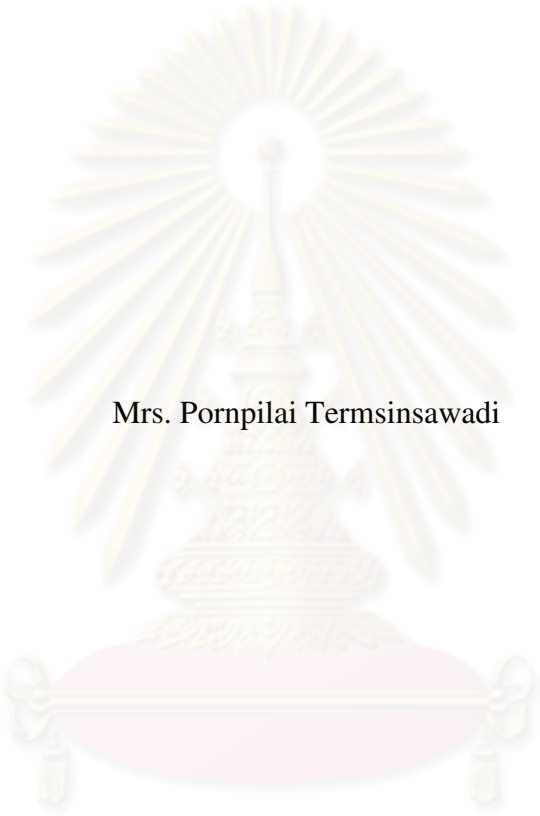
การพัฒนาบทเรียนเว็บเควสเพื่อเสริมสร้างความสามารถในการอ่านและการเขียนภาษาอังกฤษและการมีส่วนร่วมในการเรียนของนักศึกษาระดับปริญญาตรี สาขาวิศวกรรมศาสตร์ มหาวิทยาลัยเทคโนโลยีราชมงคลพระนคร วิทยาเขตพระนครเหนือ

นางพรพิไล เติมสินสวัสดิ์

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรดุษฎีบัณฑิต
สาขาวิชาภาษาอังกฤษเป็นภาษานานาชาติ (สหสาขาวิชา)
บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2552

A DEVELOPMENT OF WEBQUEST MODULES TO ENHANCE ENGLISH READING AND WRITING ABILITIES AND LEARNING ENGAGEMENT OF UNDERGRADUATE ENGINEERING STUDENTS AT RAJAMANGALA UNIVERSITY OF TECHNOLOGY PHRA NAKHON, NORTH BANGKOK CAMPUS

Mrs. Pornpilai Termsinsawadi



A Dissertation Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy Program in English as an International Language
(Interdisciplinary Program)
Graduate School
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Thesis Title	A DEVELOPMENT OF WEBQUEST MODULES TO ENHANCE ENGLISH READING AND WRITING ABILITIES AND LEARNING ENGAGEMENT OF UNDERGRADUATE ENGINEERING STUDENTS AT RAJAMANGALA UNIVERSITY OF TECHNOLOGY PHRA NAKHON, NORTH BANGKOK CAMPUS
By	Mrs. Pornpilai Termsinsawadi
Field of Study	English as an International Language
Thesis Advisor	Associate Professor Punchalee Wasanasomsithi, Ph.D.

Accepted by the Graduate School, Chulalongkorn University in Partial Fulfillment of the Requirements for the Doctoral Degree

.....Dean of the Graduate School
(Associate Professor Pornpote Piumsomboon, Ph.D.)

THESIS COMMITTEE

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(Associate Professor Supanee Chinnawongs, Ph.D.)

.....Thesis Advisor
(Associate Professor Punchalee Wasanasomsithi, Ph.D.)

..... Examiner
(Associate Professor Suphat Sukamolson, Ph.D.)

..... Examiner
(Assistant Professor Chansongklod Gajaseni, Ph.D.)

..... External Examiner
(Assistant Professor Saksit Saengboon, Ph.D.)

พรพิไล เติมสินสวัสดิ์ : การพัฒนาบทเรียนเว็บเควสเพื่อเสริมสร้างความสามารถในการอ่านและการเขียนภาษาอังกฤษและการมีส่วนร่วมในการเรียนของนักศึกษาระดับปริญญาตรี สาขาวิศวกรรมศาสตร์ มหาวิทยาลัยเทคโนโลยีราชมงคลพระนคร วิทยาเขตพระนครเหนือ.
(A DEVELOPMENT OF WEBQUEST MODULES TO ENHANCE ENGLISH READING AND WRITING ABILITIES AND LEARNING ENGAGEMENT OF UNDERGRADUATE ENGINEERING STUDENTS AT RAJAMANGALA UNIVERSITY OF TECHNOLOGY PHRA NAKHON, NORTH BANGKOK CAMPUS) อ.ที่ปรึกษาวิทยานิพนธ์หลัก : รศ. ดร. ปัญชลี วาสนสมสิทธิ์, 204 หน้า.

งานวิจัยนี้ทำขึ้นโดยมีวัตถุประสงค์สี่ประการคือ (1) เพื่อพัฒนาบทเรียนเว็บเควสสำหรับวิชาภาษาอังกฤษเทคนิคเพื่อพัฒนาความสามารถในการอ่านและการเขียนภาษาอังกฤษของนักศึกษา (2) เพื่อศึกษาผลของบทเรียนเว็บเควสที่มีต่อการพัฒนาความสามารถในการอ่านและการเขียนภาษาอังกฤษของนักศึกษา (3) เพื่อสำรวจระดับการมีส่วนร่วมในกิจกรรมการเรียนการสอนของนักศึกษาที่มีต่อการสอนภาษาอังกฤษโดยใช้บทเรียนเว็บเควสและ (4) เพื่อสำรวจความคิดเห็นและเจตคติของนักศึกษาที่มีต่อการสอนภาษาอังกฤษโดยใช้บทเรียนเว็บเควสที่ได้พัฒนาขึ้น กลุ่มตัวอย่างในงานวิจัยนี้เป็นนักศึกษาปริญญาตรีชั้นปีที่ 2 คณะวิศวกรรมศาสตร์ จำนวน 40 คนซึ่งได้ลงทะเบียนเรียนวิชา Technical English ในภาคการศึกษาที่หนึ่ง ปีการศึกษา 2552 ที่มหาวิทยาลัยเทคโนโลยีราชมงคลพระนคร พระนครเหนือ การทดลองใช้เวลา 14 สัปดาห์ การเก็บข้อมูลได้ดำเนินการโดยการใช้ข้อสอบวัดผลสัมฤทธิ์ในการประเมินความสามารถในการอ่านและการเขียนภาษาอังกฤษก่อนและหลังการทดลองโดยนำผลคะแนนของนักศึกษาที่ได้จากการสอบก่อนและหลังการทดลองมาเปรียบเทียบโดยใช้ paired sample t-test และ Hedges' g effect size เพื่อวัดความแตกต่างของผลคะแนนและขนาดของความต่างที่เกิดขึ้นก่อนและหลังการสอนโดยใช้บทเรียนเว็บเควสที่พัฒนาขึ้น หลังการทดลองได้มีการใช้แบบสอบถามเพื่อสำรวจระดับการมีส่วนร่วมในกิจกรรมการเรียนของนักศึกษาทั้งด้านพฤติกรรมการเรียน ด้านเจตคติและด้านกระบวนการคิด นอกจากนี้ระหว่างการทดลองยังใช้แบบบันทึกการเรียนการสอนของนักศึกษาและบันทึกของครูในการเก็บข้อมูลเชิงคุณภาพเกี่ยวกับการมีส่วนร่วมในกิจกรรมการเรียนและเจตคติของนักศึกษาที่มีต่อการสอนภาษาอังกฤษแบบนี้ และยังได้สำรวจความคิดเห็นและทัศนคติของนักศึกษาที่มีต่อรูปแบบการสอนภาษาอังกฤษดังกล่าวโดยใช้การสัมภาษณ์หลังการทดลอง

ผลการวิจัยพบว่าผลคะแนนการอ่านและการเขียนภาษาอังกฤษก่อนและหลังการทดลองมีความแตกต่างอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 เมื่อคำนวณขนาดของความต่างโดยใช้ Hedges' g effect size ปรากฏว่าได้ค่าขนาดความต่างเท่ากับ 1.19 และ 2.17 ตามลำดับ ซึ่งถือว่าเป็นขนาดความต่างในระดับมาก และเมื่อพิจารณาจากคำตอบของนักศึกษาในแบบสอบถามสำรวจการมีส่วนร่วมในกิจกรรมการเรียนนั้นพบว่าระดับการมีส่วนร่วมในกิจกรรมของนักศึกษาทั้งด้านพฤติกรรมการเรียน ด้านเจตคติและด้านกระบวนการความคิด อยู่ในระดับสูง นอกจากนี้ผลการวิเคราะห์แบบบันทึกการเรียนและการสัมภาษณ์แสดงให้เห็นถึงความคิดเห็นของนักศึกษาที่มีต่อการเรียนการสอนที่ใช้เว็บเควสโมดูลว่าเป็นประโยชน์ต่อการพัฒนาทักษะด้านการอ่านและการเขียนภาษาอังกฤษ และพบว่านักศึกษาส่วนใหญ่มีเจตคติที่ดีต่อรูปแบบการเรียนการสอนแบบนี้

สาขาวิชา ภาษาอังกฤษเป็นภาษานานาชาติ ลายมือชื่อนิสิต .....

ปีการศึกษา 2552 ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก.....

4889664320: MAJOR ENGLISH AS AN INTERNATIONAL LANGUAGE
KEYWORDS:WEBQUEST MODULES /STUDENT ENGAGEMENT/ CONSTRUCTIVISM / COOPERATIVE LEARNING/ READING ABILITY/WRITING ABILITY / STUDENTS' PERCEPTIONS

PORNPILAI TERMSINSAWADI: A DEVELOPMENT OF WEBQUEST MODULES TO ENHANCE ENGLISH READING AND WRITING ABILITIES AND LEARNING ENGAGEMENT OF UNDERGRADUATE ENGINEERING STUDENTS AT RAJAMANGALA UNIVERSITY OF TECHNOLOGY PHRA NAKHON, NORTH BANGKOK CAMPUS. THESIS ADVISOR: ASSOC. PROF. PUNCHALEE WASANASOMSITHI, Ph.D., 204 pp.

The research study was aimed at fulfilling four objectives: (1) to develop the WebQuest modules for "Technical English" course for enhancing students' English reading and writing abilities, (2) to investigate the effect of the integration of the developed WebQuest modules on reading and writing abilities of undergraduate engineering students, (3) to examine the effect of the integration of developed WebQuest in enhancing student engagement, (4) to examine the students' perceptions of the developed WebQuest modules. The study was conducted with a sample group of 40 undergraduate engineering students who were enrolled in the "Technical English" course in the first semester of the academic year 2008 at Rajamangala University of Technology Phra Nakhon, North Bangkok. The experiment was carried out for 14 weeks. Data were collected using the reading and writing achievement tests administered before and after the implementation of the developed WebQuest modules. The gained scores obtained from the pretests and the posttests were compared using paired sample t-test and Hedges' g effect sizes to measure the effects and the magnitudes of the effects caused by the developed WebQuest modules. In addition, a self-rating engagement questionnaire was distributed to the participants at the end of the course to investigate student learning engagement. Students' logs and teacher's diary were also employed during the implementation to collect qualitative data concerning students' perceptions of the WebQuest modules. A semi-structured interview was an additional means to investigate students' perceptions of the developed modules.

Findings revealed that there was a statistically significant difference between the mean scores students obtained from the pretests and posttests of reading and writing achievement at a significance level of 0.05. The effect sizes calculated by using Hedges' g yielded the value of 1.19 and 2.17, respectively, which were considered large. The data obtained from the self-rating engagement questionnaire indicated that the level of the students' behavioral, affective and cognitive engagement was high when studying with the WebQuest modules. According to the qualitative data obtained from the students' logs and teacher's diary, the students revealed that the WebQuest modules were useful for enhancing their reading and writing abilities and the majority had positive perceptions of the implementation of these instructional modules.

Field of Study: English as an International Language Student's Signature Pornpilai Termsinsawadi

Academic Year: 2009 Advisor's Signature Punchalee Wasanasomsithi

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My sincerest gratitude goes to my thesis advisor, Assoc. Prof. Dr. Punchalee Wasanasomsithi, for her constant encouragement, guidance, assistance and all kindest support during my doctoral work. I am deeply grateful to the research committee members: Assoc. Prof. Dr. Supanee Chinnawongs, Assoc. Prof. Dr. Suphat Sukamolson, Assist. Prof. Dr. Chansongklod Gajaseni, and Assist. Prof. Dr. Saksit Saengboon.

I would especially like to express my appreciation to many professors who kindly helped in validating the research instruments. I do owe more than thanks to all of my teachers and friends in the EIL program. In addition, I am grateful for my colleagues at Rajamangala University of Technology Phra Nakhon, especially Ajarn Suangkanok Piboonthamnont for her encouragement and support. My thanks are extended to all of my students who participated in this study.

Last but not least, I would like to dedicate this dissertation to the most important persons in my life: my beloved mom and dad. Without them, the success of my study would not have been possible. Therefore, this achievement is dedicated to both of them.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Nowadays Information and Communication Technology (ICT) plays an important role in most aspects of our lives including in educational fields. A wide range of information can be surfed from the Internet and the World Wide Web, and Internet resources have been widely used as an essential tool to facilitate learning. As the world educational scenarios have changed because of the potentials of technologies to enhance teaching and learning, the integration of ICT into classroom practice is so important that it has become a priority in national educational policies worldwide, such as the policy for ICT in education in England, the USA, Canada and Australia (Fluck, 2001), as well as in Thailand.

Between 2005 and 2008, the policy of the Thai Government emphasizes the utilization of ICT to promote education, especially the enhancement of teaching and learning processes (Artidtieng, 2005). Apart from the use of ICT, the educational reform in Thailand, enforced by the National Education Act in 1999, also involves curricula and learning processes based on the principles of organizing teaching/learning processes that require systematic thinking and actual practice rather than rote learning, with an aim to enable learners to analyze, synthesize, and build a core of knowledge that will form the basis for learning in the future world. The importance of ICT learning processes is clearly stated in the Educational Reform Act B.E. 2542 (Office of the Prime Minister, 1999).

Teachers nowadays have to face the hard time of adjusting themselves to the ever-expanding role of ICT. According to the educational reform, it is not the question of asking whether technology should be used in education or not, but, rather, educators or teachers must ask themselves how technology can be effectively used to help students improve their learning as well as to alter classroom practice as a result of introducing technology into the curriculum.

At Rajamangala University of Technology Phra Nakhon (RMUTP), one of the major educational policies is the use of computer-based learning and e-learning.

The university spends a large amount of budget on educational technology each year and puts a lot of efforts to have the technological innovative teaching and learning systems and to expand the existing e-learning projects. Teachers are expected to make a full use of the modern technology to increase the quality of teaching and learning. Therefore, RMUTP teachers have an urgent need to incorporate the instructional use of computer technologies into their class activities.

The situation at the English department of RMUTP is quite unique in the way that English teachers in each campus are responsible for finding their own ways to develop teaching materials used in their classroom based on the core course syllabus. They have to study the course objectives and course descriptions in order to develop their own teaching materials. By doing this, different campus teachers employ different teaching materials for the same English course. Most of the textbooks and teaching materials currently in use are based on traditional instruction focusing on particular linguistic features and a lot of drills and practice exercises. The situation is more complicated when it comes to dealing with the technological advancement. This is because to integrate making technology in the classroom instruction and make it work is not a simple task, and not all teachers possess the skills required to deal with technology-based lessons. Due to this urgent need to bring in the technological innovative teaching and learning and the learner-centered instruction into classroom settings, the new course materials have to be developed to achieve these goals.

According to the change of the technology-enhanced course materials, both the lives of teachers and students will be changed as well. Students will become more active learners dealing with new experience of processing knowledge and developing collaborative learning skills. Teachers, on the other hand, will change their roles from those of the ‘director’ or ‘instructor’ to ‘facilitator’ and ‘manager’ of the students’ learning processes. In other words, the role of the teacher will be changed to that of a learning facilitator who provides the rich learning environment for the learner-centeredness to take place. Teachers also need to introduce, prepare, and lead students to the idea of learner-centered education. Therefore, this will be a challenging situation for both teachers and students alike.

In conclusion, there are a number of reasons why existing courses at RMUTP which is based on traditional teacher-centered instruction have to be reconsidered, reevaluated, and renewed. First, there is an urgent need to incorporate technology into the curriculum—not only the issue of using computer technology in teaching but also using it to create effectiveness in language instruction. Second, there is a shift from traditional instruction which is based on rote learning to more learner-centered and interactive learning environment. Put another way, RMUTP tries to seek ways to help increase student participation in classroom as it is believed that it is about time that the students' concept of learning be changed. As Adams & Brindley (2007) point out, the role of ICT in the curriculum is much more than merely a passing trend and that it should make teachers rethink about pedagogical issues alongside the approaches to learning that students need to apply in classrooms.

