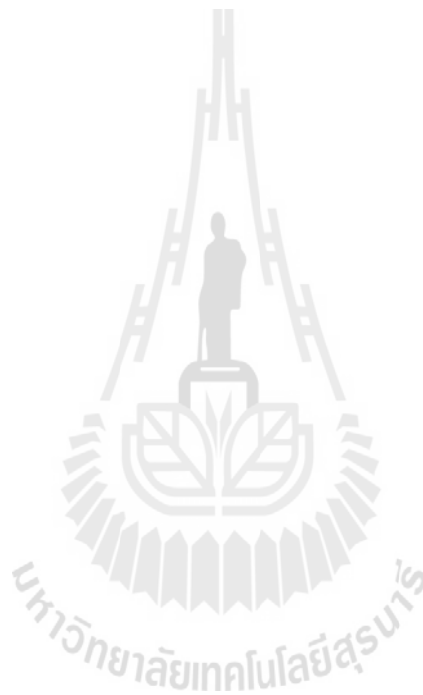
Unit 1 Health Care

I.   **Proficiency Level: Intermediate**

II.   **Trimester: 2/2013**

III.   **Periods: 2 periods (100 minutes)**

IV.   **Objectives**

Students will be able to

- express and share opinions related to the topic of health care with peers;

- understand more words related to health care;

- make prediction of the reading text;

- identify the main ideas and supporting details of the reading text.

V.   Teaching Procedure

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
2	Pre-reading	- Activate students' background knowledge related to "snoring and symptoms" - Encourage the students to discuss with teammates to predict what they are going to read.	(1) Teacher asks the students to log on to "pbworks". (2) Teacher asks the students to go to *Unit 1 "Health Care"* and let them explore the first page of the unit page. (3) Teacher asks the students to do the discussion activity by answering the questions provided such as *"Do you think snoring can be an indicator of your health? Why?,"* provided at the end of the page. (4) Teacher asks the students to go to their group's page available below the questions, and lets them discuss with their groups in the *"Comment Box"* at the end of the page.	5 mins. 5 mins 15 mins.	Individual Individual Collaborative	- Students' discussion	- S-S - T-S - S-S - T-S

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
2	Pre-reading		(5) Teacher monitors the students and provides help or support when necessary. For example, Teacher may start a guiding answer or idea in response to the question, or he may encourage the students who do not express their opinions or do not participate in the discussion. (6) Teacher asks the students to assign a member of their group to post the answers the group has agreed upon.			- Students' answers in the comment box	
		- Provide knowledge of necessary words related to the topic.	(7) Teacher asks the students to go Page 3 to do the vocabulary exercise **individually** by clicking at the link "*Vocabulary Exercise*."	10 mins.	Individual		

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Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
2			(8) The teacher tells the students that they are allowed to do each exercise **as many as three times**, and only the best score will be recorded.			- Students' online discussion	- S-S - T-S
	Pre-Reading	- Provide knowledge of necessary words related to the topic.	(9) Teacher asks the students to go *Page 3* to do the vocabulary exercise **individually** by clicking at the link "*Vocabulary Practice.*" Tell the students that they are allowed to do each practice as many times as they like.	10 mins.	Individual	- Online exercise	- T-S

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
		- Test the students' knowledge of vocabulary related to the topic.	(10) On the same page, the teacher asks the students to do online quiz on vocabulary by clicking at the link "*Vocabulary Exercise*." Remind the students that they are allowed to do the exercise **up to 3 times**, and only the best score is recorded.	5 mins.	Individual	- Online quiz	- T-S
3	**While-reading**	- Provide explanation of guessing meaning from context, identifying topics and main idea.	(1) Teacher asks the students to go to *Page 4*, and asks them to individually study the topic *"Reading Strategies,"* which explains four reading strategies: guessing meaning from contexts, identifying main ideas and supporting details, and making inferences.	10 mins.	Individual	-	- T-S

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
3	**While-reading**	- Let the students study the use of reading strategies such as guessing meaning from contexts, identifying main ideas and supporting details, and making inferences.	(2) Teacher has the students do the online exercises on identifying main ideas, supporting details, and making inferences by clicking at the links provided in each lessons.	5 mins	Individual	-	- T-S
		- Practice the use of reading strategies learned from the *"Reading Strategies"* Lessons.	(3) Teacher asks the students to go *Page 5*, and then ask them to go to their group's page by clicking at their group's name.	15 mins.	Collaborative	- Students' online discussion	- S-S - T-S
			(4) In the group's page of the students, there is a reading passage about snoring. Let them read the passage **paragraph by paragraph**.				

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Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
3			(5) Teacher asks the students to discuss with their group about the key words and main idea of each paragraph by posting their ideas in the comment box at the bottom of the page. (6) Teacher monitors students' discussion and may provide some help such as guidance or encouraging passive students to get involved in group discussion. (7) Teacher asks each group to have a representative to summarize the group's agreed answers in the comment box of the group's page.		Collaborative	- Students' online discussion	- S-S - T-S

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Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
3		- Practice the use of reading strategies learned from the *"Reading Strategies"* exercises.	(8) Students **individually** do the online exercises on identifying main ideas, supporting details, and making inferences by clicking at the links provided. Students are allowed to make as many as three attempts for each exercise, and only the score of the best attempt is recorded.	15 mins.	Individual	- Online exercise	- T-S
			(9) Teacher asks the students to go to *Page 6* to do the end-of-unit quiz.	10 mins.		- Online quiz	
3	**Post-reading**	- Use the knowledge gained from the reading passage.	(1) Teacher asks the students to discuss with their groups to answers end-of-unit questions. (2) Teacher designates the deadline of the submission of the group's discussion and the end-of-unit quiz.	Out-of-class time	Collaborative		- S-S - T-S

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Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
		Test student's knowledge gained from the lessons.	(3) Teacher checks the students' work progress, and may encourage each group to submit their agreed answers in the comment box of the group's page before the deadline.		Individual	- Students' online discussion	- T-S

** *Note*

1. Interactive Patterns: T – S   = Teacher-Student(s) Interaction

   S – S = Student – Student(s) Interaction

2. All vocabulary practices **<u>do not</u>** require the students to log on.

3. All exercises and quizzes require the students to log on.

4. Always remind the students that **each quiz** can be done only **<u>once</u>**.

Unit 2 Animal Studies

I.   Proficiency Level: Intermediate

II.   Trimester: 2/2013

III. Periods: 2 periods (100 minutes)

IV.   Objectives

Students will be able to

- express and share opinions related to the topic of animal studies;

- understand more words related to animal studies;

- make prediction of the reading text;

- identify the main ideas and supporting details, and make inferences of the reading text.

V.   Teaching Procedure

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
4	**Pre-reading**		(1) Teacher asks the students to log on to "pbworks".	5 mins.	Individual		- S-S - T-S
			(2) Teacher asks the students to go to *Unit 2 "Animal Studies"* and let them explore the first page of the unit page.	5 mins	Individual		
			(3) Teacher asks the students to do the discussion activity by answering the questions provided such as *"Do you think what animal is the most intelligent after the human? Why?"* provided at the end of the page.		Collaborative	- Students' discussion	- S-S - T-S
			(4) Teacher asks the students to go to their group's page available below the questions, and lets them discuss with their groups in the *"Comment Box"* at the end of the page.	15 mins.			