In order to effectively deal with the above concerns, pedagogical research-based information is required to determine whether the implementation of the innovative technology can actually enhance student learning. An extensive review of literature has revealed that one of the latest developments in educational technology is the use of WebQuests (Shiratuddin, 2001).

WebQuests were originally developed in 1995 by Dr. Bernie Dodge of San Diego State University (Lamb & Teclehaimanot, 2005). Dodge defines WebQuests as "inquiry-oriented activities in which some or all the information that learners interact with comes from resources on the Internet" (Dodge, 1995: 1). A WebQuest focuses on a particular problem. It requires learners to help one another work out the problem by making use of authentic materials from the Internet which are related to their academic discipline. In doing so, it is structured to provide learners with scaffolding and support that direct them to reliable and appropriate websites.

The principles underlying WebQuests are those of constructivism which is the current trend for English language learning (March, 1998; Marco, 2002). Simply put, knowledge is constructed by relating what is encountered to what is already known. Thus, students are active participants in the learning process. Another basic tenet found in the constructivist theory of learning is scaffolding which is one of the major components of WebQuests. This scaffolding can be in the forms of resource

links or guidance for specific skills; thus, the Internet becomes a tool that facilitates information exploration and knowledge construction.

The popularity and usefulness of WebQuests have been claimed by a large number of scholars and educators. For example, Bitter & Legacy (2006: 130) point out that "one recently accepted and systematized form of online instruction is the WebQuest." Likewise, Murray & McPherson (2004) state that WebQuests are now widely used in diverse educational contexts and curriculum areas. One explanation for such claim can be found in Marco (2002) who mentions that the use of WebQuests is very popular and is considered as a useful tool to fully exploit the resources on the Internet for good language learning practice. Marco also notes that WebQuests are particularly suitable for ESP language learning in the way that the students perform a real world task using authentic materials related to their academic discipline.

There are a number of reasons that support the popularity and usefulness of the WebQuests. First, WebQuests foster cooperative learning. Since WebQuests are concerned with complex tasks or problems, students have to cooperate and take on specific roles within a cooperative group in order to complete the tasks or solve the problems. Second, WebQuests are authentic. According to Davis (2003), WebQuest tasks concern real world problems that students have to solve in their everyday life. Such real world problems are authentic, meaningful, and engaging problems that give students opportunities for authentic communication through engagement with real tasks. Third, WebQuests are motivating to students because they can combine student enthusiasm with technology with real world experiences that transfer beyond school setting (Watson, 1999 as cited in Lamb & Teclehaimanot, 2005). Fourth, WebQuests provide a new instructional opportunity for developing academic literacy skills (Peterson et al., 2003). When completing a WebQuest task, students are engaged in the web-based reading. This helps them develop critical reading and synthesizing skills. WebQuests also promote writing with a purpose for a real world audience (Marco, 2002).

Despite the popularity and usefulness of the WebQuests claimed by many scholars, research that yields direct support to the use of WebQuests to increase students' language achievement is still limited (Abbitt & Ophus, 2008). Abbitt &

Ophus examined the body of research investigating the impacts of WebQuest on teaching and learning. It was found out that, by searching for all published articles, theses, dissertations and conference proceedings relating to the implementation of the WebQuest strategy at all levels of education from the sources in ERIC database, EBSCO Academic Search Premier and Educational Research Complete databases, the Education and Information Technology (ED/IT) digital library, the Ohio Library and Information Network (OhioLINK), as well as the GOOGLE search engine, there were 108 published sources relating to WebQuest. Out of these 108 references, only 41 articles were research articles that identified the impacts of WebQuest on teaching and learning (Abbitt & Ophus, 2008).

Although a few studies on the WebQuest instruction have been conducted in the ESL and EFL settings, research results have revealed the effective use of WebQuest to enhance students' learning in reading and writing instruction (Tsai, 2005; Chuo, 2007). The findings show that WebQuest lessons help students learn better and increase their learning outcomes. Since there is little empirical evidence of the effect of the implementation of WebQuests in language instruction on student achievement, this study attempts to determine the effect of WebQuest modules in order to enhance student learning as well as to serve the educational policies of Rajamangala University of Technology Pra Nakhon, North Bangkok Campus. The researcher plans to develop WebQuest modules to teach engineering students in the "Technical English I" course and to empirically determine if the WebQuest modules are effective enough to enhance students' reading and writing abilities, to motivate students' learning engagement, and to develop their positive attitudes toward the use of these WebQuest modules.

1.2 Objectives of the Study

1. To develop Internet-based modules using a WebQuest model to teach Engineering students in the "Technical English I" course
2. To investigate the effect of the WebQuest modules on the students' English reading ability

3. To investigate the effect of the WebQuest modules on the students' English writing ability
4. To investigate the effect of WebQuest modules on the student's learning engagement
5. To examine the students' perceptions of the integration of WebQuest modules

1.3 Research Questions

1. How can WebQuest modules be developed?
2. What is the effect of the integration of WebQuest modules on the students' reading ability, and what is its effect size?
3. What is the effect of the integration of WebQuest modules on the students' writing ability, and what is its effect size?
4. What is the effect of the integration of WebQuest modules on the students' learning engagement?
5. What are the students' perceptions of the integration of WebQuest modules?

1.4 Statements of the Hypotheses

The following hypotheses are formulated in the present study:

1. The integration of WebQuest modules will increase the students' reading ability.
2. The integration of WebQuest modules will increase the students' writing ability.
3. The integration of WebQuest modules will have a positive effect on the students' learning engagement.

1.5 Scope of the study

According to the research objectives mentioned above, the scope of this study is as follows:

1. The WebQuest modules developed by the researcher were experimented with an intact group of 40 second-year undergraduate engineering students of Rajamangala University of Technology Phra Nakhon, North Bangkok Campus, who were enrolled in the Technical English I course in the second semester of the academic year 2008
2. The independent variable in this study is the developed WebQuest modules.
3. The dependent variables in this study are students' reading and writing abilities, students' learning engagement, and students' perceptions of the use of WebQuest modules.

1.6 Limitation of the study

1. The sample in this study was an intact group of engineering students. They were purposively selected. Therefore, the research findings may not be generalized to the other groups of population.
2. A one-group pretest-posttest design was employed as a research design in this study. With this design, the differences between the pretest and posttest scores might have been affected by internal threats to validity such as practice effects.

1.7 Definition of terms

WebQuest modules refer to the Internet-based teaching and learning materials for the "Technical English I" course using a WebQuest model which focuses on a particular task or problem which requires learners to help one another work out the problem by making use of authentic materials from the Internet which are related to their academic discipline. The tasks in the WebQuest modules are designed with expected learning outcomes of each of the lesson unit and explain what the learners have to do as they work their way through the WebQuest modules. They are structured to provide learners with scaffolding and support that direct them to reliable and appropriate websites and to avoid the frustration of time wasted on unproductive search for needed information. In this study, the WebQuests modules

are especially designed by the researcher to promote students' reading and writing proficiency in English in accordance with the "Technical English I" course goals and objectives specified by RMUTP.

Reading ability refers to the ability to comprehend the reading texts in English as specified in the "Technical English I" course goals and objectives of RMUTP. To be more exact, in this study, reading ability refers to the ability to comprehend the reading texts based on science and technology taken from the printed texts and the Internet. The students' reading ability was assessed by the reading test constructed by the researcher based on the course objectives. The assessment of reading ability in this study consisted of two subtests including vocabulary test and the measurement of reading comprehension as well as reading strategies of effective reading which included skimming for main idea and supporting ideas, scanning for details, guessing word meanings from context, making inferences, and using discourse markers.

Writing ability refers to the ability to write in English as specified in the "Technical English I" course goals and objectives of RMUTP. To be more exact, in this study, writing ability refers to the ability to write passages based on the task designed in the WebQuest modules: write a composition on a specific topic based on information gathering from the reading texts from the Internet. The focused linguistic features were describing cause and effect, similarities and differences, instructions and processes. The students' writing ability was assessed by means of scores obtained from the English writing test developed by the researcher based on the course objectives. The students were asked to write a composition based on the information from the reading texts from the Internet resources. The rubrics for scoring the students' test tasks were provided for the teacher in order to evaluate how successful the students had been in analyzing and transforming the information they found on the Internet.

Student learning engagement refers to student active involvement and participation in the learning tasks and learning process, as well as their positive emotional reactions towards the tasks and the integration of technology in classroom environment. Students' learning engagement in this study was assessed according to the following criteria:

1. Behavioral criteria (active student responses to an instructional process, such as asking and answering questions, solving task-related problems, contributing to group discussions, and participating in class discussions with teacher/peers)
2. Affective criteria (levels of interest and feelings toward the teacher, peers and the learning tasks).
3. Cognitive criteria (student efforts to integrate new materials with previous knowledge and to monitor and guide task comprehension through the use of cognitive and meta-cognitive strategies).

Students' perceptions refer to the students' opinions towards the application of WebQuest modules in terms of their usefulness, level of difficulty, and their degree of preferences to the implementation of WebQuest modules. The students were asked to write learning logs after each class of their study. The guided questions were provided for them so that the data obtained will cover all aspects of their perceptions.

1.8 Significance of the study

. The results of the study may prove that the use of WebQuests is an alternative instructional approach for ESP classes in terms of technical reading and writing skills, and it may challenge students' abilities with a variety of information sources. It is also anticipated that the findings of the study will contribute to the innovation in language teaching and learning and yield some insights into a sound pedagogical use of the Internet-based instruction. This study may provide implications for other teachers who wish to employ WebQuest models to develop other language skills of Thai students as well.

Theoretical contribution

The research study reflects some theoretical aspects underlying the WebQuest instructional approach, particularly the constructivism and sociocultural theories. It also provides some insights and makes contributions to additional knowledge concerning how the implications of these two theories affect the

enhancement of reading and writing skills as well as the promotion of student learning engagement in EFL settings.

Practical contributions

1. This study will provide English teachers with some guidelines in enhancing students' reading and writing achievement as well as the level of student engagement.

2. This study will provide English teachers with some insights into how to apply the integration of WebQuest approach in other EFL contexts as well as how WebQuest activities should be employed in order to develop other language skills of Thai students as well.

CHAPTER II

LITERATURE REVIEW

In this chapter, the researcher reviews the role of technology concerning language teaching. Then, since a WebQuest task is a type of Web-based instruction, the underlying principles of WBI which is brought about by the integration of ICT into classroom practice is explained. Different perspectives or viewpoints based on different theories of language learning, particularly between objectivism and constructivism, are also discussed. After that, the chapter elaborates respectively on the definition a WebQuest, its relationship to language learning, the principles of constructivism in WebQuest tasks, and their advantages. The last section of this chapter reviews students' learning engagement in technology-enhanced instruction.

2. 1 Technology in language teaching

2.1.1 Technology in Education

The role of Information and Communication Technology (ICT) is increasingly significant in educational fields. At present, a wide range of information and knowledge can be transmitted and received worldwide via the Internet and the World Wide Web. It can be seen that there are many benefits of using the Internet for teaching and learning. First, there are a tremendously large number of authentic materials available on the Internet and the World Wide Web which can be a source of unlimited resources that can bring exciting learning opportunities to language learners anywhere at any time (Bitter & Legacy, 2006). Second, it provides authentic language. Students can have immediate access to the Web which is used in real communication or commerce, not just for language instruction. From the World Wide Web, students can read current newspapers and magazines in whatever language they are studying. Third, it encourages collaborative work. For example, students can collaborate with e-mail partners, they can make use of teleconferencing for international discussion, or they can share their work online and invite a variety of comments and feedbacks.

Due to the advent of computer technologies, it cannot be denied that, in order to study and work in the future, it will not be sufficient if learners merely have the traditional skills of information gathering and storing, as well as the mere learning of facts. Therefore, as teachers, "we need a radical change in our approaches to teaching and learning in order to best prepare future generations for living and working in tomorrow's world" (Ruschoff & Ritter, 2001: 220). Pennington (2004: 7) also states that "the electronic information technology (IT) revolution is upon us, and the computer is having a major impact on the ways we interact with information and with each other." Therefore, there is a clear need for language teachers to keep up with the technological advancement, as Pennington (2004: 30) points out, "if we language teachers do not keep pace and adapt our practice, then we risk being left behind in the current context of global communication and information access provided by IT resources."

It is noteworthy that the role of computer technology in education is so vital that the International Society for Technology in Education (ISTE) has developed standards for teachers and students (Bitter & Legacy, 2006). The ISTE has identified six dimensions or standards that teachers should master as follows:

1. Technology Operations and Concepts: Teachers demonstrate a sound understanding or technology operations and concepts.
2. Planning and Designing Learning Environments and Experiences: Teachers plan and design effective learning and experiences supported by technology.
3. Teaching, Learning, and the Curriculum: Teachers implement curriculum plans that include methods and strategies for applying technology to maximize student learning.
4. Assessment and Evaluation: Teachers apply technology to facilitate a variety of effective assessment and evaluation strategies.
5. Productivity and Professional Practice: Teachers use technology to enhance their productivity and professional practice.
6. Social, Ethical, Legal, and Human Issues: Teachers understand the social, ethical, legal, and human issues surrounding the use of technology in schools and apply that understanding in practice.

Due to the standards set by the ISTE, teachers are required to maximize student learning in a technology-enhanced lesson and environment. Although there are many teachers who want to take advantages of current and new technology, they cannot do so because they lack technological skills, or they do not know how to integrate them into actual classroom practice. According to Healey (2003), current educational technology with more powerful computers, more multimedia software, and lots of websites will be able to help better teaching and learning in the case that teachers know how to find these resources and what to do with them. More importantly, teachers have to put a lot of efforts to find ways to handle and keep up with the upcoming changes in technology in order to reach those standards.

2.1.2 Education in Thailand based on the 1999 NEA

In Thailand, the National Education Act (NEA) of 1999 was developed during Thailand's Eighth National Economic and Social Development Plan (1997-2001), which had an aim of preparing Thai people to cope with a rapidly changing world in the 21st century. According to the 1999 NEA, education should focus on facilitating the country's development toward self-reliance, sustainability, and global competitiveness (Ada Raimaturapong, 2004). The 1999 NEA was launched to enhance the quality of education with the following goals:

1. Lifelong education for all
2. All segments of society participating in the provision of education.
3. Continuous development of the bodies of knowledge and learning processes.

To cope with the technological advancement and the impacts caused by the new era of modern technology, the existing Thai educational system needs to be reformed. As the educational reform in Thailand views education as a lifelong process, the reform of curriculum and learning is an urgent basis to serve this view and to raise educational quality of all types and levels. Pitiyanuwat and Anantrasirichai (2002) conclude the process of raising quality of education as follows:

1. Organizing teaching and learning processes based on the goals and objectives of the educational reform
2. Creating activities for preparedness in learners while developing curriculum of all types and levels based on the following major principles:
    - Creating a happy learning environment for learners of all level;
    - Organizing teaching/learning processes that require systematic thinking and emphasize practice rather than rote learning. Learners will be able to analyze, synthesize, and build a core knowledge that will form the basis for learning in the future world;
    - Encouraging learners to learn more from nature and the environment;
    - Ensuring that learners use the experience and knowledge gained from his/her family and community as part of teaching/learning activities according to the curriculum.

It can be concluded that the above process of raising the quality of education based on the current educational reform in Thailand has to be taken into account as a major concern on a national basis for all teachers across the nation. The policies and guidelines in the Educational reform Act must be translated into classroom practice in all schools and universities including Rajamangala University of Technology Phra Nakhon.

2.1.3 Rajamangala University of Technology Phra Nakhon (RMUTP)

The educational plans at RMUTP have been translated from the demands and goals of the educational reform into the university educational policies. According to the current educational reform in Thailand and the RMUTP educational plans to improve the quality of teaching and learning, the curriculum

should respond to major goals and principles, and teachers are responsible for the adjustment of their teaching accordingly, for the implication of computer technology to support student learning in a technology-enhanced environment, for the application of technology to develop students' higher-order skills in the learning process, and for the change of teaching practices from teacher-centered to learner-centered learning.

The policies do have impacts on EFL teachers and have brought about a number of significant changes. The teachers have to translate the policies into the new teaching approach changing the ultimate goal of education from traditional teacher-centered learning environment to learner-centered instruction and active learning perspectives. As a result, the roles of teachers and students have also changed. The teachers or instructors now become learner-centered educators in charge of preparing the instructional environment, anticipating the needs of the students in advance, and facilitating the process of learning, while the students must actively involve in the learning process (Fluck, 2001).

At RMUTP, the curricula for foreign language instruction, particularly for English language teaching, has been developed on the basis of using the same curricula for all campuses. The teachers of each campus are responsible for producing their own teaching materials based on the existing core curricula. At North Bangkok campus, all teachers of English use the same teaching materials created by staff of the department, but they are free to choose their own teaching methods. It is found that the traditional method of teaching is still dominant here. Many teachers and students get used to teacher-centered environments. Thus, it may be difficult to prepare and lead them to the idea of learner-centered education. Perhaps because of this, there is a lot of pressure for the urgent need of many changes due to the university's educational policy.

As previously mentioned, RMUTP teachers have to be responsive to the educational policy and take action for computer-based instruction in all subject areas including the English language. It is beneficial for teachers to get started by taking into consideration the pedagogical principles when integrating technology into classroom practice in terms of the development of Computer-Assisted Language

Learning (CALL), as well as their advantages and limitations, which are reviewed in the next section.

2.2 Computer-Assisted Language Learning (CALL)

The use of computer technology in the classroom is referred to as Computer Aided Instruction (CAI). When it is used in language teaching and learning, it is known as Computer Assisted Language Learning (CALL) (Chinnery, 2005). Since computers have been widely used and their uses have expanded so dramatically, language teachers have to think about the implication of computer technology for language teaching and learning (Warschauer, 1996). How computers have been used in language instruction can be reflected by the use of computer-assisted language learning (CALL) as it involves the use of computer technology for educational purposes in language teaching (Timucin, 2006).

According to Warschauer (2001), there are three distinct phases of CALL which are referred to as structural CALL, communicative CALL, and integrative CALL. At the earlier stage of CALL, the principal use of computers is mainly in the form of drills and practices based on the structural approaches. Later on, the new trend of using computers in English teaching has developed to communicative CALL and integrative CALL, respectively.

When computer-assisted language learning (CALL) was first introduced and implemented, it was traditionally designed to structure learning along the behaviorist and structural principles (Warschauer, 1996). That is, learners used computers in a computer lab to work individually through drill-and-practice grammar software. Along the lines of behaviorist and structural models, CALL courseware was in the form of pre-planned discrete steps and repetitive drill-and-practice exercises (Steven, 1989 cited in Warschauer, 1996). The rationale behind CALL drills and practice was that a computer was ideal for carrying out repeated mechanical drills practice and for providing immediate and non-judgmental feedback for learners. In addition, a computer allows an individual student to learn at his/her own pace (Warschauer, 1996).

Later, behavioristic CALL or structural CALL was undermined in the late 1970s and early 1980s because behavioristic and structural approaches to language learning had been rejected for both theoretical and pedagogical reasons. Besides, research findings revealed that CALL drill-and-practice lessons did not affect any greater achievement than ordinary instruction (Chapelle & Jamieson, 1989 cited in Warschauer, 1996). Although drill-and-practice software was useful for some individuals and for remediation, it did not provide opportunities for learners to engage in authentic social interaction (Egbert & Hanson-Smith, 1999).

The second phase of CALL was based on the communicative approach to language teaching. This approach rejects the drill and practice programs because these drill-and-practice exercises do not allow enough authentic communication (Waschauer, 2001). As a result, a new scenario of the computer-assisted classroom is emerging since there have been shifts in emphases in language teaching from form to function and from product to process. To enhance real communication in a CALL environment, technology is not used for its own sake, but for the communicative goal of language learning (Egbert & Hanson-Smith, 1999). In this setting, grammar is taught implicitly. The purpose of CALL activities is no longer for finding the right answer, but the focus is placed on the interaction, negotiation of meanings, and discussion among learners.

The third phase is integrative CALL which is based on the important developments of multimedia and the Internet. Warschauer (2001) explains the differences between communicative CALL and integrative CALL as follows. In communicative CALL, the cognitive view of language learning is very important, and communicative exercises are used for practicing the English language. Through interaction, students will develop language as an internal mental system. Integrative CALL is based on a socio-cognitive view of language learning. The purpose of interaction is to help students learn to enter new communities and familiarize themselves with new genres and discourses. In this type of CALL, the Internet is used by students to perform real-life tasks to solve real-life problems in a community of peers and mentors. Therefore, language practice in CALL becomes generated by providing numerous activities involving real communication and a rich source of language data.

As for integrative CALL, Warschauer (2001) points out that the objective of CALL should be accuracy, fluency, and agency, whereas communicative CALL places its emphasis only on accuracy and fluency. Agency is also another major aspect that has to be taken into consideration. The agency refers to the power to construct a representation of reality, or something that makes students so excited about using computers in the classroom. Thus, studying English is not just to "know it" as an internal system, but to be able to use it to have a real impact on the world as well.

The history of CALL suggests that computer technology has been used in language classrooms for many years. Over this time, teaching and learning mode has moved from the traditional drill-and-practice to more interactive and communicative application, including e-mail, chat, and web-based programs (Murray, 2005). As a language teacher, in order to keep up with the future world, it is necessary to find out "how new technologies can facilitate acquisition of L2 literacies and what L2 literacies are needed for learners to participate in an increasingly digital world" (Murray, 2005: 188).

It can be seen that the trends in computer-assisted language learning have been changed accordingly. Up until recently, in the case of L2 teaching, CALL involves simulations, electronics communication, and multimedia production rather than simple drill-and-practice tutorials (Egbert & Hanson-Smith, 1999). Besides, the use of technology in language classroom is moving towards the use of the Internet or the World Wide Web as in Web-based instruction (WBI) (Ally, 2004).

2.3 The Internet and literacies in language teaching

The use of the World Wide Web (WWW) and the Internet has had many positive effects on education, and they are an important factor in changing the context of English teaching because the WWW can be a source of unlimited resources that can bring exciting learning experiences to learners anywhere at any time (Bitter & Legacy, 2006). Also, learning via the Web enables both synchronous and asynchronous communication. It can be seen that the integration of the Web into

language classroom provides educators and instructors with opportunities to implement new teaching and learning practice (Jung, Jun, & Guenwald, 2006).

According to Grisham (2001), the development of digital technology is changing the way we think about literacy. Traditionally, the word "literacy" has been used to refer to the ability to read and write. Davis (2003) explains that this definition is too narrow for the modern society. He points out that literacy should include "the ability to function effectively across a broad range of social, academic, and business contexts using a variety of informational techniques and procedures" (Davis, 2003: 19). According to Warschuer (2001), the term "literacy" is not only about "reading the word," but also about "reading the world," as well as "writing it and rewriting it." This concept has been an important part of critical pedagogy in the sense that computers and English are now regarded as vital tools for students to read about the world, to write about it, and to rewrite it (Warschauer, 2001).

Another similar definition is given by Camacho (2005: 28) who states that "Literacy means the competence to carry out complex tasks using reading and writing related to the world of work and to life outside school." It is interesting to note that the ability to read and write has been redefined accordingly due to the increasing role of modern technology in language teaching and learning.

The technological advancement is also changing the way we teach reading and writing skills (Grisham, 2001). Today, the Internet and the Web are widely used to enhance students' reading and writing skills (Chinnery, 2005). In a reading class, the Web is used to teach reading skills in the way that teachers can ask students to read and gather the information from the websites related to a specific topic, which, according to Egbert and Handson-Smith (1999), is seen as an authentic task. They explain that "For those who are engaged in workplace-related or academic Web work, finding reliable information on the Internet is a real-life task" (p. 117).

The modern technology affects the writing class as well. There are certain changes caused by the combination of technology and writing. For example, in computer-equipped classrooms, assignments can be easily distributed among students or posted on line. Also, students' work can be published on the World Wide Web, attracting feedback from readers elsewhere and exposing the students to a

wider variety of opinions. Besides, the instructor can ask students to use collaborative tools to comment on each other's essays. This also leads to more communication and more collaboration with the high-tech tools. With these high-tech tools, the grammar checkers and spell checkers can be used because in the real world people are allowed to use these tools as well.

It can be concluded that in terms of new literacy in the digital world, reading and writing abilities are viewed differently. To read is no longer to attempt to understand the meaning of an external author, but to be able to interpret information and create knowledge from a variety of sources. Students in this online era must possess online reading and research skills which include selecting the right questions, choosing the right tools, finding information, archiving and saving information, interpreting information, and using and citing information (Warschauer, 2001). Peterson et al. (2003) share a similar view when they assert that WebQuests provide a new instructional approach for developing academic literacy skills as students have opportunities to engage in authentic reading and writing experiences when doing the WebQuest tasks.

2.4 Web-based Instruction

Recent advances in the Web technology and applications have rapidly changed our life in various ways. Such advances provide new ways for people to communicate globally and yield access to a more readily available large amount of information and knowledge. The Web also provides opportunities for scholars and educators to implement a wide range of new teaching and learning practices which enable learners to be exposed to different classroom experiences. Consequently, the Web is regarded as a useful teaching aid in Web-based Instruction (WBI).

Different scholars define WBI in different ways. For instance, Miller and Miller (1999: 106) define it as "instruction via the World Wide Web that features hyperlinking as well as communication capacities." Moreover, Khan (1997 cited in Henke, 2001: 5) defines WBI as "…a hypermedia-based instruction program which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported." Finally, Clark (1996) defines WBI as "individualized instruction delivered over public or private

computer networks and displayed by a Web browser." According to these definitions, WBI focuses on the instructional use which takes the potential benefits of the Internet and World Wide Web for delivering information.

WBI is a rapidly growing instructional format and an increasingly popular method for delivering college courses (Ally, 2004). In the earlier implementation of WBI, the overriding educational principle is merely access to information (Moallem, 2001). WBI courses are, therefore, typically developed by using computer communication technology and communication tools in order to access to the information needed.

Today, WBI does not simply mean using the technology as information presentation, but it is indeed a matter of using technology to reach instructional goals. In this case, teachers need to be involved in deciding the best ways to make use of computer potentials for their own students (Egbert & Hanson-Smith, 1999). Moallem (2001) also asserts that instructional design for Web-based courses should be the systematic development of instructional specification using learning and instructional theory and best practice to ensure the quality of instruction.

In education, especially in the field of L2 teaching, the role of the computer technology has gradually been transformed from that of "tutor" to that of a "tool" (Warschauer, 2002). The technologies themselves do not influence student achievement (Ally, 2004). Instead, Ally claims that the technologies are merely "vehicles that deliver instruction;" therefore, the WBI must be designed properly to effectively engage learners and promote learning.

As far as the integration of technology in language teaching is concerned, Levy (1990 as cited in Egbert & Hanson-Smith, 1999) points out the need for a theory of computer-assisted language learning (CALL) that would provide educators with a framework for teaching and learning with technology. He also notes that theory of CALL is needed so that it could assist teachers in making decisions about ways to prepare language learners for the high-technology in the future that they face. Thus, WBI also needs to be based on a sound pedagogical principle in order to enhance student learning in technological environment.

There is an ongoing debate about the theory of teaching and learning in WBI. There are many schools of thought on learning for designing learning materials with the use of the Internet and the WWW. Moallem (2001: 114) maintains that "two commonly used instructional design models and principles are (1) objectivist, traditional instructional design models… and (2) constructivist instructional design models…" Therefore, these two principles are reviewed in the following section.

2.4.1 Objectivism (Behavioral psychology)

The goal of any kind of instruction is to promote learning. Therefore, before any learning materials are developed, educators must know the principles of learning and how students learn. The development of teaching and learning materials should be based on proven and sound learning theories because the design of the course determines the effectiveness of the learning (Ally, 2004).

Early computer learning systems were designed based on objectivism or the behaviorist approach to learning. The behaviorist school of thought viewed learning as a change in observable behavior caused by the external stimuli in the environment (Skinner, 1974). This approach is closely related to B.F. Skinner's behaviorism which emphasizes rote learning and memorization through repetitive drills in which learners are rewarded by the right to move forward to a new level of drill practice. Nunan (2003) notes that the integration of computer technology in language classroom which is related to the behaviorist method of teaching can be seen in some settings. In other words, the use of computer and technology is only a supplement to traditional classroom teaching method. These computer-based activities include behaviorist computer-based gap-fill drills in which learners answer questions or fill in information in cloze exercises.

Following the long period of rote learning based on behaviorism, the limitations of such an approach became apparent because some educators claim that not all learning is observable and that there is something more to learning than a change in behavior. Thus, this instructional design model does not involve real communication (Nunan, 2003). As a result, there was a shift away from behaviorism to the current learning theory, constructivism

2.4.2 Constructivism (Cognitive psychology)

The constructivist paradigm reflects a position that knowledge is not independent of the learner but is internally constructed by the learner as a way of making meaning of experiences (Moallem, 2001). Within a constructivist theory, learning is defined as an active process in which learners construct new knowledge based on current and past knowledge and experiences.

There are some differences between objectivism and constructivism. Moallem (2001) has made a distinction between objectivism and constructivism theory behind WBI as follows: objectivists believe that knowledge and truth exist outside the mind of the individual learner and are therefore objective in this sense. Learners are told about the information, and they are expected to replicate its content and structure in their thinking. This theory aims at preparing learners to achieve the intended learning outcomes. Unlike objectivism, constructivists believe that knowledge and truth are constructed by learners and do not exist outside their mind. Therefore, according to constructivists, learners construct their own knowledge by actively participating in the learning process.

A dominant characteristic of constructivist learning is collaboration among learners. Collaboration occurs when learners communicate their understanding, listen to the views of others, explore alternative perspectives, and are challenged in their beliefs as well as challenge others. Engagement in real world or authentic tasks provides a context for learners to construct meaning from their experiences. It can be seen that the constructivist uses technology tools to enhance communication through collaboration (Davis, 2003).

According to Moallem (2001), constructivist instructional developers value collaboration, learner autonomy, generativity, reflectivity, and active engagement. The major instructional goals of WBI based on the cognitive constructivist approach are presenting a problem-solving situation in a realistic context and providing opportunities for learners to collaboratively construct knowledge based on multiple perspectives, discussion, and reflection.

Despite the on-going debate between objectivist and constructivist instructional design models in WBI regarding which approach produces the best

practice, many educators use a combination of theories to develop learning materials and designing WBI courses. The designer and developer of the materials and the course must have a good knowledge of each learning approach so that they can select the most appropriate instructional strategies that motivate learners, facilitate deep processing, encourage interaction, provide support during learning process, and promote meaningful learning (Ally, 2004). Moallem (2001) also decides to employ mixed instructional design models between these two approaches. He assumes that the effective WBI depends upon learning experiences appropriately designed and facilitated. Different learners have different backgrounds, experiences, and learning styles; therefore, WBI should address these differences by providing significant experiences for each individual learner.

Despite the fact that constructivism is the current trend in language teaching and that it is considered as a proven and sound learning theory for the effective WBI, traditional ways of language instruction are still around. Ruschoff and Ritter (2001) admit that even today the effect of traditional behaviorist theories of language learning with their transmission-based modes of learning are still dominant in language classrooms. However, they state that traditional skills of information gathering and storing as well as the mere traditional learning of facts will not be sufficient in order to live, work, and learn in the near future. Therefore, learning must be viewed as the process of active, creative, and socially interactive learning; and knowledge as something learners must construct rather than something that can be transferred.

According to LeJeune and Richardson (1998), several constructivism theories guide the development and design of active learning environment. Constructivists view learning as a continual, active process of constructing new knowledge or meaning through past and current experiences, perceptions, and internal representations of knowledge with every new learning opportunity. The learners use existing knowledge called schemas to select and modify information, build hypotheses, and make decisions.

Properly designed Web-based learning can encourage active learning environment in the way that students are encouraged to work in a task that needs

collaborative work and incorporates an interaction and that lets learners construct their new ideas by accommodating new information into prior knowledge. Consequently, successful instruction and positive learning outcomes of the WBI are directly tied to constructivist theory of learning (LeJeune & Richardson, 1998).

When there is a shift from traditional instruction to constructivism, the instructor's role in WBI is also changed. The instructor becomes a facilitator guiding and encouraging the interaction, rather than the one who dispenses knowledge to the learners. The learners' role has to be changed as well—from passive to active participants. That is, they are no longer passive recipients of information, but they are motivated to become engaged in the learning activities.

A number of studies have investigated the role and the effects of the Web and the Internet on language learning. For example, Wegner et al. (1999) conducted a study to investigate the effects of distance learning Internet-based instruction on student achievement as well as the impact of distance learning on students' attitudes concerning their learning experience. Students in the control group (N = 17) were taught with the traditional teaching method, whereas the control group (N = 14) attended no classes on-campus except to present their final products. Students' test scores and satisfaction survey results from the experimental group were compared to those of a control group. The data from survey questionnaires were calculated into mean scores. Comments given by students were categorized and presented in terms of percentage. The findings revealed that there was no significant difference between the test scores of these two groups. With regard to student perceptions and their learning opportunities, students in the experimental group had a more positive feeling about the course but they were not statistically significant.

This research study yields a lot of interesting conclusions. First, although students in the experimental group did not attend classes, there was no significant difference in test scores between the two groups. Second, the role of the instructor changed. Unlike the role of traditional classroom teachers, the instructors for the Internet-based instruction changed their role to act as a coach, resource providers, and motivators responsible for preparing the instructional environment, anticipating the needs of the students in advance, assisting them to develop their own meaning, and providing contingencies. Third, Internet-based delivery of coursework had no

negative effect on students' perception of their learning. Finally, the researchers concluded that the use of technology in any capacity does not guarantee academic success, but indications from this study suggest that it does not necessarily have any significant negative effects either.