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Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
4	Pre-reading		(5) Teacher monitors the students and provides help or support when necessary. For example, Teacher may start a guiding answer or idea in response to the question, or he may encourage the students who do not express their opinions or do not participate in the discussion.				
			(6) Teacher asks the students to assign a member of their group to post the answers the group has agreed upon.			- Students' answers in the comment box	
		- Provide knowledge of necessary words related to the topic.	(7) Teacher asks the students to go Page 3 to do the vocabulary exercise **individually** by clicking at the link "*Vocabulary Exercise.*"	10 mins.	Individual	- Online exercise	- T-S

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
4			(8) The teacher tells the students that they are allowed to do each exercise **as many as three times**, and only the best score will be recorded.			- Students' online discussion	- S-S - T-S
	Pre-Reading	- Provide knowledge of necessary words related to the topic.	(9) Teacher asks the students to go *Page 3* to do the vocabulary exercise **individually** by clicking at the link "*Vocabulary Practice.*" Tell the students that they are allowed to do each practice as many times as they like.	10 mins.	Individual	- Online exercise	- T-S

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
		- Test the students' knowledge of vocabulary related to the topic.	(10) On the same page, the teacher asks the students to do online quiz on vocabulary by clicking at the link "*Vocabulary Exercise.*" Remind the students that they are allowed to do the exercise **up to 3 times**, and only the best score is recorded.	5 mins.	Individual	- Online quiz	- T-S
5	**While-reading**	- Provide explanation of guessing meaning from context, identifying topics and main idea.	(1) Teacher asks the students to go to *Page 4*, and asks them to individually study the topic *"Reading Strategies,"* which explains four reading strategies: guessing meaning from contexts, identifying main ideas and supporting details, and making inferences.	10 mins.	Individual	-	- T-S

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Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
5	**While-reading**	- Let the students study the use of reading strategies such as guessing meaning from contexts, identifying main ideas and supporting details, and making inferences.	(2) Teacher has the students do the online exercises on identifying main ideas, supporting details, and making inferences by clicking at the links provided in each lessons.	5 mins	Individual	-	- T-S
		- Practice the use of reading strategies learned from the *"Reading Strategies"* Lessons.	(3) Teacher asks the students to go *Page 5*, and then ask them to go to their group's page by clicking at their group's name.	15 mins.	Collaborative	- Students' online discussion	- S-S - T-S
			(4) In the group's page of the students, there is the reading passage *"The Second Most Intelligent Animal."* Let them read the passage **paragraph by paragraph**.				

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Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
5	While-reading		(5) Teacher asks the students to discuss with their group about the key words and main idea of each paragraph by posting their ideas in the comment box at the bottom of the page. (6) Teacher monitors students' discussion and may provide some help such as guidance or encouraging passive students to get involved in group discussion. (7) Teacher asks each group to have a representative to summarize the group's agreed answers in the comment box of the group's page.		Collaborative	- Students' online discussion	- S-S - T-S

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Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
5	Post-reading	- Practice the use of reading strategies learned from the *"Reading Strategies"* exercises. - Use the knowledge gained from the reading passage.	(1) Students **individually** do the online exercises on identifying main ideas, supporting details, and making inferences by clicking at the links provided. Students are allowed to make as many as three attempts for each exercise, and only the score of the best attempt is recorded. (2) Teacher asks the students to go to *Page 6* to do the end-of-unit quiz.	15 mins. 10 mins.	Individual	- Online exercise - Online quiz - Students' online discussion	- T-S - S-S - T-S

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Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
5	Post-reading	Test student's knowledge gained from the lessons.	(3) Teacher designates the deadline of the submission of the group's discussion and the end-of-unit quiz. (4) Teacher checks the students' work progress, and may encourage each group to submit their agreed answers in the comment box of the group's page before the deadline.	Out-of-class time (by 3 days)	Individual	- Students' online discussion	- T-S

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Unit 3 Food and Nutrition

I.   Proficiency Level: Intermediate

II.   Trimester: 2/2013

III.   Periods: 2 periods (100 minutes)

IV.   Objectives

Students will be able to

- express and share opinions related to the topic of food and nutrition;

- understand more words related to food and nutrition;

- make prediction of the reading text;

- identify the main ideas and supporting details, and make inferences of the reading text.

V.   Teaching Procedure

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
7	Pre-reading	- Activate students' background knowledge related to "apes and their behaviors" - Encourage the students to discuss with teammates to predict what they are going to read.	(1) Teacher asks the students to log on to "pbworks". (2) Teacher asks the students to go to *Unit 2 "Animal Studies"* and let them explore the first page of the unit page. (3) Teacher asks the students to do the discussion activity by describing the pictures provided and answering the questions provided such as *"What do you think what people in the pictures are doing? Where are they?"* (4) Teacher asks the students to go to their group's page available below the questions, and lets them discuss with their groups in the *"Comment Box"* at the end of the page.	5 mins. 5 mins 15 mins.	Individual Individual Collaborative	- Students' discussion	- S-S - T-S - S-S - T-S

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
7	Pre-reading		(5) Teacher monitors the students and provides help or support when necessary. For example, Teacher may start a guiding answer or idea in response to the question, or he may encourage the students who do not express their opinions or do not participate in the discussion. (6) Teacher asks the students to assign a member of their group to post the answers the group has agreed upon.			- Students' answers in the comment box	
		- Provide knowledge of necessary words related to the topic.	(7) Teacher asks the students to go Page 3 to do the vocabulary exercise individually by clicking at the link "Vocabulary Exercise."	10 mins.	Individual	- Online exercise	- T-S

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
7			(8) The teacher tells the students that they are allowed to do each exercise **as many as three times**, and only the best score will be recorded.			- Students' online discussion	- S-S - T-S
	Pre-Reading	- Provide knowledge of necessary words related to the topic.	(9) Teacher asks the students to go *Page 3* to do the vocabulary exercise **individually** by clicking at the link "*Vocabulary Practice.*" Tell the students that they are allowed to do each practice as many times as they like.	10 mins.	Individual	- Online exercise	- T-S

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
		- Test the students' knowledge of vocabulary related to the topic.	(10) On the same page, the teacher asks the students to do online quiz on vocabulary by clicking at the link "*Vocabulary Exercise*." Remind the students that they are allowed to do the exercise **up to 3 times**, and only the best score is recorded.	5 mins.	Individual	- Online quiz	- T-S
8	**While-reading**	- Provide explanation of guessing meaning from context, identifying topics and main idea.	(1) Teacher asks the students to go to *Page 4*, and asks them to individually study the topic *"Reading Strategies,"* which explains four reading strategies: guessing meaning from contexts, identifying main ideas and supporting details, and making inferences.	10 mins.	Individual	-	- T-S

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
8	**While-reading**	- Let the students study the use of reading strategies such as guessing meaning from contexts, identifying main ideas and supporting details, and making inferences. - Practice the use of reading strategies learned from the *"Reading Strategies"* Lessons.	(2) Teacher has the students do the online exercises on identifying main ideas, supporting details, and making inferences by clicking at the links provided in each lesson. (3) Teacher asks the students to go *Page 5*, and then ask them to go to their group's page by clicking at their group's name. (4) In the group's page of the students, there is a reading passage entitled *"The Changing Global Diet"*.	5 mins 15 mins.	Individual Collaborative	- - Students' online discussion	- T-S - S-S - T-S

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
8	While-reading		(5) Teacher asks the students to discuss with their group about the key words and main idea of each paragraph by posting their ideas in the comment box at the bottom of the page. (6) Teacher monitors students' discussion and may provide some help such as guidance or encouraging passive students to get involved in group discussion. (7) Teacher asks each group to have a representative to summarize the group's agreed answers in the comment box of the group's page.		Collaborative	- Students' online discussion	- S-S - T-S

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
8	While-reading	- Practice the use of reading strategies learned from the *"Reading Strategies"* exercises.	(8) Students **individually** do the online exercises on identifying main ideas, supporting details, and making inferences by clicking at the links provided. Students are allowed to make as many as three attempts for each exercise, and only the score of the best attempt is recorded. (9) Teacher asks the students to go to *Page 6* to do the end-of-unit quiz.	15 mins.