Another study which reveals similar results is that of Shiratuddin (2001). The study is aimed at investigating the effect of Internet instructional method on students' performance. The experiment was carried out with two groups of unrelated students over a period of two semesters in Multimedia Design (TV3014) course offered at the school of Information Technology, Universiti Utara Malaysia. One group of 81 students was taught with conventional method: teaching materials were paper-based printed textbooks, whereas the other group of 88 students was taught with the Internet-based or online electronic book. These two groups were compared to see the effect on students' performance in the course. The findings revealed that, although there was no significant effect of Internet instructional method on students' performance, there was some indication that incorporating Internet environment and resources into conventional teaching could increase educational value, promote learning, and provide students with good experiences.

In the Thai context, Whattananarong (2002) carried out a study to investigate and compare the effects of Internet-based teaching and learning systems and traditional instruction on students at King Mongkut's Institute of Technology North Bangkok. The study sample consisted of 80 graduate students randomly selected and divided into four control groups studying with the traditional teaching method and four experimental groups studying with the Internet-based instruction system. The results indicated that the scores of the experimental groups were not significantly higher than those of the control group and there was no negative effect on the students. The results also revealed that the teacher's role changed when the Internet-based instruction was employed, but it did not change the learning outcome of the students. It is interesting to note that although the use of Internet-based does not enhance academic success, the findings from this study suggest that it does not have significantly negative effects either.

The major focus of the aforementioned studies was on the use of computer technology as an important tool in educational context. It is not surprising that a

great deal of research is now increasingly devoted to the integration of the use of computer in language teaching and learning. Although many research findings reveal that there is no significant effect of computer-based learning on student academic performance, this technology is still found useful for promoting student learning. Besides, there is evidence of positive effects of the use of the Internet and the World Wide Web on students' motivation to learn. Despite lack of conclusive findings on the effects of the technology on language development, it is undeniable that currently there is growing pressure on language teachers to help their learners utilize these technological tools effectively in language learning. Recently, one effective web-based tool that has excited a lot of teachers is the WebQuest. In the next section, the review is elaborated on definition and characterization of WebQuests, underlying learning theories and principles, advantages, and major research findings on the implication of WebQuests in language teaching and learning.

2.5 WebQuests

Technology lends itself well as a powerful tool in language learning and instruction. It is certainly the case in many countries including Thailand that the desire to incorporate computer technology into higher education teaching and learning has been firmly placed on the educational policy, and there are many possible ways of doing this. One of the latest promising developments for educational use of the Internet and World Wide Web is the WebQuest (Shiratuddin, 2001). In addition, Felix (2002) states that WebQuest is one of the latest best-practice application on new learning approaches for Web-based language learning. More recently, Bitter and Legacy (2006: 126) also mention that "one recently accepted and systematized form of online instruction is the WebQuest."

2.5.1 Definitions and components of WebQuests

"WebQuest" is the name given to an instructional model for web-based learning projects which draw on information and resources from the Internet

(Murray & McPherson, 2004). The originator of this instructional format for web based lessons is Dr. Bernie Dodge, a professor at San Diego State University (SDSU). In 1995, he came up with the idea of designing a WebQuest model to integrate the use of the Web into classroom activities. He defines it as "an inquiry-oriented activity in which some or all of the information that learners interact with comes from resources on the Internet." (Dodge, 1995: 1). Since then, WebQuests have become popular among educators who are interested in utilizing the Internet as an instructional tool.

Tom March, one of the WebQuest co-developers, has been another major advocate of WebQuests in education and has contributed to the understanding of their use. He develops a lot of Web-based activities, tools, and strategies for teachers integrating the Net into classroom activities. According to March (1998: 2), a WebQuest is "a scaffolded learning structure that uses links to essential resources on the World Wide Web and an authentic task to motivate students' investigation of a central, open-ended question, development of individual expertise, and participation in a final group process that attempts to transform newly acquired information into a more sophisticated understanding."

Based on this definition, March elaborates that scaffolding is at the heart of the WebQuest model. Scaffolding is a procedural facilitation that helps learners to perform the task beyond their current cognitive skill. Such scaffolding in WebQuests which allows students to solve problems and complete the complex tasks can be in the form of resource links, a compelling problem, templates for student production, or guidance for specific skills (Dodge, 1995).

WebQuests are also different from other Web-based lessons and experiences in that they focus on an engaging and achievable task. WebQuest tasks go beyond simply answering questions; they require higher order thinking skills such as creativity, analysis, synthesis, judgment, and problem solving. Students are expected to take the information that they interact with and transform it in order to create new information that has meaning to them (March, 1998).

There are two types of WebQuests: short-term and long-term WebQuests (Dodge, 1998). The former involves knowledge acquisition and integration; the

latter involve extending and refining knowledge through analysis and transformation of that knowledge and demonstrating an understanding of the knowledge by creating something.

Generally, WebQuests consist of five main components:

Introduction: The introduction to a WebQuest is normally used to introduce the scenario and central question. It briefly explains the activity and provides background information which learners need to understand in order to complete the assigned task.

Task: This is the most important part of a WebQuest because it provides focus for learners' activities. It explains clearly and precisely what the learners will have to do as they work their way through the WebQuests. The task should be feasible and interesting.

Process: A description of the process is provided for the learners to follow to complete the assigned task. The process identifies the steps the students should go through to accomplish the learning goal. It also includes the online resources they will need. A list of information sources or Internet sites is pre-selected to allow learners to focus on the topic and avoid aimless surfing on the Web so that they will be able to complete the task within the time available. This part also offers advice on how to divide responsibilities among participants and some guidelines on how to organize the information. At this point, scaffolding can be included to provide help in the learning process.

Evaluation: The evaluation part describes how the task will be evaluated in the form of rubrics. The rubrics clearly identify the indicators for important aspects of learner performance or the product.

Conclusion: The conclusion brings closure to the activity and summarizes what the teacher hope learners have learned as a result of completing the activity. It may also encourage them to extend their gained knowledge or thinking beyond the lesson to other domains.

2.5.2 Theoretical framework for WebQuests

2.5.2.1 Constructivism

Over the past decade, language learning theory has seen a shift from the highly guided to the more open learning environment with constructivism as a new and very much learner-centered paradigm for learning. Ruschoff and Ritter (2001: 223) state that "learning based on constructivist principles…such approaches are gaining approval and are regarded by many educational thinkers as a suitable theoretical framework for the learning environment of the future."

Constructivists claim that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences. When people encounter something new, they have to reconcile it with their prior knowledge and experience. Then they may change what they believe, or may discard the new information because it is irrelevant. Thus, with regard to constructivist theory of learning, by using analysis and synthesis, we develop new knowledge based on the results of the new and old information. When this occurs, it is said that we have constructed knowledge. This is not the same as simply memorizing a series of facts (Medley, 2004).

Within the constructivist framework, learning is "interactive in the sense that learners must interact with a source of ideas/knowledge, as well as in the sense that they must take an active part in reconstructing ideas/knowledge within their own minds." (Wilson, 2003:1) To shift from the traditional method of teaching to learner-centered approaches, it is vital to think about how the above theoretical framework can be put into practice (Ruschoff & Ritter, 2001).

As mentioned earlier, constructivism is basically a theory based on observation and scientific study about how people learn. To put the theory into practice, Ruschoff and Ritter (2001: 224) point out that the following major contributions of constructivism have to be taken into consideration:

- Learning must be regarded as an active and collaborative process of knowledge construction;

- Learning is to be seen as an autonomous process, to be regulated by the learners' expectations, goals, existing schemata, and intentions;
- Learning is a process of experimentation based on previous knowledge and experience;
- Learning is a process of socially negotiated construction of meaning;
- Learning is a process which must be supported by a rich learning environment rooted in real life and authentic situations.

Ally (2004) has proposed the implications of web-based online learning based on the constructivist learning theory as follows:

- Learning should be an active process.
- Learners should construct their own knowledge rather than accepting what is given by the teacher.
- Collaborative and cooperative learning should be encouraged to facilitate constructivist learning. This will give learners real-life experience of working in a group and will allow them to use their metacognitive skills.
- Learners should be given control of the learning process. They can take part in making decision on learning goals with some guidance from the instructor.
- Time and opportunity should be given for learners to reflect and internalize the information.
- Learning should be meaningful for learners.
- Learning should promote higher-level learning and social presence.

Therefore, language learning as well as learning in general should be described as an interactive, dynamic process in which new knowledge is most fruitfully acquired when learners are placed in a situation where they can explore

sources and resources rather than in a context of mere formal instruction" (Ruschoff & Ritter, 2001: 225). In such a scenario, learners are seen as active constructors of knowledge who bring their own needs, strategies, and styles to learning, and that skills and knowledge are best acquired within realistic contexts and authentic settings, where learners are engaged in experiential learning tasks (Ruschoff & Ritter, 2001).

In classroom settings, constructivism transforms learners from passive recipients of information to active participants of the learning process. Learners are not blank slates, but they are those who come to learn with prior knowledge and understanding. They create new understanding for themselves by using their previous knowledge as the raw material. To help learners actively construct knowledge, teachers should create rich learning environments with "opportunities for authentic, project-based tasks, as well as a variety of technology and non-technology tools" (Bitter & Legacy, 2006: 29).

The underlying philosophy of the WebQuests is based on the principles of the constructivist educational theory (March, 1998). Many educators have connected WebQuests with the constructivist approach to learning (Davis, 2003). The WebQuests are created by defining the problem to be solved, defining steps involved, and providing resources for learners, and thus the Internet becomes a tool that facilitates information exploration and knowledge construction. When carrying out the WebQuest tasks, learners are learning materials in a constructivist manner (March, 1998).

One of the basic tenets of the social constructivist learning theory found in the WebQuest tasks is that of scaffolding (Davis, 2003). In its literal sense, scaffolding refers to a support structure that is erected around a building under construction. When the building is strong enough, the scaffolding can be removed. In the metaphorical sense used by Vygotsky (1978), scaffolding is defined as the supports provided by others–parents, teachers, peers, or reference sources such as dictionaries which enable learners to learn and perform better in the target language (Yang & Wilson, 2006).

Scaffolding is a term often used when referring to WebQuests. It is “a temporary structure designed to provide help at specific points in the learning process” (Smith & Baber, 2005: 43). It can provide guidance or support to enable learners to achieve tasks which they could not do on their own (Davis, 2003). WebQuests have a built-in learning objective and a means of achieving this objective by the inclusion of scaffolding to allow learners to solve problems and complete tasks that would be beyond their ability without assistance (Lamb & Teclehaimanot, 2005).

In WebQuests, scaffolding can take a variety of forms, such as resource links, a compelling problem, templates for student production, or guidance for specific skills (Dodge, 1998). It can be necessary vocabulary or linguistic features that help learners overcome the reading comprehension part, for instance. Since scaffolding can be temporary, Dodge (1995) stresses the need to fade scaffolds after learners have gained experience and skills to a certain extent.

Within the WebQuest context in language learning, Smith and Baber (2005: 43) identify three types of scaffoldings as follows:

- Reception scaffolding helps learners learn from a given resources and retain what has been learned (e.g. giving learners advice in using online dictionary, providing practice exercises on important grammatical focus and necessary reading strategies, etc.).
- Transformation scaffolding helps learners with transforming the information, including comparing/contrasting, finding patterns, brainstorming, or decision-making (e.g. giving learners a chart to complete with the pros and cons for the different options they are considering).
- Production scaffolding helps learners with the production aspects of the task by providing them with templates, models, writing guides, etc. (e.g. a list of useful language for writing and making a presentation in English).

The concept of scaffolding is also linked with what Vygotsky calls the learner's Zone of Proximal Development (ZPD) (Savin-Baden & Wilkie, 2006). Vygotsky (1978: 86) defines the ZPD as "the distance between a child's actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under guidance or in collaboration with more capable peers." Simply put, there is a distance between what children could do on their own and what they could perform when getting assistance from others or working together with their teacher.

When students are asked to perform tasks that would normally be slightly beyond their ability without the assistance and guidance from the teacher, scaffolding needs to be provided to assist their learning. Appropriate teacher support and guidance is one kind of scaffold that can allow students to function at the cutting edge of their individual development within the ZPD. Based on Vygotsky's view, the role of teachers in learning is to guide their students to pay attention to and concentrate on what they are learning. Through teacher's guidance, students can go beyond their actual capacity (Sutherland, 1992). Apart from the teacher's support and guidance, interaction with more capable peers is an effective scaffold in the learning process. Through the process of learning by interacting with the teachers and peers, more capable peers can help less advanced members work successfully within the zone of proximal development (Medley, 2004).

With regard to classroom interaction in constructivist learning and teaching, it is interesting to draw attention to a socio-cultural theory, developed by Vygotsky, which emphasizes that social interactions play important roles in an individual's cognitive growth and development. In this theory, "[e]very function in the child's cultural development appears twice: first on the social level and later on the individual level-first, between people (interpsychological) and then inside the child (intrapsychological)" (Vygotsky, 1978: 57). Put another way, based on the socio-cultural perspectives, everything is learned on two levels: first, through interaction with others, and then integrated into the individual's mental structure. Therefore, social interaction plays a fundamental role in the process of individuals' cognitive development.

Based on this theory, in classroom settings, the teacher and more capable peers are usually referred to as “More Knowledgeable Others” (MKO). The MKO is someone who has a better understanding or a higher ability level than the learner, with respect to a particular task, process, or concept (McLeod, 2007). However, the implication of the concept of MKO is not limited only to a person, but also refers to the use of electronic performance support systems, such as electronic tutors. The reason is that these systems or tutoring programs do “have more knowledge about the topic being learned than the learner does” (McLeod, 2007: 2).

According to Tharp and Gallimore (1988: 6-7), "[the sociocultural perspective] has profound implications for teaching, schooling, and education. A key feature of this emergent view of human development is that higher order functions develop out of social interaction. Vygotsky argues that a child’s development cannot be understood by a study of the individual. We must also examine the external social world in which that individual life has developed...Through participation in activities that require cognitive and communicative functions, children are drawn into the use of these functions in ways that nurture and 'scaffold' them."

The implications of this view of socio-cultural theory are that learners should be provided with socially rich environments in which to explore knowledge domains with their fellow students, teachers, and outside experts. Such type of learning environment is an important component in WebQuest classrooms. When studying with WebQuest activities, social interaction occurs when learners share their prior knowledge and their new constructions. Then they are required to interact with others to solve problems or accomplish the tasks. Through the process of sharing, the learners involved are able to experience the analysis and synthesis of information learned of the group members or more advanced peers as well as to receive support from the teacher. Consequently, “the assimilation of others’ understanding often leads to a richer and deeper learning by each individual” (Medley, 2004: 3).

Since learning through WebQuest modules is a new experience for many Thai students, teachers need to carefully scaffold tasks and activities throughout the learning process. They should know what the necessary assistance should be provided to enable students to accomplish the tasks. Apart from all three kinds of scaffolding previously mentioned, students may need to scaffold how they carry out their responsibility from a given role and how they effectively cooperate with other group members in order to accomplish the assigned tasks.

In this study, the purpose for providing the necessary supports or "scaffolds" is to make a wide range of target language texts comprehensible to students, and to help them perform the tasks which are beyond their capacity. The scaffolds are their teacher and more capable peers. Besides, scaffolds can be online dictionary, learning strategy supports, Web links for providing background information, as well as a variety of vocabulary building and grammar learning supports including pre-selected websites for online exercises and quizzes. Since the students in this study are not familiar with being exposed to a wide range of authentic texts from the Internet, these scaffolds are considered useful for them when processing the meaning of the texts that otherwise would have been inaccessible. Additionally, the students themselves are the ones who choose the type of supports they require.

2.5.2.2 Cooperative Learning

Cooperative learning is a leading instructional approach in which learners work together in groups to accomplish a common learning goal. This approach has been found to be highly effective both in education in general and in second language learning (Dornyei, 1997). Comparing to competitive or individualistic learning in a traditional classroom, cooperative learning is "more effective in promoting intrinsic motivation and task achievement, generating higher order thinking skills, improving attitudes toward the subject, developing academic peer norms, heightening self-esteem, increasing time and task, creating caring and altruistic relationships, and lowering anxiety and prejudice" (Oxford, 1997: 445).

Oxford (1997) indicates that cooperative learning is not just a group work; it adheres to the following essential principles:

1. Positive interdependence: Gains for one learner are associated with gains for others. For example, a specific goal like a grade is identified for the group to attain. Learners are told that they will have to support one another because the group goal can be achieved only if each member makes a contribution to the group's effort to complete the assigned task.
2. Accountability: Each member of the group is accountable through individual grading and testing. Every person has to make a contribution to achieving the group's goal. In this case, the group is accountable through a group grade.
3. Team formation: Teams of learners are formed randomly, or by using specific criteria.
4. Team size: The size of the group is relatively small. The recommended size is four to five students. In addition, groups should contain both males and females and learners of different ability levels.
5. Cognitive development: This is often viewed as the main goal of cooperative learning.
6. Social development: Development of social skills such as turn taking, active listening, and so forth can be as important as cognitive development.

Dornyei (1997) has concluded the characteristics of cooperative learning into three major components. First, learners spend most of the time in class working with their peers in small groups of between three and six members. Second, the teacher has to structure learning process so that each group member is motivated to master the material or to achieve the instructional goal. Third, it is important to evaluate and reward the group's achievement, rather than individual achievement. To be more specific, the essence of cooperative learning can be contrasted with "competitive and individualistic classroom structure" (Dornyei, 1997: 483) in which learners are required to work individually to achieve the goal or reward.

Based on the principles mentioned, cooperative learning has many benefits. For learners, it improves both academic and social skills. It also allows learners' decision making and creates active learning environment. For teachers, it is an aid to classroom management and instruction. Teachers can increase learning time and reduce learners' workload by teaching them to be responsible for their own learning and to help monitor one another's progress. This allows teachers to become a facilitator of learners' learning process (Orlich et al., 1998).

In recent empirical studies, the effects of cooperative learning activities have been examined, and the studies have indicated positive results for increased academic achievement. For instance, an individual student demonstrated increased academic success and increased social skills after completing cooperative learning group tasks (Stahl, 1994). The success of cooperative groups is documented in lower and middle elementary grades as well as in college students (Soja & Huerta, 2001). It is also found that structured tasks promote better retention and that higher-level cooperative tasks promote higher-level thinking (Gillies & Ashman, 1998).

In another study conducted by Boling and Robinson (1999), three types of learning were compared: students learned individually as in traditional instruction, with interactive multimedia, and with cooperative learning. The aim of the study was to examine which activity best supplemented lecture-based distance education. The research findings revealed that traditional instruction was less effective than either interactive multimedia or cooperative learning.

In a Thai educational setting, Kwangsawad (2005) reports that cooperative learning encouraged his students to become more responsible and more actively involved in the learning process. The majority of students seem to be more satisfied with their new roles of active learners, and they liked this friendly and cooperative learning atmosphere. In addition, cooperative learning could also lower the students' anxiety in the way that it allowed the teacher to use various forms of assessment instead of using only tests. However, there were some students who were not satisfied with cooperative learning because they thought that it was not fair to place the responsibility of the weaker students on them, and some students were

afraid that the members of the group may not work well and adversely affect their shared grade.

In general, group work should become meaningful to learners in the way that they "understand how to do better together than they could do alone." They should also understand that by working thoughtfully with others, "they are learning how to think more clearly than in situations when they must work alone" (Wegerif & Dawes, 2004: 59).

Most recently, new technologies have added an exciting new dimension to collaborative and cooperative learning. With the Internet, collaborative and cooperative learning can occur without regard to distance or time barriers: e-mails can be sent at learners' or teachers' convenience to practically anywhere around the world, and the recipients can reply when they have time. Learners can work together to create Web pages or find and share data gleaned from the Net. This shows how technology can be used with cooperative learning.

Cooperative learning is one of the major characteristic of the use of WebQuests (March, 1998). WebQuests foster cooperative learning in the way that they are concerned with complex topics, and many of the questions or problems posed in WebQuests (especially long-term ones) are difficult to answer; thus, it is unrealistic to expect individual learners to complete each step of the process or to master all that has to be learned. Rather, learners have to cooperate and take on specific role within a cooperative group in order to complete the complex task (Marco, 2002). According to Fiedler (2002), the WebQuest instructional strategy combines desirable characteristics of both interactive multimedia and cooperative learning. This is a good opportunity for learners to learn to work with others, and by working together, learners can be encouraged to examine issues from various perspectives.

It can be seen that cooperative learning is an essential aspect of WebQuests which can enhance task accomplishment. However, groups do not work effectively without guidance. That is, usually many Thai students have not been taught how to work effectively in groups. Thus, the instructor plays a critical role in helping students manage group dynamics by facilitating and monitoring group

interactions. In this study, prior to the implementation of WebQuest modules, the students will be trained on how to manage group dynamics and accomplish the task in cooperation with others. It is essential for them to feel comfortable with cooperative learning and to have positive group work experience.

2.5.3 The advantages of WebQuests

WebQuests have been widely used as an instructional tool due to many advantages. First, WebQuests have potential for authenticity. By reading the information from the Web, learners have unlimited opportunities to access authentic language (Murray & McPherson, 2004). In addition, since authenticity of the learning tasks seems to be the instructors' central concern, WebQuests can also promote authenticity in the sense that they have to understand or solve the real world issues by using the information drawn from authentic materials. Consequently, it can be said that WebQuests give learners opportunities to involve in authentic communication through engagement with real tasks (Davis, 2003).

Second, WebQuests promote learners' motivation. Along with having authentic tasks to complete comes the idea that if learners are given some control in the learning process, they will take more responsibility for it and will thus be more motivated. Many WebQuest tasks are designed to address problems or issues that exist in the real world, and this leads learners to have greater motivation (March, 1998). Also, learners get to work with real resources. Instead of finding the information from the textbook, learners can be exposed and gather information from a variety of resources on the Internet. According to Marco (2002), WebQuests are considered as activities specially suited to ESP language learning in the way that learners perform a real world task using authentic materials related to their academic discipline.

Third, WebQuests are often cooperative in nature; learners learn to work cooperatively to accomplish the task. With WebQuests, learners take on roles within a small group. Cooperative learning strategies are then applied when each learner's input is important to accomplish the group task. Besides, learners will be able to see different solutions from different groups; thus, they will be aware that their

individual work has a direct impact of the quality on their group's final product (March, 1998).

In terms of cooperative learning, Lara and Reparaz (2005) conducted a research analyzing the effectiveness of cooperative learning fostered by working with WebQuests. The investigation was conducted with a group of 24 students (16 years old) in their fourth year of Obligatory Secondary Education at Erain School. Students had to work in groups of three to produce a scientific video on the Geography of Guipuzcoa. To do the task, a WebQuest was created by the instructor to offer guidelines on how to make this scientific video for the students. The results obtained from the questionnaire indicated that the use of a WebQuest helped group members in their investigation work and in the production of their videos. Besides, the students had positively valued this way of working as they stated that this task was entertaining, attractive, and motivating as opposed to the traditional paper-based assignment.

Fourth, WebQuests develop thinking skills (Marco, 2002). The questions posed to students require more than just finding information and copying the answers. Rather, learners must take the information they research and transform it into something else (March, 1998). Often learners have to evaluate a variety of information sources from the Web selected by the teachers. Then they have to analyze, synthesize, and come up with their own solutions or perspectives to solve the problem. Dodge (1995) states that a WebQuest activity might require learners to use these thinking skills: comparing, classifying, generalizing, or analyzing information from different perspectives.

Moreover, Warchauer (2002) notes that language education should pay attention to both product and process in teaching and learning. To achieve these two critical goals, a WebQuest task can assist the language learning process in the sense that learners must work together, brainstorm for the ideas, examine sources of information, and reach a consensus in order to come up with the required product.

Since there is a trend to bring about learner-centeredness which enables the learners to take more active and participatory role in their learning process, WebQuests have the ability to integrate online resources with learner-centered learning (Vanguri et al., 2004). Learning is, undeniably, the shared responsibility of

the teacher and the learners. While learners are encouraged to search for the important information they need, the teacher, as a facilitator, will provide them with the guidelines to help clarify what they have to do and give assistance during the learning process. Therefore, a WebQuest is an example aimed at helping the learners gain confidence in their own learning ability to make them become more independent learners.

Lamb and Teclehaimanot (2005) note that the most successful web-based learning experiences are those in which the teacher acts as a facilitator, paying careful attention to the learners and guiding them through critical stages of their inquiry projects. The role of the learners are changed as well. They are expected to involve in the active learning process: planning for completing the assigned tasks, organizing ideas, exploring and evaluating information, analyzing and synthesizing data, and communicating findings and conclusions. Marco (2002) states that such activity helps learners develop critical reading and synthesis skills.

March (2003) also contends that another potential of the WebQuest is that not only are learners the ones who gain benefit from their use, but teachers also gain in-process, professional developments and experiences of a truly learning-centered practice when they facilitate the implementation of well-designed WebQuests and share their experiences with others. However, despite the fast growth of computer networks around the world, many English language teachers in Thailand are still unfamiliar with the use of technology in their classroom activities (March, 1998 cited in Davis, 2003).

2.5.4 Related research

Although there are still some concerns about the computer technology in terms of Internet-based or Web-based instruction including WebQuests to enhance learning achievement, WebQuests have been widely utilized in educational settings owing to its accepted advantages. This is mirrored by a number of research findings revealing the empirical evidence concerning the implementation of WebQuests in enhancing learning achievement in many subject areas. For example, Burke et al. (2003) conducted a research study with 19 sections of 365 students to investigate the

effectiveness of the WebQuests modules of Biology 101 developed by the Division of Biology and the University of Tennessee Instructional Technologies Collaborative (ITC). The researchers compared the WebQuest inquiry-driven approach with the traditional demonstration laboratories. Eight sections were randomly selected to have laboratories centered on the WebQuest modules, while the other 11 sections participated in traditional demonstration. Results indicated that the average score for "WebQuest" sections was higher than that of the traditional sections and the average final exam score of all "WebQuest" sections was higher than the average score of the traditional demonstration sections. According to the surveys, the students reported having a positive experience in the WebQuest lab sections. Most students indicated that they would like to be in a similar WebQuest lab section again, and they would recommend it to other students. They also reported that it was preferable to a traditional lab section class. Additionally, the general consensus of the lab instructors was that the students in the WebQuest lab sections demonstrated more interest in the topics studied and they also found the class materials more engaging. Finally, the researchers claimed that their qualitative assessments of the success of the WebQuest modules were sufficiently positive to inspire them to adopt WebQuests and other problem-based activities to teach Biology in the following 2003-2004 academic year.

There is also evidence of positive perceptions of the use of WebQuests. Leite, McNulty, and Brooks (2005) carried out an experiment on the implementation of WebQuests with students in a rural high school. The researchers developed the WebQuests for the teachers and designed the details of the WebQuest activity for teaching social studies (history). Although the findings revealed that the pretest and posttest scores between the two groups were not significantly different, the qualitative data from the interviews suggested clearly that both teachers and students were satisfied with the WebQuests.

Compared with traditional classroom, WebQuests were perceived positively by the students in the study of Lara and Reparaz (2005) who analyzed the effectiveness of cooperative learning fostered by working with WebQuests. The investigation was carried out with a group of 24 students (16 years old) in their fourth year of Obligatory Secondary Education at Erain School. Students had to

work in groups of three to produce a scientific video on the Geography of Guipuzcoa. To complete the task, a WebQuest was created by the instructor to offer guidelines on how to make this scientific video for the students. The results obtained from the questionnaire indicated that the use of a WebQuest helped group members in their investigation work and in the production of their videos. Besides, the students positively valued this way of working as they stated that this task was entertaining, attractive, and motivating as opposed to the traditional paper-based assignment.

The impacts of WebQuests on students' positive perceptions were also reported by Murray (2006). In his study, Murray found that the participants of the research generally had positive attitudes toward the use of WebQuest lessons. Most of them preferred WebQuest activity to textbooks and lectures. His findings also suggested a link between the task difficulty and the motivation to complete the WebQuest task. It was evident that some students were willing to work harder to better understand the reading materials. Similar research results of positive perceptions of students were also found in a study of Tsai (2006), in which students' preferences of WebQuests were reported.

There have also been attempts to use WebQuests to teach subject contents. The study conducted by Strickland (2005), for example, was aimed at comparing the use of WebQuests to teach content with traditional instruction. The students in the control group consisted of 18 males and 20 females who studied with a poster activity, while those in the experimental group consisted of 24 males and 24 females who studied with a WebQuest on the Texas Revolution. Both of the activities were implemented as additional enhancement to close the teaching units. The test was administered at the end of the unit, and the scores were then compared. The results revealed that the scores of the control group were higher than those of the experimental group. It was also found that traditional classroom activities of creating unique posters were effective for teaching and reinforcing large amounts of content. One plausible explanation was that the students in the experimental group may not be interested in the topic of the WebQuest. Additionally, it may also be possible that using the Internet to learn may not be motivating to these students since most of them already had Internet access.

There are also a number of research studies concerning the successful use of the Internet or WWW in a classroom. A study of Pratt and Sullivan (1994 cited in Prapphal, 2001) investigated the effects of computer networking on teaching ESL writing at the University of Puerto Rico**.** They compared two ESL writing classes taught with the same syllabus but under different conditions. One class of the students studied in a computer-networked classroom where virtually all class discussion was carried out electronically using the real-time communication software called Daedalus InterChange. The other class was conducted in a traditional classroom with oral discussion. They found that students in the computer-assisted class showed significantly greater gains in writing than did the students in the traditional class.

The effective use of WebQuests to enhance listening and reading skills has been revealed by Pala (2005) who reports on the construction and effectiveness of a web-based beginner, intermediate, and advanced level self-study activity package to improve listening and reading (L/R) skills in Turkish. A questionnaire was constructed and distributed to college students who, at the time, were taking self-study languages at a Pacific Northwest language institution. Questionnaire results were used as a needs analysis, and a web-based three-level L/R activity package was developed. The results indicated that, once students, especially advanced students, were provided with pedagogically and methodologically sound web-based receptive skill activities in Turkish, they found it more motivating to study the target language and thus learned better. The study concluded with the argument that incorporation of online L/R materials into language instruction is an effective way to increase learning outcomes

Research on WebQuests in reading instruction has shown the enhancement of students' reading performance through the use of WebQuests. The research study conducted by Tsai (2005) investigated the effect of EFL reading instruction by using a WebQuest learning module as a CAI enhancement on college students' reading performance and vocabulary acquisition in Taiwanese students when a WebQuest learning module as a computer-assisted instruction (CAI) was utilized to enhance the traditional EFL reading instruction. According to the study findings, the use of the WebQuest as a CAI enhancement produced a significant difference in students'

vocabulary acquisition and story reading performance. In addition, this study reported the positive relationship between student attitudes and student perceptions toward the use of the WebQuest module.

Not only can the use of computer technology enhance language learning in terms of reading instruction, a number of research findings suggest that integrating Web resources into EFL writing instruction, especially with the use of WebQuest model, is more effective to enhance students' writing performance and provide a positive learning experience. In a study of Chuo (2004), the effect of the WebQuest Writing Instruction (WWI) on EFL learners' writing performance, writing apprehension, and perception were investigated. The WWI was designed on the basis of a WebQuest model with the assumption that such a pedagogical model supported major learning and second language acquisition theories. This study also examined the relationship between students' perception and the change in their writing performance and writing apprehension over the instruction process. The experiment was done with students in two junior college second-year classes at a foreign language institute in Southern Taiwan. The control group (N = 52) received traditional classroom writing instruction, while the experimental group (N = 51) received the WWI. Both groups used the process writing approach over a 14-week period. Data collection included a writing performance test and a writing apprehension test administered to both group and a post-instruction perception questionnaire administered to the experimental group. The results showed that the WWI improved students' writing performance significantly more than the traditional writing instruction. The WWI class also manifested significant reduction of writing apprehension, even though there was no significant difference between the apprehension of the control group and the WWI class. Additionally, students revealed positive perception of the WWI indicating more advantages than disadvantages of language learning through web resources. Finally, there was no significant correlation between students' perception and their improved writing performance and no significant relationship between students' perception and their reduced writing apprehension. The findings led to the conclusion that integrating web resources into EFL writing instruction, using the WebQuest model, was

effective to enhance students' writing performance and provided positive writing experience.

Some cautions have been proposed when integrating technology into classroom practice. For example, the difficulties when introducing the new learning approach integrated with technology like WebQuest models might occur during the implementation stage. For instance, Davis (2003) conducted action research to examine the effectiveness of using a WebQuest to develop literacy competencies in second language learners of a private English college in Sydney. WebQuests lessons were developed and used over a three-month period with upper intermediate Chinese students in a preparatory class for entrance into the New South Wales educational system. These students came from teacher-centered environment, so the class was newly introduced to learner-centered education, cooperative learning, and group discussion, especially the reasons behind WebQuests. The qualitative data from the teacher's observation and reflection, as well as the information from questionnaires in Davis's study revealed that there were some difficulties in the learning process because the students had never encountered a WebQuest before. A large obstacle has also been reported when using WebQuests in an Asian context due to its constructivist structure (Davis, 2003). Constructivist educational theory supports the ideas of learner-centeredness with students having control over their own learning, but Davis has found that many Asian students are uncomfortable with this type of learning. His research findings revealed that Asian students are more accustomed to and prefer a teacher-centered classroom. He then suggests that it depends on the teacher to decide how to balance the use of WebQuests with the needs of students and to help these students adjust themselves to the new classroom experience. According to him, it might be best to start slowly and gradually working up to a full acceptance. He also confirms that just like any other tool in language instruction, WebQuests will be useful if it is used at the right place and at the right time.