10 mins. | Individual | - Online exercise

- Online quiz | - T-S |
| | Post-reading | - Use the knowledge gained from the reading passage. | (1) Teacher asks the students to discuss with their groups to answers end-of-unit questions. (2) Teacher designates the deadline of the submission of the group's discussion. | Out-of-class time (3 days) | Collaborative | - Students' online discussion | - S-S - T-S |

Period	Teaching Phase	Activity	Learning and Teaching Activity	Duration	Type of Learning	Assessment	Interactive Pattern
	Post-reading	Test student's knowledge gained from the lessons.	(3) Teacher checks the students' work progress, and may encourage each group to submit their agreed answers in the comment box of the group's page before the deadline.	Out-of-class time (3 days)	Individual	- Students' online discussion	- T-S

APPENDIX C

Item Analysis for the Pre- and Post-tests

Results of item analysis showing the level of difficulty (p), the discrimination index (r), and reliability of the pre-test and post-test of WCR lessons (80 items)

Item	R_H	R_L	p	r	Pre-test	Post-test
1	35	17	0.43	0.58		
2	57	51	0.90	0.94		
3	44	18	0.52	0.72		✔
4	42	29	0.59	0.69		✔
5	27	8	0.29	0.45		
6	25	12	0.31	0.41		
7	37	26	0.53	0.61		✔
8	42	35	0.64	0.69		✔
9	43	26	0.58	0.71		✔
10	31	27	0.48	0.51		
11	47	24	0.59	0.77		✔
12	58	47	0.88	0.95		
13	46	45	0.76	0.75		✔
14	37	20	0.48	0.61		
15	29	40	0.58	0.47		
16	30	20	0.42	0.49		
17	39	23	0.52	0.64		✔
18	40	25	0.54	0.66		✔
19	48	29	0.64	0.79		✔
20	45	27	0.60	0.74		✔

Item analysis results showing the level of difficulty (p), the discrimination index (r), and reliability of the pre- and post-tests of WCR lessons (80 items) (Cont.)

Item	R_H	R_L	p	r	Pre-test	Post-test
21	46	15	0.51	0.76		
22	41	30	0.59	0.67		✓
23	37	10	0.39	0.61		
24	30	40	0.58	0.49		
25	46	20	0.55	0.76		✓
26	51	31	0.68	0.84		✓
27	34	28	0.52	0.56		✓
28	11	9	0.17	0.18		
29	25	8	0.28	0.41		
30	51	7	0.48	0.84		
31	52	34	0.72	0.85		✓
32	58	48	0.88	0.95		
33	54	46	0.83	0.89		
34	57	45	0.85	0.94		
35	33	29	0.52	0.54		
36	50	29	0.66	0.82		✓
37	44	21	0.54	0.72		✓
38	49	39	0.73	0.80		✓
39	27	16	0.36	0.44		
40	52	32	0.70	0.86		✓
41	39	28	0.56	0.64	✓	

Item analysis results showing the level of difficulty (p), the discrimination index (r), and reliability of the pre- and post-tests of WCRI lessons (80 items) (Cont.)

Item	R_H	R_L	p	r	Pre-test	Post-test
42	41	19	0.50	0.68	✔	
43	43	20	0.53	0.71	✔	
44	40	35	0.63	0.66	✔	
45	38	22	0.50	0.63	✔	
46	26	15	0.34	0.43		
47	29	17	0.38	0.48		
48	26	13	0.33	0.43		
49	34	11	0.38	0.56		
50	50	23	0.61	0.82	✔	
51	29	10	0.33	0.48		
52	41	22	0.53	0.67	✔	
53	42	23	0.54	0.69	✔	
54	42	28	0.58	0.69	✔	
55	38	21	0.49	0.63		
56	33	13	0.38	0.54		
57	23	16	0.33	0.38		
58	21	17	0.32	0.34		
59	20	22	0.35	0.33		
60	30	19	0.41	0.49		
61	43	39	0.68	0.71	✔	
62	49	33	0.68	0.81	✔	
63	26	5	0.26	0.43		

Item analysis results showing the level of difficulty (p), the discrimination index (r), and reliability of the pre- and post-tests of WCR lessons (80 items) (Cont.)

Item	R_H	R_L	p	r	Pre-test	Post-test
64	38	15	0.44	0.63	✔	
65	31	19	0.42	0.51		
66	30	12	0.35	0.49		
67	19	23	0.35	0.31		
68	47	36	0.69	0.77	✔	
69	39	22	0.51	0.64	✔	
70	32	20	0.43	0.53		
71	22	5	0.23	0.36		
72	19	12	0.26	0.31		
73	37	30	0.56	0.61	✔	
74	51	38	0.74	0.84	✔	
75	57	37	0.78	0.94	✔	
76	42	29	0.59	0.69	✔	
77	27	8	0.29	0.45		
78	25	12	0.31	0.41		
79	37	26	0.53	0.61	✔	
80	42	35	0.64	0.69	✔	
Cronbach's α					0.87	0.79

Note: R_H = Number of students who correctly answered in the high group

R_L = Number of students who correctly answered in the low group

APPENDIX D

Pre-test and Post-test of Wiki-based Collaborative

Reading (WCR) Lessons

1. Pretest:

Instructions: Read the following passages and answer the questions that follow by choosing the best alternatives using the information in the passages.

Passage 1

[1]The elephant is the largest land animal. It is found wild in India and Africa. However, the African elephant is larger than the Indian elephant. The former has longer tusks and beiger ears. In both countries, elephant live in herds in the jungles. The elephant is a naturally shy animal. It usually likes to stay away from men. It lives entirely on leaves of trees, grass, roots and bulbs.

[2]The trunk is the elephant's most amazing part and is put to various uses. The elephant draws water by its trunk and it can squirt water all over its body like a shower bath. It uses its trunk to pick leaves from the tree and put them into its mouth. In fact, its trunk serves the elephant as a long arm and hand.

[3]The elephant is a very smart animal. It is very strong too. When **tamed** (trained to live with people), it can be a very useful servant to man. In fact, it has been trained to serve man in many ways. For example, an elephant can carry heavy loads such as timber. The trained elephant can kneel down, lift a heavy log of wood with its tusks, carry it to the place where it is wanted, and place it exactly in position.

4In Africa, elephants are hunted mainly for their tusks, which are made of ivory and are very **valuable**. Their skins are so thick that they cannot be pierced through by a normal bullet. Hunters must use special bullets to shoot them down.

5Many elephants are caught alive to be trained for hard work. However, catching elephants alive is difficult and very dangerous. Although the elephant is shy, but when it is alone in the wild, it can be dangerous and threatening to human.   People usually use traps or enclosures to catch wild elephants. They use well-trained elephants, which are called "**decoys**," to lead the target wild animals into captivity.

1. The best topic of Paragraph 3 is …….
        a) How people train the elephant to work
        b) Why people train the elephant to work
        c) The abilities and intelligence of the elephant
        d) The use of elephants to carry timber

2. The best topic of Paragraph 4 is…..
        a) Life of the elephant in Africa
        b) The hunt of the elephant in Africa
        c) The price of elephant tusks
        d) The thickness of elephant skin

3. Wild elephants always live ….
        a) alone by itself   b) together in group
        c) in pairs   d) with people

4. The ……… is the most interesting part of an elephant.
        a) ear   b) skin   c) tusk   d) trunk

5. The elephant can be easily trained by human to do wok because it is……

    a) large   b) strong

    c) intelligent   d) not threatening

6. Elephants that live in the jungles of India and Africa are……

    a) large   b) intelligent

    c) tame   d) wild

7. The word "valuable" in Paragraph 4 is closest to the following meaning….

    a) cheap   b) expensive

    c) old   d) large

8. It is difficult and dangerous to …..

    a) shoot an elephant with a gun   b) catch elephants alive

    c) pierce the elephant's skins   d) tame and train elephants

9. "Decoys" are tamed elephants that are trained to…..

    a) do difficult and dangerous work   b) carry heavy logs

    c) perform tricks   d) help trap wild elephants

10. A suitable title for the passage is ……

    a) The Elephant   b) Hunting Elephants Alive

    c) Wild Elephants of India and Africa d) Training Elephants to do Work

****

Passage 2

1   Louis Pasteur was born on December 27, 1822, seven years after the Battle in

Waterloo, one of the greatest battles of Napoleon. Unlike his father who bravely fought

for Napoleon, Louis Pasteur was not a soldier, but he was a fighter. He fought disease.

5   He spent most of his life on the study of what we sometimes call germs or microbes

which scientists call "bacteria," a Greek word that means "little rods." Bacteria are

vegetable organisms which live in the air, water and soil, and in the bodies of animals

and plants. Some but not all of microbes are the cause of diseases, some transform

organic matter into food for plants.

        Louis Pasteur had a very busy but interesting life. He did not only study germs

10   and made a lot of great discoveries, but he also used them in practical ways. He worked

hard in his laboratory with test tubes and many kinds of interesting experiments. One of

his most remarkable **masterpieces** was the development of a medical process that is

10   still in use today, pasteurization. This process keeps milk free from germs. It involves

heating the milk to 140° F (60° C) for 30 minutes. The milk is then cooled and stored in

sterile containers, containers where bacteria cannot grow. This process makes the milk

last longer and safe to drink.

15   Although most of his experiments were on germs, Pasteur also spent a great

deal of time studying the cause of many fatal diseases such as smallpox and anthrax.

Another piece of his best-known work was the development of vaccine for rabies.

Rabies was a **fatal** disease with horrible symptoms. People get rabies from being bitten

20   by an infected animal, especially dogs. A person who develops the disease usually dies.

In 1880, the number of dogs with rabies increased in Paris, and it became very

frightening to people. So, Pasteur started to study seriously about this virus and tried to

develop a vaccine for this dangerous disease. After five years of serious experiments, Pasteur could finally develop the vaccine for rabies.

25   Pasteur's discoveries could save a lot of people in his country. Among the people whom Pasteur was able to help were brewers, breeders of silk worms, and cow keepers. These people were very important in developing major industries in France. Pasteur was always very proud of being able to help his country **this way**.

11. The year the Battle of Waterloo happened was…

    a) 1815   b) 1822

    c) 1880   d) not mentioned in the text

12. Which word means "little rods" in Greek?

    a) Germs   b) Microbes

    c) Bacteria   d) All of these.

13. For what did Pasteur spend most of his life?

    a) For fighting disease in Napoleon's Army.

    b) For being a brave soldier.

    c) For the study of germs.

    d) For serving Napoleon in wars.

14. What does **"good"** germs do?

    a) Change matter into food for animals

    b) Change plants into food.

    c) Change matter into food for plants

    d) change disease into food.

15. The word "**fatal**" in line 19 means…..

    a) sudden   b) very dangerous

    c) widespread   d) unable to cure

16. Why did Pasteur study about rabies?

    a) Because he wanted to study about germs.

    b) Because the government asked him to do it.

    c) Because he had already studied about diseases.

    d) Because he wanted to be famous.

17. What happened in 1880 in Paris?

    a) There were too many dogs with rabies.

    b) Pasteur started to work on anthrax.

    c) Pasteur could successfully develop a vaccine against rabies.

    d) The number of rabies victims was increasing.

18. What is the main idea of Paragraph 3?

    a) A lot of people in Paris died of rabies in 1880.

    b) Luis Pasteur did a lot of studies on dangerous diseases like anthrax.

    c) Luis Pasteur studied about rabies and successfully developed the vaccine.

    d) The number of dogs with rabies increased rapidly in Paris.

19. The word "**frightening**" in line 21 means…

    a) amazing   b) exciting

    c) causing fear   d) worrying

20. What is the best title of the passage?

    a) Louis Pasteur: the Father of Bacteria

    b) Louise Pasteur: the Inventor of Vaccines

    c) Louise Pasteur: the Hero of France

    d) Louise Pasteur: Fighter of Disease.

****

2. Post-test

Instructions: Read the following passages and answer the questions that follow by choosing the best alternatives using the information in the passages.

Passage 1

The only members of the great apes that don't live in Africa live in Southeast Asian countries of Indonesia by the equator. The orangutan (pronounced "oh rang' oo tan") lives in the forests of two island countries called Borneo and Sumatra. **These island countries** are located between India and Australia. Orangutan is a Malayan word which
5   means "man of the woods." Most people know about these great apes from their lovable roles on TV and in movies.

The orangutan has rough, reddish-brown hair covering most of its body. The males also have reddish-blond beards and mustaches. A male is 3 to 5 feet (91 to 150 centimeters) tall and weighs an average of 165 pounds (about 75 kilograms). The
10   females average about 90 pounds (40 kilograms). Scientists have found fossil remains in China of giant orangutans that lived thousands of years ago. Both males and females have so long arms that they can reach their ankles when they stand up straight. Males can stretch their arms out to span an average of 7.5 feet (2.3 meters). Compare this to a person 5 feet tall only able to span 5 feet; then you can imagine how long orangutans'
15   arms really are. Since **they** spend so much time in the trees, their arms are very strong. All four of their "hands" have big toes like our thumbs to hold on very well.

Orangutans live most of their life in groups of two to five high up in the trees. They seldom come down to the ground. They use their long arms to climb and swing from tree to tree to eat fruit, leaves, and a few bird eggs. When they get thirsty they
20   find a hollow spot in a tree that has collected rainwater. They are **diurnal** creatures, meaning they are active in the daytime. They build a rough nest to sleep in at night about five or six stories above ground. They feel very safe and comfortable in their **lofty** home.

Although orangutans are huge, they are a quiet and peaceful creature. People of
25   Sumatra and Borneo have a legend that the "man of the woods" can speak, but he chooses not to do so because he is afraid that people will put him to work.

Orangutans really have no exact natural enemies other than humans. If human do not stop **deforestation**, that is, cutting down the forests, the orangutan will not have any habitat left. It is possible that this species of ape could become extinct because so

30 many females are killed in order to capture their babies for zoos. Scientists are trying to raise some orangutans in captivity to star in movies and supply zoos all over the world because people just love to watch these funny great apes perform tricks.