Marco (2002) also points out that WebQuests have limitations that can cause some problems for some learners. They may feel overwhelmed by various reading texts from the Internet and they may lack the language proficiency needed to understand the texts which are not written specifically for language learners with limited proficiency. Therefore, the type of WebQuest task and the resources selected

for students should be suitable for their level of knowledge and language proficiency. In addition, when assigning students to work in groups, less proficient ones should be matched with more proficient students. In this way, they can help each other learn. Another interesting suggestion given by Marco is that the teacher should simplify the task rather than simplify the authentic texts.

Although some research studies do not show highly positive evidence on the implementation of Web-based instruction and WebQuest models, it cannot be denied that most research studies on Web-based instruction strongly recommend and encourage language teachers to exploit the usefulness of computer technology, especially the Internet and the WWW which are considered a wealth of authentic information available online. In addition, some research studies show evidence on the success of the integration of technology into classroom practice which can yield a lot of achievement in language learning. Although a few studies on WebQuest instruction have been conducted in the ESL and EFL contexts, research has revealed the effective use of WebQuest to enhance students' learning in reading and writing instruction. The findings show that WebQuest lessons help students learn better and increase their learning outcomes. However, there is little empirical evidence of the effect of the implementation of WebQuests in language instruction on student achievement. Therefore, such findings can be the rationale for the present research study which attempts to develop WebQuests modules for students in the Thai EFL context and to seek empirical evidence on the effectiveness of the use of these modules in terms of enhancement of English reading and writing abilities and students' learning engagement.

2.6 Reading and writing ability enhancement

2.6.1 Reading ability and reading instruction

"Reading, as is true of all aspects of language knowledge and use, is complex, and the development of fluent reading abilities by L2 students is challenging and undertaking" (Carrell & Grabe, 2002: 242). In L2 settings, there has been an increasing recognition that reading abilities are critical for academic learning, and researchers have attempted to find empirical evidence on what can

affect and facilitate L2 reading abilities. One of the central issues in second language reading research is the issue on L2 vocabulary and reading development. Several researchers have examined the issue of how much vocabulary is necessary for L2 learning. Laufer (1989) found that reading fluency requires that a reader know 95% or more of the words encountered in a text for minimal comprehension. In another study, Hu and Nation (1992) point out that a reader needs a vocabulary size of about 500-word families in order to achieve 97-98% of text coverage. Moreover, Droop and Verhoeven (2003) report a strong relationship between vocabulary knowledge and later reading ability as well.

Based on research findings, Carrell and Grabe (2002) have drawn instructional implications for L2 reading instruction that, in order for L2 learners to read well, they must have an adequate size of vocabulary and must be able to recognize the words in that vocabulary quickly and accurately. Guessing from context and dictionary use can help acquire vocabulary, but these skills are not automatic. Rather, they need to be developed and practiced in order to be used effectively in conjunction with reading.

Another issue in L2 reading research that has gained much attention is the role of background knowledge in reading. Many researchers agree that background knowledge plays an important role in reading comprehension. Carrell and Grabe (2002) cite many research findings which have demonstrated that the background knowledge appears to provide strong support for reading comprehension in many contexts (e.g. Pritcchard, 1990; Carrell & Wise, 1998).

The issue concerning reading strategies is also vital in reading instruction. These strategies are used to solve problems encountered in constructing meaning. They range from bottom-up vocabulary strategies, such as looking up an unknown vocabulary in the dictionary, to more comprehensive action, such as connecting what is being read to readers' background knowledge. Research results have also demonstrated that strategy use in more proficient readers and less proficient readers is different. Reading strategies can help improve learner performance on tests of comprehension and recall (Pearson & Fielding, 1991 cited in Janzen, 2002).

The issue of promoting extensive reading in a reading class is also widely recognized. The major characteristics of extensive reading are that learners read

large amounts of materials, choose what they want to read, read within their level of comprehension, and usually take part in post-reading activities like summary writing or book review, with teachers and learners simultaneously keeping track of learner progress (Renandya & Jacobs, 2002). A number of studies have investigated the impact of extensive reading on second language reading. Hafiz and Tudor (1989), for example, found evidence that an extensive reading program led to a significant improvement in ESL reading and writing.Grabe (2004) has concluded the instructional implications for reading instruction from reading research, which can be viewed as component abilities of learners that need to be developed for effective reading comprehension. The implications are as follows:

1. Ensure word recognition fluency
2. Emphasize vocabulary learning and create a vocabulary-rich environment
3. Activate background knowledge in appropriate ways
4. Ensure effective language knowledge and general comprehension skills
5. Teach text structures and discourse organization
6. Promote strategic reader rather than teach individual strategies
7. Building reading fluency and rate
8. Promote extensive reading
9. Develop intrinsic motivation for reading
10. Plan a coherent curriculum for student learning

(Grabe, 2004: 46)

It is worth noting that research findings can help researchers look for reliable evidence in support of instructional practices in order to minimize the negative consequences and adopt more effective ways to help learners develop reading skills. However, Grabe (2004: 60) cautions that “research studies do not guarantee such benefits, but they represent important ways to test instructional practices and search for more effective outcomes. The ideal for effective reading instruction, then, is a merging of practitioner knowledge and persuasive research support. Both are needed for effective instruction.”

Fry (1994 cited in Flippo, 2001) has contributed an insight for teaching reading. He believes that what teacher can do is to move learners beyond what they

are able to do. Put another way, teachers should also try to move all learners ahead, the brightest and the dullest ones alike. Furthermore, teachers should have great latitude in selecting methods, and no major method should be totally forbidden. A variety of methods recommended by him are the following: "(a) match student ability to book difficulty (readability), (b) give lots of reading practice in both narrative and expository texts, (c) teach vocabulary-high frequency words and roots, (d) teach phonics, (e) teach comprehension, (f) develop writing ability, and (g) give student success, praise and love" (p. 17).

2.6.2 Writing ability and writing instruction

Richards and Renandya (2002) note that writing is usually viewed as the most difficult skill for L2 learners to master. The difficulty involves not only in generating and organizing ideas, but also in translating these ideas into readable texts. The skills involved in writing are very complex. They include both higher level skills of planning and organizing and low level skills of spelling, punctuation, and others. Writing is even more difficult for L2 learners if they have weak language proficiency.

The process writing has become a widespread instructional approach. The process approach is seen as a major improvement over a traditional method of writing instruction, or the product approach. The process writing is described as a four-stage process: pre-writing, drafting, revising, and editing (Tribble, 1996). The product approach, on the other hand, focuses only a final piece of writing which is measured by the criteria of vocabulary use, grammatical use, and mechanical considerations such as spelling and punctuation as well as content and organization (Brown, 1994), hence drawing strong criticisms on its effectiveness. The process approach emphasizes the revision process and also feedback from others. This leads to involving learners more in the self- and peer-assessment processes. It should be noted that process writing is not a linear one that a writer can start with prewriting, then rewriting, and then more rewriting. Instead, writing is a continuous process that is recursive in nature. That is, writers can go back and forth all through the process.

Leeds (2003) suggests that a writing teacher should always keep in mind that "writing is an act of thought: thinking as we write and then thinking again as we

review our material for deeper insight and greater clarity" (p. 82). Thus, writing involves the thinking and rethinking process.

In 1992, the National Assessment of Educational Progress (NAEP) administered a writing assessment to a representative national sample of approximately 7,000 fourth-grade students, 11,000 eighth-grade students, and 11,500 12th-grade students from about 1,500 public and private schools across the country. The NAEP assessed student ability by asking them to write to inform others about a topic (interactive writing), to write an essay to convince others of their point of view (persuasive writing), and to write about personal experiences (narrative writing). Students were asked to respond to two writing tasks and provided with blank paper to plan their writing. Then they were asked how frequently teachers encouraged them to plan their writing, define their purposes for writing, and write more than one draft and revise. Students, teachers, and administrators in all three grades were also asked about instructional content and practices. It was found that several process-writing techniques were associated with higher writing proficiency. First, students of teachers who always encouraged planning and defining purposes and audience were found to be generally better writers than students of teachers who reportedly never encouraged these activities. Second, average writing ability was higher among students whose teachers emphasized more than one process-writing strategy. It was also found out that the use of prewriting was associated with the highest average proficiency scores (National Assessment of Educational Progress, 1998). With regard to the NAEP findings, the process-oriented writing instruction has become adopted.

2.6.3 Trends in teaching writing

Apart form the adoption of the process-oriented writing instruction, it is noteworthy that a number of promising trends emerged during the 1990s (Gillespie, 2005).

The first current trend is project-based instruction. In project-based instruction, writing often plays a central role. There are several reasons to support teaching writing through project-based instruction. For example, "a classroom

project, when well-planned, is a good way to motivate students to write because it offers opportunity to match tasks with interesting topics that are relevant to students" (Tessema, 2005: 23). Project-based instruction encourages collaborative learning and the involvement of students in writing (and reading) in authentic and purposeful contexts. Its focus on purposeful learning can direct teachers away from teacher-assigned writing activities with little relationship to everyday life and toward authentic writing tasks derived from needs at work, within the family, and in community life (Gillespie, 2005).

Another promising trend is innovative use of technology. At present, learners are surfing the Web to research areas that interest them, communicate through e-mail, create Web pages, and form on-line groups of various kinds. They can find audiences to read and respond to their texts. Also, they can combine visual and print literacy to communicate their ideas, and they can form long-distance collaborations with others. In addition, a wide range of web sites now have links to resources by and for learners. Some contains discussion forums for language learners in particular and has provided the means for them to become pen pals with other learners from around the world. Some programs also publish their curriculum materials and teaching tips on-line. Research studies on the use of computers for teaching reading and writing reveal that computer-based instruction facilitates learners' reading and writing abilities. These results should encourage ESL and EFL teachers to use computers in classroom not because they are new technology, but rather because they bring positive results to learners' achievement.

2.6.4 Conclusion

It can be concluded that WebQuests are a combination between project-based instruction and innovative use of technology for language teaching and learning. WebQuests provide opportunities for learners to be exposed to a variety of authentic texts from the Internet related to a specific topic and the task/project. Learners gather information, work cooperatively, and do the writing tasks or projects. For learners who are engaged in workplace-related or academic Web work, finding reliable information on the Internet is considered a real-life task (Healey,

1999). As there are a lot of attempts to look for ways to make reading and writing a more communicative and authentic learning experience for language learners, WebQuests can then be utilized by teachers who wish to make an effective use of technology to achieve these goals (Egbert & Handson-Smith, 1999).

With respect to the review of literature, the process-oriented writing instruction is considered appropriate for teaching writing skills along with the WebQuest modules in this study. Process writing will be taught to students explicitly. There are four basic stages of process writing as a classroom activity: "planning (pre-writing), drafting (writing), revising (redrafting), and editing–and three other stages externally imposed on students by the teacher, namely, responding (sharing), evaluating, and post writing" (Seow, 2002). (See more information in Appendix on the WebQuest lesson plan.) The task or project is carefully selected and designed to ensure students' interest. The innovative use of technology will be used to support student learning in terms of providing background knowledge for gathering information from reading, providing opportunities for students to practice online exercises, practicing using online dictionaries, making use of spelling checker programs, etc. The application of computer programs can be very useful to process writing, especially for the purpose of drafting, revising, and editing. Teachers can demonstrate to students the revision or editing part via computers and save their work for later revision (Seow, 2002).

2.7 Course evaluation and WebQuest course evaluation

Evaluation is considered as "the heart of the systematic approach to language curriculum design" (Brown 1995: 217). In the course or program development, needs analysis has firstly been conducted, and then the overall goals have to be translated into instructional objectives. Once a needs analysis has been completed and a program has been designed, the process of course development is still not over because the course (outcome) must be evaluated to gain useful feedback indicated specific areas in need of additional attention and improvement, and provided invaluable guidance for revising and updating the course (Poel, 2009).

Different scholars defined the term "evaluation" differently. Hutchinson & Waters (1987: 97) define "evaluation" as "a matching process, which concerns

matching learners' needs to available solutions." According to Hull (1996: 2), course or program evaluation refers to "the thoughtful process of focusing on questions and topics of concern, collecting appropriate information for a specific use and purpose." Brown (1995: 218) defines program evaluation as "the systematic collection and analysis of all relevant information necessary to promote the improvement of a curriculum and to assess its effectiveness within the context of a particular institutions involved."

Based on the definition given by Brown (1995), in this study, course evaluation is referred to as a systematic means to collect and analyze relevant information necessary for improving the quality of the developed teaching materials, instructional plan, and instruction of a specified course, and for assessing its effectiveness within a specific setting.

According to Brown (2003), program evaluation is a sort of ongoing process. Once the program or curriculum has been developed, it should never be viewed as a product. Since professional experience, teaching concepts, and methodological knowledge are constantly changing, teachers should be open to making necessary changes on what can or should be modified, added, or changed to make the course reflect students' interests and needs (Sysoyey, 2000). The evaluation information allows the course or program to be changed and adapted to any new conditions that may arise (Brown, 2003).

Course or program evaluation can be implemented in one of the two ways, either summative or formative evaluation (Hull, 1996: 200). Formative evaluation is the process of evaluating any aspect of a course as it is being developed and implemented for the purposes of improving it. Summative evaluation is carried out once the course is over, or a stage of the course is over, for the purposes of evaluating the effectiveness of the course, primarily in meeting its stated goals and objectives within the scope of the curriculum. The results of summative evaluation can determine whether a course should be continued.

According to Sysoyey (2000), evaluation can be done in two different ways: implicitly and explicitly. Implicit evaluation takes place during the semester, when learners, by their grades, participation, and motivation, give clues to the teacher on how their learning is going on. Explicit evaluation may take place at the end of the

course or after students have experienced it. Using questionnaires, surveys, talks, etc., teachers ask the students to express their attitude towards the subject matter, instructional methods, activities, the teacher's roles and so on.

Peol (2009) proposes that evaluation can be integrated in the learning process. He has found out that the reasons that many teachers are not willing to evaluate the course and their instruction may be that conducting evaluations will draw time and attention away from the course content. In his case study, an evaluation process has been integrated into a writing program for tertiary language students at the University of Antwerp. The findings show that several mechanisms for feedback and evaluation can be incorporated into course materials with minimal impact and with greater benefits of evaluation as both a validation process and a guide for course revision.

Graves (2000) has pointed out that the success of a course is judged by what students learn, and what they feel they have learned. To confirm the success of the evaluated course, systematic evaluation is needed. As for any systematic evaluation, it involves the use of formalized lists of criteria. Although checklists for course evaluation exist in plenty, such evaluation criteria are usually context-dependent (Sysoyey, 2000). Sheldon (1988) states that the quality of the evaluation depends on the ability to ask the right questions in a specific context. Simply put, one evaluation may not be directly applicable in other contexts. Therefore, those who desire to use these available sources may need to make an adjustment to the checklists to suit their own context so that the results of the evaluation would be of quality.

Taylor-Powell, Steele, and Douglah, (1996: 2) suggest that to enhance the value of information gained from an evaluation, one should devote sufficient forethought and planning to the evaluation process. They have designed a guide for planning a program evaluation which is organized into four major sections: focusing the evaluation, collecting the information, using the information, and managing the evaluation.

To conclude, course evaluation is the last, but not the least, important stage. The major purposes of course evaluation are to find out the strengths and weaknesses of the course for improving the developed course, and to find the

effectiveness of the implemented course, through the systematic ways of data collection and analysis. Additionally, to plan for an effective evaluation, the following questions should be asked and answered: (1) what is the purpose of the evaluation? and (2) who will use the evaluation? How will they use it? Although "there is no blueprint or recipe for conducting a good evaluation" (Taylor-Powell, Steele and Douglah, 1996: 2), an effective systematic evaluation could be conducted if well-planned.

Currently, there are many WebQuest lessons that have been created by teachers, students, and others on the Internet. Some of them are considered good and others are not. It is absolutely essential that a WebQuest lesson be evaluated before deciding to use it with educators or students (Johnson & Zufall, 2000). Most of the teachers are using evaluation rubrics for WebQuest lessons at "The WebQuest Page" of Dr. Bernie Dodge, who has provided "A Rubric for Evaluating WebQuests" (Original WebQuest Rubric by Bernie Dodge: Version 1.03. Modified by Laura Bellofatto, Nick Bohl, Mike Casey, Marsha Krill, and Bernie Dodge and last updated on June 19, 2001, from http://webquest.sdsu.edu/webquestrubric.html), and Dodge asserts that the WebQuest evaluation format can be applied to a variety of teaching situations. This proposed format includes the evaluation of the following aspects:

1. Overall Aesthetics: overall visual appeal, navigation and flow, and mechanical aspects
2. Introduction: motivational effectiveness of introduction, and cognitive effectiveness of the introduction
3. Task: connection of task to standards, cognitive level of the task
4. Process: clarity of process, scaffolding of process, and richness of process
5. Resources: relevance and quantity of resources, as well as quality of resources
6. Evaluation**:** clarity of evaluation criteria

Some guidelines for WebQuest evaluation are also proposed by other scholars who advocate the use of WebQuest. For example, Johnson & Zufall (2000) suggest the guidelines written by Don Leu of the University of Connecticut.