1). According to the passage we can say that orangutans …

    a) lived in China long ago

    b) are smarter than other kinds of apes

    c) are the tallest and largest apes

    d) eat meat

2). The phrase "**These island countries**" in line 3 refers to…

    a) Southeast Asian countries

    b) Sumatra Islands

    c) India and Australia

    d) Borneo and Sumatra Islands

3). The word "**they**" in line 14 refers to….

    a) humans

    b) male orangutans

    c) female orangutans

    d) male and female orangutans

4). What is the topic of Paragraph 2?

    a) Orangutans in China

    b) Physical features of orangutans

    c) Behaviors of orangutans

    d) Life on the tree of orangutans

5). The foods of orangutans are as the followings **except** ….

    a) fruits   b) eggs

    c) bird   d) leaves

6) The word "**diurnal**" in line 20 is closest to the meaning of….

    a) sleepy in the afternoon   b) alert during the afternoon

    c) sleepy at night   d) alert at night time

7) The word "**lofty**" in line 22 is closest to the meaning of….

    a) high   b) hanging

    c) floating   d) low

8). According to the last paragraph we can infer that

    a) The orangutan has a lot of enemies in the wild.

    b) We still do not know what the enemies of the orangutan are.

    c) The orangutan does not have natural enemies.

    d) Humans are the most dangerous enemy of orangutans.

9) What is **not true** about the orangutan?

    a) Some stories say that the orangutan can talk like human.

    b) The orangutan is huge and aggressive.

    c) The orangutan spends most of the time in the tree.

    d) The orangutan can use all of its feet to climb trees.

10) What is the best title of this passage?

    a) Man of the Woods   b) An Intelligent Ape

    c) Life of Orangutans in the Zoo   d) Orangutans in the World

****

Passage 2

[1]Most words in the English language have more than one simple, or basic, meaning. One example is the word diet. The most general definition of the noun is "a person's or group's usual food choices and habits." In a more specific definition, diet means "an eating plan with only certain kinds or amounts of food." For instance, a diet is often a plan to lose weight. Moreover, as a verb, diet means "go on diet."

[2]All over the world, the global diet includes fast food—prepared items from inexpensive restaurants, snack bars, or food stands. Some examples of typically American fast food are hamburgers, hot dogs, sandwiches, fried chicken, and so on. Some types of international fast foods might be German sausage and schnitzel, Italian pizza and pasta, Mexican tacos and burritos, Japanese sushi and tempura, Chinese eggrolls and noodles, and the like. The variety of fast foods available on the planet is growing. Even so, this kind of style of **nourishment** is becoming universal, or worldwide. Fast-food places usually prepare and serve the items quickly. Many are part of fast-food chains (eating places with the same name and company owner). KFC, the Pizza Company, and Pizza Hut are some examples. Restaurants under a fast-food chain usually have a similar atmosphere—the look of the place, menus, and the style and taste of food, for instance.

[3]For several reasons, many people choose fast food. First, it is quick and convenient. Second, it is cheaper than special home-cooked meals or formal restaurant dinners. Finally, it is **identical** in every eating place with the same company name. The atmosphere and style of most fast-food places is casual, comfortable, and familiar. So why do other eaters dislike or stay away from this fast, easy kind of nourishment? The main reason is its low nutritional value. Fast food doesn't contain large amounts of fibers, vitamins, minerals, and the like—elements necessary for good nutrition and health. In contrast, most types of fast food have a lot of fat, cholesterol, sugar, and salt in **them**. Possibly, these substances can cause or increase **health disorders**, like heart disease, strokes, and some kinds of cancer.

[4]Some people believe food should be perfectly fresh and natural. They view that fast food is not good for human beings. They don't think that **convenience foods** such

as canned, frozen, or packaged foods are nutritious either. In fact, these quick and easy kinds of foods are getting better and more healthful, however. Many fast food restaurants, for example, now have salad bars and put more vegetables items in their menus. In some places, veggieburgers are offered instead of hamburgers, and grilled chicken in place of fried. Also, some kinds of packaged fast-foods contain less fat, salt, and sugar. Moreover, some kinds of snacks like nutrition bars—snacks that contain a lot of protein, vitamins and minerals—are becoming widely available.

[5]Currently more people become more selective in eating, both at home or fast-food places. In general, more meals include the basic necessary food elements—protein, carbohydrates, and fats. The variety of food choices is large and increasing. The number of food preparation methods is growing too. Ways of cooking, eating habits, and food preferences all over the world are becoming more healthful. The global diet is changing in these and other ways.

11) What is **not true** about the passage?

    a) The quality of convenience foods is getting worse and worse.

    b) Some people choose to eat in fast-food places because they are cheaper.

    c) Some people believe that fast foods are not suitable for human beings.

    d) Important food elements include protein, carbohydrates and fats.

12) What is the topic of Paragraph 2?

    a) The danger of fast-foods all over the world.

    b) How fast food looks the same all over the world.

    c) The comparison of fast-foods around the world.

    d) How American hamburgers become famous.

13) According to Paragraph 4, which is not considered to be "convenience food"?

    a) Canned fish   b) Dried fruits

    c) Fresh oranges   d) Frozen chicken

14) Which of the following is closest to the meaning of the word "**identical**"

in line 20?

    a) different   b) similar   c) interesting   d) cheap

15) The term "**nourishment**" in line 12 refers to …..

    a) food elements   b) nutrition

    c) fast foods   d) international foods

16) The word "**them**" in Paragraph 3 refers to……

    a) home-made food   b) restaurant's dinner

    c) food elements   d) kinds of fast foods

17) Which of the following words is closest to meaning of the word "**health disorders**"

in Paragraph 3?

    a) heart problems   b) illnesses

    c) pains   d) weaknesses

18) What does the author think about fast foods?

    a) They are bad for health because they contain a lot of cholesterols and fat.

    b) They are being more and more popular than before because they are convenient, quick and easy to eat.

    c) They used to be less nutritious and less healthful, but now they are getting better and better.

    d) They are getting cheaper and cheaper because of sales reasons, but the quality is still the same.

19) According to Paragraph 4, we can infer that…

    a) Veggieburgers are more delicious than hamburgers.

    b) Convenience foods are not healthful.

    c) Grilled chicken are more healthful than fried chicken.

    d) All kinds of snack are too sweet and not nutritious.

20) What is the best title of the passage?

       a) Fast-food Chains around the World

       b) Fast food: Another Choice for Busy People

       c) The Changing Diet around the World

       d) More Production of Healthy Fast Food

****

APPENDIX E

The Results of Students' Pre- and Post-test Scores

The Results of the Students' Pre- and Post-tests Scores

Students	Pretest	Posttest	Difference
S1	9	11	2
S2	13	12	-1
S3	8	11	3
S4	6	8	2
S5	7	8	1
S6	10	11	1
S7	7	6	-1
S8	11	12	1
S9	9	10	1
S10	9	16	7
S11	11	17	6
S12	11	12	1
S13	9	13	4
S14	7	10	3
S15	13	13	0
S16	6	8	2
S17	12	14	2
S18	15	18	3
S19	13	18	5
S20	7	9	2
S21	15	16	1
S22	9	11	2
S23	12	10	-2
S24	12	11	-1
S25	13	16	3
S26	11	14	3
S27	11	9	-2
S28	12	17	5
S29	16	17	1
S30	7	15	8
S31	9	12	3
S32	15	17	2
S33	14	15	1
S34	14	10	-4

The Results of the Students' Pre- and Post-tests Scores (Continued)

Students	Pretest	Posttest	Difference
S35	13	18	5
S36	18	17	-1
S37	8	9	1
S38	5	9	4
S39	12	17	5
S40	6	9	3
S41	6	10	4
S42	13	16	3
S43	12	12	0
S44	8	6	-2
S45	12	16	4
S46	16	18	2
S47	13	13	0
S48	12	17	5
S49	12	12	0
S50	12	10	-2
S51	15	18	3
S52	8	11	3
S53	6	10	4
S54	7	10	3
S55	7	10	3
S56	8	13	5
S57	12	10	-2
S58	13	15	2
S59	13	15	2
S60	9	15	6
S61	11	17	6
S62	7	11	4
S63	9	9	0
S64	11	12	1
S65	13	15	2
S66	14	16	2
S67	14	15	1
S68	13	18	5
S69	17	15	-2
S70	5	8	3
S71	12	16	4
S72	8	11	3
S73	8	9	1

The Results of the Students' Pre- and Post-tests Scores (Continued)

Students	Pretest	Posttest	Difference
S74	9	9	0
S75	10	11	1
S76	13	14	1
S77	14	12	-2
S78	11	11	0
S79	14	16	2
S80	12	14	2
S81	11	16	5
S82	10	13	3
S83	8	12	4
S84	12	18	6
S85	8	10	2
S86	13	14	1
S87	8	13	5
S88	10	14	4
S89	13	16	3
S90	10	14	4
S91	7	11	4
S92	13	15	2
S93	14	16	2
S94	13	15	2
S95	14	17	3
Mean	11.41	12.16	0.747
N = 95	sig. = .000		

APPENDIX F

Evaluation Form of Wiki-based Collaborative Reading

(WCR) Instructional Model

Direction: Please read each item in the form below, and put a check mark (✓) in a

rating box that best describes your opinion ab out each statement.

5 = Strongly Agree

4 = Agree

3 = Uncertain

2 = Disagree

1 = Strongly Disagree

Item No.	Statement	Rating Scale				
		1	2	3	4	5
1.	Each component of the model is logically connected.					
2.	Each step of the model is clear and easy to understand.					
3.	The steps of the model are easy to implement.					
4.	Overall, the model is appropriate to be employed in teaching reading comprehension through collaborative learning on wikis.					
5.	In conclusion, the model is satisfactory.					

Other suggestions and comments:

....

....

....

....

....

....

Thank you very much

APPENDIX G

Questionnaire on the Participants' Opinion toward Wiki-based Collaborative Reading Lessons

1. English Version

This questionnaire aims to investigate students' satisfaction in taking English III Course through wiki-based collaborative reading instructional lessons (WCRI Lessons). It consists of two main parts:

Part I: Student's general information and experience in using wikis and collaborative learning

Part II: Student's satisfaction in WCRI lessons

Note: Your name and general information in this questionnaire will be maintained in strict confidentiality. Your responses in this questionnaire will not have any effects on your score and grade of English III Course.

_____

PART I: General Information and Experience in using Wikis

1. **Instructions:** Please fill in your information the blanks provided, and put a check (✓) in the box ☐ that is true to you.
2. **Name** _____   **Age** _____
3. **Gender** ☐ Male   ☐ Female
4. **Year of Study** ☐ 1st Year   ☐ 2nd Year   ☐ 3rd Year   ☐ 4th Year
5. **What is your major?** _____
6. **Previous Grades for English Courses at SUT:** English I _____ English II _____
7. **Do you know wikis?** ☐ Yes ☐ No

8. **Before taking this course, did you use to visit any wiki-based websites?**
    ☐ Yes ☐ No

9. **If "Yes", please specify the name(s) or wiki-based website(s)**

    Part II: Satisfaction in wiki-based collaborative reading instructional lessons (WCRI Lessons)

    Instructions: Please read each of the following statements carefully, and put a check (✓) in the rating box that describes your opinion best.

Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
A. Your satisfaction on collaborative learning on WCRI Lessons					
1. The WCRI lessons motivate me to work with my team in carrying out online assignments.					
2. The WCRI lessons encourage me to share my opinions and comments with my team mates.					
3. The WCRI lessons help me to better express my opinions and feelings in English during group discussion.					
4. The WCRI lessons enable me to assess the progress of my group work.					

Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5. I feel less nervous using English with my classmates when doing assignment on the WCRI lessons.					
6. The learning objectives of the lessons in the WCRI lessons have been well-described.					
7. The WCRI lessons helps me to share and acquire ideas with my teammates.					
8. I don't think that the WCRI lessons promote discussions.					
9. Activities in the WCRI lessons cause conflicts among my team mates.					
10. Students in the group do not make much contribution for the group in doing online activities.					
11. Collaboration on website promoted responsibility among my group members.					

Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
12. The instructions of the activities in WCRI Lessons are clear.					
13. The activities in the WCRI lessons promote collaboration among teammates.					
B. Your satisfaction on the technicality of the WCRI website					
14. The contents in WCRI lessons are appropriate with my English language proficiency.					
15. I don't have difficulties with posting my comments and opinions on WCRI lessons.					
16. The WCRI lessons is user-friendly.					
17. I don't find it difficult to participate in learning activities on the WCRI lessons.					

Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
C. The Impact WCRI Lessons on your English language and reading comprehension					
18. The WCRI lessons help me improve my reading comprehension.					
19. Activities in the WCRI lessons help me understand the main ideas of the texts I read.					
20. The lessons and activities in WCRI lessons increase my motivation to read English passages.					
21. The WCRI lessons promote the use of reading strategies					
22. The lessons and activities in the WCRI lessons help improve my English reading comprehension skills.					

23. Please express other opinions or suggestions in learning through wiki-based collaborative reading instructional lessons (WCRI Lessons).

……………………………………………………………………………………………
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Thank you very much for your kind cooperation

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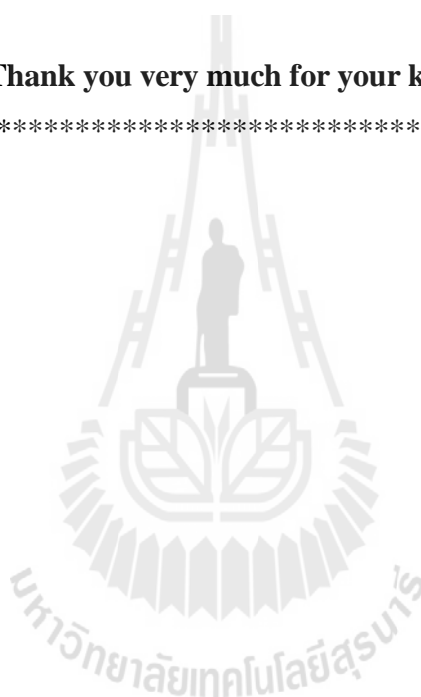
2. Thai Version