Adapted for professional development, WebQuests can serve as an effective evaluation instrument. The questions in the guidelines include:

1. Does this WebQuest meet my goals and learning objectives?
2. How much time will this take and is this time well spent or could I accomplish more in less time with a different learning experience?
3. Does the WebQuest require me to think critically about information and evaluate the information I encounter?
4. Is this WebQuest developed so as to accommodate my individual learning needs and interests?
5. Is there an opportunity for me to share the results of my WebQuest with other educators?
6. Are all of the links on the WebQuest active and appropriate?

Deutsch (2004) summarizes how March (2003) defines a quality WebQuest as follows: WebQuests are more than just activities which utilize the Internet. Students must experience both individual and team learning, and produce an authentic end product that is creative and applicable to real life. WebQuests must be "real, rich, and relevant" (March, 2003: 45). Through student teamwork, cooperation and collaboration, students learn to access information and "use the acquired information and expertise in a new way" (March, 2003: 46). This leads students to use their higher thinking skills for a "deeper understanding" and more independent learning. As a result, they become more responsible for their own learning.

With regard to organization and scaffolding, a quality WebQuest must be well organized, and scaffolding should be sufficiently provided so that students have clear guidelines on what to do. In addition, it must have thought-provoking questions in the task that clearly lead to independent and critical higher order thinking.

As WebQuest foster cooperative learning, a quality WebQuest should clearly state in the process how the team members' tasks are divided. Each team member has a role for which he or she is responsible.

An evaluation rubric is another important component of WebQuest lessons. A quality WebQuest must have an evaluation rubric for each stage, not only for the end product. Some elements of the evaluation might include whether students present their work in a creative and interesting manner, and whether they use multimedia and other visual aids.

As Brown (1995) mentions, the course or program evaluation is conducted for a particular purpose and within a particular educational context. It should be noted that a lack of evaluation aspects that reflect the pedagogical issues that surround such Web-based learning can be noticed in the aforementioned WebQuest evaluation rubrics (Wui & Saat, 2008). This implies that those who desire to utilize the already-made rubrics may need to adapt or add certain aspects to cover their specific educational purposes.

The purpose of the present study was to develop WebQuest modules based on the course objectives of an existing curriculum for the purpose of enhancing reading and writing abilities specified in the objectives of the "Technical English" course. The purpose of the evaluation of the developed WebQuest modules was to determine whether the quality of these instructional modules matched the targeted language needs and the students' learning needs.

In terms of the evaluation procedure in this study, two main steps were involved: first, evaluating WebQest materials, and second, assessing the effectiveness of the WebQuests after implementing them in the main study. The first stage concerns with the evaluation of the developed WebQuest modules as teaching materials. The results of the evaluation were used to improve the quality of the product. This was done before the implementation of the WebQuest modules in the experiment. The experts in the field of English language instruction were asked to evaluate and give comments and suggestions on these instructional materials in terms of the relevance, quality, and appropriateness. The rubrics used for the evaluation of Webuest modules in the present study were adapted from those proposed by Dodge (2002). The data obtained were used to ensure the content validity of the instrument as well as to adjust the materials before their actual use in the main study. A pilot study was also conducted; the WebQuest lessons were evaluated by asking the participants to keep their logs on what they liked and

disliked about the WebQuests, and what should be improved. The results were used to revise the WebQuset modules accordingly.

The second stage of the evaluation was done after the developed WebQuest modules were implemented in the main study. The aim of the evaluation was to assess the effectiveness of the WebQuest learning course. The evaluation was conducted along with the experiment in this study. The results of the evaluation were obtained from the assessment of students' language ability, their learning engagement, and their perceptions of the learning modules.

In conclusion, the WebQeust course evaluation was a critical stage of this research study. To ensure a fine-quality instructional material, the developed WebQuest modules must undergo a process of evaluation to ensure the content validity before it could be used in the main study. After the developed WebQuest lessons were implemented, the evaluation was conducted in order to assess the course effectiveness. As for the effectiveness of the course, the reading and writing achievement tests were employed. Qualitative evaluation was also utilized through the use of students' learning logs, semi-structured interviews, and the teacher's diary.

2.8 Students' learning engagement

By integrating Web-based instruction into language classrooms, educators generally create learning environment that requires active student involvement (Stoller, 2002). Regarding the underlying principle of a WebQuest model based on the constructivist theory of learning, the learning activities are designed to bring engaging technology-based learning experience to the students. In the learning process, learners will construct knowledge of the target language on their own while being engaged in meaningful activities. According to Biter and Legacy (2006), engaging learning is tied closely to constructivist principles as it is believed that learners learn best when they are active participants in the learning process. That is, they make their own decision, think critically about their own learning problems or resources, and operate in a meaningful context.

2.8.1 Engagement theory

The vast majority of the literature on students' learning engagement comes from the Information and Communication Technology (ICT) in education (Aldred, 2004). Aldred explains that it may be because of the need to engage learners at a distance with the courseware. When learners are remote, it is necessary to find ways that engage them and make them want to concentrate on their studies.

In 1999, Greg Kearsley and Ben Shneiderman developed a framework for engaging learners in technology-based teaching which is called the engagement theory (Kearsley & Shneiderman, 1999). This theory has emerged from their experiences teaching in electronic and distance education environments. They explain that the fundamental idea underlying the engagement theory is that learners must be meaningfully engaged in learning activities through interaction with others and the tasks. This means that all learner activities must involve active cognitive processes such as creating, problem-solving, reasoning, decision-making, and evaluation. In addition, learners are intrinsically motivated to learn due to the meaningful nature of learning environment and activities.

Kearsley and Shneiderman (1999) also suggest that, in order to be truly engaging, learning tasks should be project-based, occur in a group context or in collaborative teams, and have an outside authentic focus. In short, learning activities should be structured following the principle of "Relate-Create-Donate."

First, the "Relate" component emphasizes teamwork that involves communication, planning, management, and social skills. When learners work in teams, they often have opportunity to work with others from quite different backgrounds. This facilitates an understanding of diversity and multiple perspectives. Secondly, "Create" means making learning a creative, purposeful activity. Unlike traditional classroom, it is much more interesting for learners to conduct their own projects and to have a sense of control over their learning. It is believed that learners become engaged when they see meaning and purpose in what they are doing. Thirdly, the "Donate" principle stresses the value of making a useful contribution while learning. In conclusion, by asking learners to interact with a complex real-world problem or project, create a solution, and then donate that

solution back to the outside world, learners in Information Communication Technology learning environments will become more engaged in their learning process.

Unlike many older models of computer-based learning, the emphasis of the engagement theory is on individualized instruction and interactivity. This theory does promote interaction, but it is human interaction in the context of group activities, not individual interaction with an instructional program. The latter form of interaction is usually assessed by single responses by mouse clicks, whereas engagement requires assessment for larger units of work such as reports. Kearsley and Shneiderman (1999) conclude that "the difference between engagement and interactivity reflects the shift in thinking about computers in education as communication tools rather than media delivery devices. Furthermore, engagement theory places a great deal of emphasis on providing an authentic (i.e. meaningful) setting for learning, something not present in previous models" (p. 3).

To accomplish engagement, learners must be engaged in their course work in order for effective learning to take place by following these three primary means: (1) an emphasis on cooperative/collaborative efforts, (2) project-based assignments, and (3) authentic focus. It is suggested that these three methods result in learning that is creative, meaningful, and authentic. In the process of learning, the role of technology is to facilitate all aspects of engagement in the sense that the vast resources of information from the WWW enable students to design, plan, problem-solve, and make presentation of the assigned complex tasks. Therefore, technology provides learning environment that fosters the kind of creativity and communication needed to enhance engagement (Kearsley & Shneiderman, 1999).

In the field of K-12 education, the North Central Regional Laboratory (NCREL) has proposed an engaging learning model and indicators of engaging learning. In this model, learners are viewed as strategic, responsible, and energized by learning; tasks have to be challenging, authentic, and interdisciplinary; problem-based instruction and performance-based assessment are required; learning contexts are to provide collaborative and knowledge building context; grouping should be heterogeneous; teachers act as facilitators and co-learners; and learners are viewed

as explorers and producers of knowledge (Andris, 2001). The NCREL's engaging learning model has some common grounds to aspects of learning engagement proposed in the engagement theory of Kearsley and Shneiderman in that both models emphasize the aspect of problem-based instruction, the authentic and meaningful task, as well as cooperative/collaborative learning.

With regard to those three major aspects required to accomplish engagement, WebQuests are considered as an example of high quality Web-based learning activities that is deemed very engaging (Aldred, 2004). Andris (2001) states that WebQuests are good examples of engaging learning activities as they combines engaging learning with clear structure. The important feature of a WebQuest is a doable and motivating task that requires learners to work cooperatively in a group with distinct roles, the process section that provides clear directions for solving the problem without identifying solutions, the resource section that provides pre-selected websites relevant to the task, and the evaluation part with given rubrics for self-assess their written product (Andris, 2001). More importantly, the WebQuest model also views teachers as facilitators and learners as active participants in the process of learning.

It can be seen that WebQuests are well-designed to facilitate student engagement through problem-based learning activities that require the active participants to be exposed to a wide range of authentic texts from the Internet, as well as to work cooperatively and collaboratively to develop possible solutions. The learners are motivated to be engaged in authentic and meaningful learning activities which are current events or events related to their academic disciplines. Apart from the attempt to develop engaging learning materials based on WebQuest models, the teacher also needs to ensure that learners are engaged in the learning activities and they actively participate in the process of learning.

2.8.2 Defining learning engagement

Before seeking for ways to assess learning engagement, it is necessary to be precise on what it means to be engaged in learning.

There have been various definitions of student engagement appeared in the literature. Student engagement is frequently used to depict learners' willingness to participate in routine school activities, such as attending class, submitting required work, and following teacher's directions in class (Chapman, 2001). Skinner and Belmont (1993) differentiate learners who are engaged and not engaged in learning activities as follows:

> [Learners] who are engaged show sustained behavioral involvement in learning activities accompanied by a positive emotional tone. They select tasks at the border of their competencies, initiate action when given the opportunity, and exert intense effort and concentration in the implementation of learning tasks; they show generally positive emotions during ongoing action, including enthusiasm, optimism, curiosity, and interest. The opposite of engagement is disaffection. Disaffected learners are passive, do not try hard, and give up easily in the face of challenges... [They] can be bored, depressed, anxious, or even angry about their presence in the classroom; they can be withdrawn from learning opportunities, or even rebellious toward teachers and classmates" (Skinner & Belmont, 1993: 572 cited in Chapman, 2001).

From this overview, student engagement includes both behavioral and affective aspects. In terms of behavioral engagement, class participation, on-task behavior, and academically oriented extracurricular activities have been the focus of research found in the literature (e.g. Connell 1990, Finn, 1989). As for affective engagement, the focus is on the level of student investment in, and their emotional reactions or attitudes toward the learning tasks (Chapman, 2003).

Another major aspect of student engagement is cognitive engagement. Different definitions of this concept have been found in research studies. For example, Lutz, Guthrie and Davis (2005:10) define cognitive engagement as encompassing mental investment in learning and effortful strategy in the instructional process. According to Chapman (2003), cognitive engagement refers to the extent to which students are attending to and expending mental effort in the

learning tasks encountered, including efforts to integrate new materials with previous knowledge and to monitor and guide task comprehension through the use of cognitive and meta-cognitive strategies. Valentine et al. (2003) develop a broad definition of cognitive engagement as "the mental effort that individuals actively use to focus on tasks that lead to learning" (p.1).

Besides, different aspects of cognitive engagement have been investigated by different researchers. For example, to investigate student cognitive engagement, Biggs (1987) relate cognitive engagement to approaches of learning. The three approaches to learning has been identified and used as constructs of cognitive engagement: surface, deep and achieving. Based on Biggs (1987), in a study of Kong & Wong &Lam (2003), the researcher found that the students' learning strategies were closely related to cognitive engagement. Thus, the dimensions of student cognitive engagement were proposed as follows:

Table 2.1: Dimensions of Cognitive engagement (Kong & Wong &Lam (2003:10)

Surface strategy	Deep strategy	Reliance
Memorization Practicing Handling tests	Understanding the question Summarizing what is learned Connecting new knowledge with the old ways of learning	Relying on parents Relying on teachers

Similarly, the use of cognitive and meta-cognitive strategies is used to indicate student cognitive engagement in a study of Meece, Blumefield, and Hoyle (1988, cited in Chapman, 2003:3). Examples of the active task engagement items include "I went back over things they didn't understand", or "I tried to figure out how today's work fit with what I had learned before". An example of the use of shallow strategies which indicate low level of cognitive engagement is "I skipped the hard parts". Cunningham & Cunningham (2002) also investigated student engagement by looking to learning skills and strategies employed by the learners.

They asserted that "Engaged learners work in a motivated way—that is, they employ whatever skills and strategies they have with effort, persistence, and an expectation of success" (p.89).

Taking many different ways in defining the concept of student engagement, the research found that a broad definition of the terms might be useful to scope the conceptual framework for investigating students' learning engagement while doing the WebQuest activities in terms of "the mental effort that individuals actively use to focus on tasks that lead to learning", followed Valentine et al. (2003). With the attempt to shift the learners' roles to become more active, the indicators of students' mental effort will be identified by their use of surface and deep strategies in their learning process.

2.8.3 Criteria for evaluating learning engagement

Chapman (2003) proposes the following three interrelated criteria to assess learning engagement levels—cognitive, behavioral, and affective criteria, based on which the students in the present study will be assessed:

1. Behavioral criteria, which index the extent to which students are making active responses to the learning tasks presented. The criteria include active student responding to an instructional process, such as asking and answering questions, solving task-related problems, contributing to group discussions, and participating in class discussions with teachers/peers.
2. Affective criteria, which index the level of students' investment in, and their emotional reactions to, the learning tasks. The criteria include levels of interest, anxiety, and feeling toward success in the learning tasks.
3. Cognitive criteria, which index the extent to which students are attending to and expending mental effort in the learning tasks encountered, including efforts to integrate new materials with

previous knowledge and to monitor and guide task comprehension through the use of cognitive and meta-cognitive strategies.

2.8.4 Conclusion

In this study, the researcher will examine student engagement in terms of student active involvement and participation in the learning tasks and learning process, as well as their positive emotional reactions toward the tasks and the integration of technology in the classroom environment. Students' learning engagement is categorized according to the cognitive, affective, and behavioral engagement indices which will be used as criteria for assessing the level of engagement of the students in this study.

As the implementation of WebQuest modules is a new learning experience for the students in this study, they will be encouraged to be engaged in the learning activities. Students will be informed in advance how they should play the role of active learners, what they are required to do in the learning process to be engaged learners, and what benefits they will gain from such learning. The characteristics of engaging learning based on the students' learning engagement index will be discussed so that students will be clear on their roles as active learners.

Owing to advanced computer technology, many educators have attempted to work in specific ways to bring an engaging learning approach or model into traditional classroom settings, placing its emphasis on collaborative and project-oriented student work and teachers' facilitation. Andris (2001) notes that the lack of an engaging learning model is one of the barriers to incorporating existing technology in the language classrooms. Therefore, this research study will also examine the level of students' learning engagement when implementing the WebQuest modules specially designed to bring technology-based engaging learning experience into the language teaching and learning setting in a Thai context.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research methodology employed in the present study. The main objectives of the study are to develop the WebQuest modules to enhance students' English reading and writing abilities, to investigate the effectiveness of the modules to enhance students' reading and writing abilities as well as student engagement, and to examine students' perceptions of the implementation of the WebQuest modules. In this chapter, the description covers research design, participants, and research instruments for each stage of the research together with methods of data collection and data analysis.

3.2 Research design

This study was quasi-experimental research. The design of the research was one-group pretest/posttest design, as illustrated in Table 3.1. The experiment was conducted with the aim to evaluate the difference that the treatment, the implementation of the WebQuest modules, made on one group of subjects before and after exposure to it.

Table 3.1: One-group pretest-posttest research design

Pretest	Treatment	Posttest
T1	X	T2

From Table 3.1, T1 represents the pretest administered to a single group before the exposure to the experimental treatment, X refers to the experimental treatment, and T2 means the posttest administered to the subjects after the treatment to determine whether there is a significant difference (Issac & Michael, 1982). In

this study, the T1 was the reading and writing pretests, the X represented the implementation of the WebQuest modules, the T2 was the reading and writing posttests. Before the experiment, the participants of the study were asked to do the reading and writing pretests. Then the WebQuest modules were implemented for one semester of 14 weeks. After that, the reading and writing posttests were administered. Finally, the gained scores obtained from the pretest and posttest were compared to see whether the difference is significant. The results were used to determine the effectiveness of the treatment. Apart from the quantitative data obtained from the test scores, qualitative data was also collected to determine the effectiveness of the implemented treatment. This type of data was collected from the students' learning logs, the teacher's diary, and a semi-structured interview.