แบบสอบถามความพึงพอใจของนักศึกษาในการเรียนภาษาอังกฤษผ่านหน่วยการเรียนการสอน

ทักษะการอ่านแบบร่วมมือกันบนวิกิ

คำชี้แจง   แบบสอบถามชุดนี้มีจัดทำขึ้นเพื่อศึกษาความพึงพอใจของนักศึกษามหาวิทยาลัยเทคโนโลยีสุรนารีกลุ่มที่
ลง ทะเบียนในรายวิชาภาษาอังกฤษ 3 (203203) ซึ่งเรียนผ่านหน่วยการเรียนการสอนทักษะการอ่านแบบร่วมมือกัน
บนวิกิ โดยแบบสอบถามชุดนี้แบ่งออกเป็น 2 ส่วนคือ

> **ส่วนที่ 1:** ข้อมูลทั่วไปของนักศึกษาและประสบการณ์ในการใช้หรือเข้าชมเว็บไซต์วิกิและด้านการเรียน
> แบบร่วมมือกัน
>
> **ส่วนที่ 2:** ความพึงพอใจของนักศึกษาในการเรียนผ่านหน่วยการเรียนการสอนทักษะการอ่านแบบ
> ร่วมมือกันบนวิกิ

หมายเหตุ: ชื่อ นามสกุล และข้อมูลส่วนตัวของนักศึกษาที่ระบุไว้ในแบบสอบถามชุดนี้จะถูกเก็บไว้เป็นความลับ
อย่างดีที่สุด   คำตอบหรือความคิดเห็นใดๆของนักศึกษาที่ระบุไว้ในแบบสอบถามชุดนี้จะไม่ส่งผล
กระทบต่อคะแนนหรือผลการเรียนใดๆของนักศึกษา

****

ส่วนที่ 1   ข้อมูลทั่วไปของนักศึกษาและประสบการณ์ในการใช้หรือเข้าชมเว็บไซต์วิกิและด้านการเรียนแบบ
ร่วมมือกัน

คำแนะนำในการทำแบบสอบถาม: กรุณาทำเครื่องหมายถูก (✓) ในช่องข้อมูล ☐ ที่ตรงกับตัวนักศึกษาหรือกรอก
ข้อความในช่องว่างที่กำหนดให้

ชื่อ-นามสกุล _____   อายุ _____

เพศ ☐ ชาย   ☐ หญิง   สาขา _____

ชั้นปี _____

ระดับผลการเรียนในรายวิชาภาษาอังกฤษที่ผ่านมา **: English I _____   English II _____**

ก่อนที่จะเข้าร่วมเรียนในรายวิชานี้นักศึกษารู้จักวิธีการเรียนรู้แบบร่วมมือกันหรือไม่ ☐ รู้จัก ☐ ไม่รู้จัก

นักศึกษารู้จักวิกิหรือไม่ ☐ รู้จัก (กรุณาทำข้อต่อไป)   ☐ ไม่รู้จัก (กรุณาข้ามไปยังส่วนที่ 2)

กรุณาระบุเว็บไซต์วิกิที่นักศึกษาเคยเข้า ....

....

....

ส่วนที่ 2: ความพึงพอใจของนักศึกษาในการเรียนผ่านหน่วยการเรียนการสอนทักษะการอ่านแบบร่วมมือกันบนวิกิ

คำชี้แจง: กรุณาทำเครื่องหมาย (✓) ลงในช่องว่างที่ตรงกับความพึงพอใจของท่านเพียงช่องเดียว ในแต่ละ
ข้อความ โดยมีระดับความพึงพอใจ 5 ระดับดังต่อไปนี้

        5   หมายถึง พึงพอใจมากที่สุด

        4   หมายถึง พึงพอใจ

        3   หมายถึง พึงพอใจปานกลาง

        2   หมายถึง พึงพอใจน้อย

        1   หมายถึง พึงพอใจน้อยที่สุด

ข้อความ	ระดับความพึงพอใจ				
	5	**4**	**3**	**2**	**1**
ก. ระดับความพึงพอใจในการเรียนรู้แบบการสอนทักษะการอ่านแบบร่วมมือกันบนวิกิ					
1. หน่วยการเรียนบนวิกินั้นสร้างแรงจูงใจให้ข้าพเจ้าทำงานที่ได้รับมอบหมายกับเพื่อนรวมทีมทางอินเตอร์เน็ตให้ลุล่วงได้					
2. หน่วยการเรียนบนวิกิเปิดโอกาสให้ข้าพเจ้าสามารถแสดงความคิดเห็นและคำวิจารณ์กับเพื่อนร่วมทีมได้					
3. การทำงานบนหน่วยการเรียนบนวิกิช่วยให้ข้าพเจ้ามีความกล้าที่จะแสดงความคิดเห็นและความรู้สึกต่างๆในการทำงานได้มากขึ้น					
4. หน่วยการเรียนบนวิกิช่วยให้ข้าพเจ้าสามารถตรวจสอบความคืบหน้าของงานกลุ่มตัวเองได้					
5. ข้าพเจ้ารู้สึกมีความกดดันน้อยลงเวลาที่ทำงานที่ได้รับมอบหมายกับเพื่อนร่วมทีมบนวิกิ					

ข้อความ	ระดับความพึงพอใจ				
	5	4	3	2	1
6. หน่วยการเรียนบนวิกิมีการอธิบาย วัตถุประสงค์ในการเรียนที่ชัดเจน					
7. หน่วยการเรียนบนวิกิช่วยให้ข้าพเจ้ากล้าที่ จะแลกเปลี่ยนและรับฟังความคิดเห็นของ เพื่อนร่วมทีม					
8. ข้าพเจ้าคิดว่ากิจกรรมในหน่วยการเรียนบน วิกินั้น**ไม่ช่วย**ให้เกิดการอภิปรายร่วมกัน ระหว่างเพื่อนร่วมทีม					
9. กิจกรรมต่างๆในหน่วยการเรียนบน วิกิมัก ก่อให้เกิดความขัดแย้งกันระหว่างเพื่อนร่วม ทีม					
10. สมาชิกในกลุ่มไม่มีความกระตือรือร้นที่ จะมีส่วนร่วมในการทำงานกลุ่มในหน่วย การเรียนบนวิกิ					
11. การทำงานแบบร่วมมือกันในหน่วยการ เรียนบนวิกิส่งเสริมให้สมาชิกในกลุ่มมี ความรับผิดชอบในหน้าที่ตัวเอง					
12. กิจกรรมในหน่วยการเรียนบนวิกิ ได้มี คำอธิบายที่เข้าใจ ทำให้ข้าพเจ้ารู้ว่าจะต้อง ทำอะไร ในกิจกรรมนั้นๆ					
13. กิจกรรมต่างๆในหน่วยการเรียนบน วิกิ ช่วยทำให้สมาชิกในกลุ่มมีความสามัคคีใน การทำงาน					
ข. ระดับความพึงพอใจในระบบของเว็บไซต์วิกิ					
14. เนื้อหาของหน่วยการเรียนบนวิกิมีความ เหมาะสมกับระดับความสามารถในการใช้ ภาษาอังกฤษของข้าพเจ้า					

ข้อความ	ระดับความพึงพอใจ				
	5	4	3	2	1
15. ข้าพเจ้าสามารถโพสต์ข้อความหรือความคิดเห็นในหน่วยการเรียนบนวิกิได้โดยง่าย ปราศจากความยุ่งยาก					
16. การทำกิจกรรมในหน่วยการเรียนบนวิกินั้นสามารถทำได้ง่ายไม่ซับซ้อน					
17. ข้าพเจ้าคิดว่าการเข้าร่วมกิจกรรมต่างๆในหน่วยการเรียนบนวิกิมีความสะดวก ไม่ซับซ้อน					
ค. ผลของบทเรียนและกิจกรรมการการเรียนผ่านหน่วยการเรียนการสอนทักษะการอ่านแบบร่วมมือกันบนวิกิ					
18. กิจกรรมกิจกรรมต่างๆในหน่วยการเรียนบนวิกิส่งเสริมให้ข้าพเจ้ามีความอยากที่จะอ่านบทความภาษาอังกฤษมากขึ้น					
19. บทเรียนและ กิจกรรมในหน่วยการเรียนบนวิกินั้นช่วยให้ข้าพเจ้าสามารถหาใจความสำคัญของย่อหน้าได้					
20. หน่วยการเรียนบนวิกิช่วยให้ข้าพเจ้าพัฒนาทักษะด้านการอ่าน					
21. หน่วยการเรียนบนวิกิส่งเสริมให้ข้าพเจ้าใช้กลยุทธ์ในการอ่านที่ข้าพเจ้าได้เรียนมา					
22. ข้าพเจ้าคิดว่าบทเรียนและกิจ กรรม ต่างๆในหน่วยการเรียนบนวิกินั้นช่วยพัฒนาทักษะการอ่าน					

23.

กรุณาระบุความคิดเห็น ความรู้สึก หรือข้อแนะนำของนักศึกษาที่มีต่อการเรียนภาษาอังกฤษผ่านหน่วยการเรียนการสอนทักษะการอ่านแบบร่วมมือกันบนวิกิ

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☺☺☺☺ ขอบคุณนักศึกษาเป็นอย่างยิ่งที่ให้ความร่วมมือ ☺☺☺☺

APPENDIX H

Interview Guided Questions

1. (English Version)

1. Did you learn about reading strategies before this course?

2. Before this course, what did you usually do when you did English reading comprehension tests? Did you use any reading strategies?

3. Have you had group discussion in you English class before? If so, how much English do you use?

4. How much English do you use in discussing with your teammates while doing the online tasks in WCR lessons in comparison with at school?

5. What do you think of WCR lessons and collaborative reading in comparison with normal reading classroom in which only the teacher takes control of the class?

6. Do you use reading strategies learned in WCR lessons when you discuss with your group members while reading the passages?

7. What do you think are strong points and weak points of WCR lessons?

8. Which kind of reading, between reading alone and reading in a team with other students, that you think can help you understand reading passages in English more? Why?

9. Do WCRI lessons change the way you used to read in English? How?

10. Do you have any suggestions regarding WCRI lessons?

2. (Thai Version)

1. นักศึกษาเคยเรียนเกี่ยวกับกลยุทธ์ในการอ่านภาษาอังกฤษมาก่อนลงเรียนวิชานี้หรือ
   เปล่า

2. ก่อนที่จะมาเรียนวิชานี้ ปกติแล้วนักศึกษาได้ใช้กลวิธีอะไรในการทำข้อสอบการอ่าน
   เพื่อนความเข้าใจเป็นภาษาอังกฤษ ได้ใช้กลยุทธ์ทางการอ่านอะไรหรือไม่

3. นักศึกษาเคยอภิปรายกับเพื่อนเป็นกลุ่มเป็นภาษาอังกฤษมาก่อนหรือไม่ แล้วใช้
   ภาษาอังกฤษในการอภิปรายมากแค่ไหน

4. นักศึกษามีความคิดเห็นอย่างไรกับบทเรียนบนวิกิและการเรียนรู้แบบร่วมมือกันเมื่อ
   เทียบกับการเรียนทักษะการอ่านในชั้นเรียนทั่วไปที่มีอาจารย์เป็นคนจัดการกิจกรรม
   ต่างๆในชั้นเรียนเพียงผู้เดียว

5. ในการอภิปรายกับกลุ่มเพื่อนช่วยกันอ่านบทความภาษาอังกฤษ นักศึกษาได้ใช้กลยุทธ์
   ในการอ่านที่ได้เรียนจากบทเรียนในวิกิหรือไม่

6. กลยุทธ์ในการอ่านช่วงไหน ก่อนอ่าน (ทำนายเนื้อเรื่อง การใช้ความรู้ภูมิหลัง)
   การเดาคำศัพท์จา) ระหว่างอ่านกบริบท การหาใจความสำคัญ การ) หรือหลังจากอ่าน (
   ที่นักศึกษาคิดว่ามีประโยชน์ (สรุป การสร้างคำถามที่เราอยากรู้ต่อยอดจากการอ่าน
   มากที่สุด ช่วยให้เกิดความเข้าใจในการอ่านมากที่สุด อย่างไร

7. นักศึกษาคิดว่าอะไรเป็นจุดเด่นและจุดด้อยของบทเรียนทักษะการอ่านแบบร่วมมือกัน
   บนวิกิ

8. นักศึกษาคิดว่าการอ่านแบบไหน ระหว่างการอ่านคนเดียวและการช่วยกันอ่านกับ
   เพื่อนๆเป็นกลุ่มที่จะช่วยให้นักศึกษามีความเข้าใจในการอ่านเป็นภาษาอังกฤษมากกว่า
   กัน เพราะอะไร

9. นักศึกษาคิดว่าบทเรียนการอ่านบนวิกิได้เปลี่ยนวิธีการอ่านภาษาอังกฤษแบบเดิมๆที่
   นักศึกษาเคยทำหรือไม่ อย่างไร

10. นักศึกษามีข้อแนะนำอะไรเพิ่มเติมในส่วนของบทเรียนและกิจกรรมการอ่านบนวิกิ
    หรือไม่

APPENDIX I

List of Experts

Name	Position	Instrument Examined
Prof. Dr. Chaiyong Brahmawong	• Senior Professor, Vice President for Ubiquitous Education, International Borderless Education College, Bangkokthonburi University, Thailand	• WCR Instructional Model • The questionnaire on the participants' opinions toward WCR lessons
Dr. Peerasak Siriyothin	• Dean of Institute of Social Technology, Suranaree University of Technology, Thailand • A lecturer, Suranaree University of Technology	• WCR Instructional Model • The questionnaire on the participants' opinions toward WCR lessons • The interview guided questions
Dr. Suksan Supasetseree	• Unit Supervisor of the Foreign Languages Resource Unit (FLRU), Suranaree University of Technology • A lecturer in the School of Foreign Languages, Suranaree University of Technology	• WCR Instructional Model • The questionnaire on the participants' opinions toward WCR lessons • The interview guided questions • Contents of the pre- and posttests • WCR lesson plan
Dr. Dhirawit Pinyonatthagarn	• A lecturer in the School of Foreign Languages, Suranaree University of Technology	• The questionnaire on the participants' opinions toward WCR lessons • The interview guided questions
Dr. Wannapa Trakulkasemsuk	A lecturer, King Mongkut's University of Technology Thonburi	• Transcribed students' discussion in WCR lessons

CURRICULUM VITAE

Mr. Suparat Walakanon was born on January 21, 1978 in Chiang Mai. He recieved a Bachelor of Industrial Education in Electrical Engineering from King Mogkut's University of Technology in 2003. In the same year, he continued his study in Masters of Arts in English Language Teaching at the same University. He achieved his Master's Degree in 2006. His research interest covers the areas of technology-enhanced language learning, e-learning, and instructional system design.