Population

The population of this study included 285 second-year undergraduate engineering students who were enrolled in Technical English course, at Rajamangala University of Technology Pra Nakhon, North Bangkok Campus, in the academic year 2008

Participants

The participants of the study were an intact group of 40 second-year RMUTP engineering students who are enrolled in the "Technical English I" course in the first semester of the academic year 2008. They were all male students majoring in Electrical engineering. They all passed the fundamental English courses in their first year. It is worth noting here that the subjects were not randomly selected because they were allocated into a class due to the university's administration policy and were used as an intact group in this study.

3.3 Research Procedure

The research procedures in this study consist of three phases: the development of the WebQuest modules, the implementation of the WebQuest modules, and the evaluation of the effectiveness of the WebQuest modules. Table 3.2 illustrates the research procedures and the steps taken in this study.

Table 3.2: A summary of research procedures in the study

Research procedures and steps to be taken in this study
Phase 1: The development of the WebQuest instructional modules **Step 1:** Reviewing related learning theories and principles 1. Web-based instruction 2. WebQuest instructional strategy 3. Constructivist theory 4. Cooperative learning principles 5. Theory of engagement 6. Approaches in reading and writing instruction **Step 2:** Developing principles of the instructional model in accordance with the objectives of the course **Step 3:** Developing the instructional modules and designing lesson plans
Phase 2: The implementation of the WebQuest modules **Step 1:** Planning Stage: developing research instruments, validating and piloting the instruments 1. Developing research instruments • Reading and writing tests • Student engagement self-rating questionnaire • Student log • Semi-structure protocol 2. Validating and piloting the instruments **Step 2:** Conducting the main study and collecting the data (Data collection) 1. Administering the pretests (Reading &writing test, Engagement questionnaire) 2. Implementing the treatment (Students' logs, teacher's diary) 3. Administering posttest (Reading &writing test, Engagement questionnaire) 4. Conducting a semi-structured interview

Phase 3: The evaluation of the effectiveness of the WebQuest modules (Data analysis)

Step 1: Analyzing students' achievement regarding reading and writing abilities

Step 2: Analyzing the level of student engagement

Step 3: Analyzing students' perceptions of the WebQuest implementation

3.3.1 Phase 1: Development of the WebQuest modules

The development of WebQuest instructional modules started were based on four major stages. The results obtained were then employed for answering the first research question of this study: How can the WebQuest modules be developed?

Stage 1: Reviewing related theories and principles

The researcher reviewed related literature regarding the integration of technology in education and language learning, theories and principles underlying the WebQuest strategy, as well as teaching approaches for enhancing reading and writing abilities. Then the learning theories and principles were analyzed and synthesized to be used as key concepts underlying the development of WebQuest modules for the enhancement of students' reading and writing skills.

Stage 2: Developing principles of the WebQuest instructional model

At this stage, the researcher employed the key concepts drawn from the analyzed and synthesized learning theories and principles to formulate the principles for the WebQuest instructional model for the enhancement of students' reading and writing skills in Technical English course.

Stage 3: Developing WebQuest instructional modules and designing lesson plans

Based on the formulated principles for the WebQuest instructional model, the modules were developed and the teaching steps for the WebQuest implementation were determined.

Developing WebQuest instructional modules

This stage is dedicated to the development of the WebQuest modules for the "Technical English" course at Rajamangala University of Technology Phra Nakhon, North Bangkok Campus. This course is currently offered based on themes in general science and technology. The course focuses on essential academic reading and writing skills, with little attention paid to the speaking and listening skills.

In the content of "Technical English I" course, there are altogether five units. Therefore, five units of the WebQuest modules will be developed and implemented for the whole semester. These five WebQuest modules will be developed according to the course objectives of each unit. The process of the development will be based on Dodge's critical attributes of WebQuests (Dodge, 1995) and March's WebQuest design processes (March, 1998).

As previously mentioned, the "Technical English I" course has to adhere to the course description and objectives specified by RMUTP, the WebQuest modules will therefore have to be designed based on such description and objectives, which are as follows:

Course description: Practice in the four language skills emphasizing reading for main ideas and details, vocabulary development, sentence and paragraph writing, listening for main points, and basic oral communication for everyday life

Course objectives: By the end of the course, students should be able to do the following:

- use reading strategies to read passages concerning academic disciplines and to identify main ideas and details from the reading texts;
- identify and summarize main points from listening passages;
- write grammatical sentences and short paragraphs;

- use English to communicate in different career situations via speaking and listening

It is noteworthy at the Rajmangala University of Technology Phra Nakhon, North Bangkok Campus, listening and speaking skills are separately taught in the language lab for one hour each week. The other two hours focus only on development of reading and writing skills, which, in this study, reading and writing skills were taught through the implementation of WebQuests.

As WebQuests are a type of web-based materials which have specific elements called "critical attributes," the structure of the WebQuest modules used in this study will follow these critical attributes which include an **introduction** that sets the stages of the activity, a **task** that is doable and interesting, a clear **process** including guidance or scaffolding, an **evaluation** part providing rubrics for students to self-evaluate their written product, and a **conclusion** that provides reflection and closure.

WebQuests modules were created by downloading "a WebQuest template". The steps in the WebQuest design process proposed by Dodge (1998) were followed. The first step was the design job for the content of the WebQuests in terms of designing interesting tasks, assigning clear roles for students so that everyone takes part in task completion, finding relevant and appropriate resources links, providing enough guidance or suitable scaffolding to help students in the learning process, creating rubrics for evaluating students' writing product, and writing lesson plans for teaching these WebQuests. A summary of the steps taken for developing the WebQuest modules in this study was presented in Table 3.3.

Table 3.3: Steps in developing the WebQuest modules (based on Dodge, 1999)

The process of Dodge's WebQuest	Steps in developing WebQuest modules
1.Select a topic appropriate for WebQuests	• Study the course objectives • Select a topic appropriate for WebQuests • Write up the task (expected outcomes)
2.Select resources	• Find and select the resources • Describe how learners will be evaluated • Design the rubrics for Evaluation section
3.Describe how learners will be evaluated	• Describe how learners will be evaluated • Design the rubrics for Evaluation section
4.Design the process	• Design the process (Provide resources and scaffold where needed)
5.Complete the WebQuest	• Complete the rest of the WebQuest parts (Introduction, Conclusion, and Credits section and all other parts) • Write down the lesson plan • Select appropriate learning activities to serve the learning objectives

After finishing the development of WebQuest units, the lesson plans were written to specify the steps in implementing the WebQuest modules in the experiment.

Designing the lesson plans

At this stage, the lesson plans were written to specify the steps of WebQuest instruction. The steps of teaching were based on the WebQuest parts and approaches to teaching reading comprehension and process writing. Therefore, when

implementing the WebQuest lessons of this study, the teaching plans were designed to provide clear steps of reading and writing instruction.

There were two major stages of implementing the WebQuest modules. The first one concerns the reading session consisting 3 steps: pre-reading, reading and post-reading stage. Then the steps in teaching writing was followed. It included the steps of pre-writing, writing (planning, drafting, revising and editing) and post-writing stage. A summary of the teaching steps in the lesson plans was presented in Table 3.4.

Table 3.4: A summary of the teaching steps in the lesson plans

Parts of the WebQuest	Steps of teaching	Purposes
INTRODUCTION (to gain students' attention and introduce the topic)	**Pre-reading phase**	• to introduce the activity • to activate students' background knowledge • to pre-teach vocabulary • to pre-teach grammar structures
TASK (doable and interesting)		• to set the purposes for reading • to assign student' role
PROCESS (to provide step-by-step instructions, resources and guidance for students in order to complete the task)	**Reading phase**	• to provide reading practice and feedback opportunities for students
	Post-reading phase/ Pre-writing phase Writing phase (Planning, drafting, revising, editing)	• to check reading comprehension and skill mastery • to discuss difficulties & problems students encountered while reading • to help student compile and analyze the information • to prepare the language needed for writing
	Writing phase (Planning, drafting, revising, editing)	• to complete the task
EVALUATION (to provide rubrics on how the task will be evaluated)	**Post-writing phase**	• to evaluate the task • to give feedback and suggestions on students' tasks
CONCLUSION (to bring closure to the activity or extend the gained knowledge to other domains)		• to draw a conclusion from the task • to provide connections to other subject areas or events to promote retention and transfer of knowledge

After the WebQuest modules had been developed, these modules together with the lesson plans were validated by a panel of three experts in order to assure the quality of the research instruments. The experts were asked to rate their evaluation in a provided Research Instrument Evaluation form. The form was divided into two parts. In the first part, the experts were asked to indicate what they thought about the modules by rating appropriate (+1), not sure (0), or not appropriate (-1) for each of the items provided. There were five items altogether. As for the second part, which was open-ended, the experts were asked to give their additional comments and suggestions for the improvement of the modules.

The experts' responses in the first part of the evaluation form were calculated using IOC (Item-Objective Congruence Index) to determine the validity of the model. The acceptable value of IOC for each item should not be lower than 0.5, otherwise the item needs to be revised.

It was found that the IOC value of the validation result was 0.78 and two out of three experts agreed on each item. Based on this result, the modules were considered acceptable. However, some adjustment had been done according to the comments and suggestions by the experts (e.g. animated pictures should be added to motivate the students and there were some broken links needed to be replaced).

3.3.2 Phase 2: The implementation of the WebQuest modules

Step 1: Planning Stage: developing research instruments, validating and piloting the instruments

1. Developing research instruments: This stage concerned with the development of research instruments. They included the reading and writing pretest and posttest, student engagement self-rating questionnaire, students' log, teacher's diary, and semi-structure protocol.

1.1 Reading comprehension test

The reading test was developed by the researcher based on the course objectives. It is used as the pre- and post-tests in this study. The pre-test was administered to assess students' reading comprehension ability before the experiment. After finishing the implementation of the WebQuest modules, the same

test, used as the post-test, were administered once again. The results from the pre-test and post-test were then compared to assess the differences in their reading ability to determine if the implementation of WebQuests resulted in any improvement in students' reading achievement. The development of the reading test was carried out according to these steps: defining the test construct, writing a table of specification, and writing the test.

The construct of the test was specified based on the Douglas framework (2000) and the course objectives. According to Brown (2004), the first task in designing a test was to define the test construct according to the appropriate test objectives. According to the course objectives, students' reading ability required could be concluded to be the objectives of the test which were to measure:

1. Ability to recognize the meaning of basic technical terms and non-technical vocabulary used in the field of engineering
2. Ability to comprehend the reading text in the following areas:
    2.1 Ability to skim the texts for main ideas
    2.2 Ability to scan the texts for specific information
    2.3 Ability to make inferences from the information in the text
    2.4 Ability to guess word meanings from context

After defining the test construct, the test specification was written. The table of specification was used to provide the test writer with the basis for a selection of test items. It specified what type of input was used, how many items were included, what duration was allowed for each part, and the type of test items. A comparison of test specification and test content was the basis for judgments of content validity.

In this research study, the reading test consisted of two subtests including vocabulary and reading comprehension.

Part 1: Vocabulary (including non-technical words and basic technical terms related to engineering: vocabulary which is considered as fundamental concepts for all engineering students, selected.)

Part 2: Reading comprehension (including main idea items, specific details items, inference items, and fact items)

The criteria to select the vocabulary and the reading text were taken into consideration. For vocabulary, ten basic technical terms related to engineering and ten non-technical words were randomly selected from the vocabulary list from each unit decided by the staffs of RMUTP. In this skill area, students were also asked to use appropriate strategies to determine the meaning of unknown words from context clues. The clues were presented in a directly-stated phrase, in sentences prior to or after the use of the target words, or may be found through a careful reading of the entire text.

In terms of the reading passages and the topics, the passages were texts and passages based on general science and technology related to engineering taken from printed materials and from the Internet. The length of the passages was approximately 400-500 words.

To ensure the content validity of the test, the test was validated and evaluated by three experts (one in the field of assessment and two English teachers with a doctoral degree and experiences in teaching English for Engineering). The experts were asked to validate and evaluate the test by completing the evaluation form for the Experts to Validate the English Reading Test. The experts' responses were calculated using IOC (Item-Objective Congruence Index) to determine the validity of the model. The acceptable value of IOC for each item should not be lower than 0.5, otherwise the item needs to be revised.

1.2 English writing test

In this study, two types of writing test were used in this research study: direct and indirect tests. The indirect type of writing test used in this study consisted of 20 items of error detecting test, selecting the part of a sentence that contains an error from four options. The indirect writing measure attempted to assess writing ability by testing a subset of skills assumed to constitute components of writing ability in a sentence level. As Grabe and Kaplan (1996) indicate, indirect writing measures have been accepted as potential measures of writing ability and

they produce a strong reliability statistics when the tests are carefully developed and appropriately used to assess the students' writing ability in sentence level.

Another type of writing test was direct assessment which was used to measure students' writing ability. In this research study, the students were asked to write paragraphs according to the prompt given. When using the direct writing test, an appropriate scoring process was needed. In this study, the analytic scoring rubric was used. The reason for using analytic scales was that it provided detailed criterion which could lead to positive feedback in which students had clear study goals. Analytic scoring used separate scales that allow assessment to be more objective and consistent. Each scale was for assessing a different aspect of writing. The ratings in this study were for content, organization, vocabulary, grammar, and mechanics. The mentioned analytic scoring rubrics were adapted from the scoring guides of Jacobs et al. (1981) as Grabe and Kaplan (1996) suggest that "these scales are well supported by content and construct validity, they have field-tested, and they are designed specifically for classroom use rather than for large scale assessment" (p. 409).

The first part of the writing test consists of 20 items of error detecting test requiring students to select an error out of the four underlined parts of a sentence. In the second part, the topic of direct writing test was based on the topic that the students had studied in their WebQuest modules. Therefore, the students had background knowledge for their writing.

The participants' writing was assessed regarding the five criteria in the rating scales: content, organization, vocabulary, grammar, and mechanics. Clear specification of scoring criteria in advance of administering essay questions can contribute to improve reliability and validity of the assessment (Linn & Gronlund, 2000). As the students in this study have studied with the WebQuests, so they were expected to be familiar with this kind of assessment.

1.3 Teacher's diary

The teacher will write the diary after teaching the students in each week. The data obtained are concerned with the teacher's reflections of the new teaching experience and the observation of student learning. Opinions on other classroom situations were also recorded. The data from the teacher's diary were

analyzed qualitatively using categorization so as to triangulate the findings from the quantitative data collection procedures.

1.4 Students' learning logs

The data concerning the students' perceptions of the use of WebQuest modules were obtained from the students' learning logs. Students were asked to keep their learning logs after the implementation of each unit of the lesson. In order to ensure comprehensiveness and usefulness of the data from the learning logs, a guideline, which has already been approved by a panel of three experts in terms of clarity and language appropriateness, were provided to the students. The items included in the guideline mainly concern the students' perceptions of the implementation of the WebQuest modules (opinion on usefulness, level of difficulty, and their preference in using these WebQuests). They were also encouraged to express their opinions freely in the logs.

1.5 Students' learning engagement rating scale questionnaire

The data concerning students' learning engagement was obtained from the students' leaning engagement rating scale questionnaire developed by the researcher based on the concept of learning engagement of Chapman (2001). The students were asked to do the questionnaire after the implementation of each WebQuest module in order to identify their own level of engagement during the learning process. The questionnaire was in the form self-administered rating scales covering three main criteria for evaluating student engagement: affective, behavioral, and cognitive indices.

1.6 Semi-structured interview

A semi-structured interview protocol was constructed by the researcher to elicit data regarding their learning engagement and perceptions of the WebQuest modules concerning the following aspects: the usefulness of WebQuest modules, the level of difficulty, their preference for the use of these WebQuest modules in classrooms with respect to reading and writing skill development, the use of authentic texts from the Internet, the use of scaffoldings, and the use of

cooperative learning. The research objectives were translated into interview questions.

1. Validating and piloting the research instruments

2.1 Validating the instruments

In validating each of the instruments, the evaluation forms were provided for the experts to rate their views about the instruments as appropriate (+1), not sure (0), or not appropriate, based on points for consideration provided. Each evaluation form for each instrument also provided a space where the experts can write down their comments and suggestions. The research instruments were adjusted and/or revised according to the experts' comments and suggestions before employing in the pilot and the main study.

(1) Reading and Writing tests

The reading and writing achievement tests was validated by the experts in order to ensure its validity. The results of the test validation revealed the grand mean of IOC value at 0.88 and two out of three experts agreed on each item. Two out of the three rated it appropriate for assessing the students' reading comprehension ability and their writing achievement. Similarly, the scoring rubrics were acceptable. One of the expert commented that the direct writing test should not be the same for pretest and posttest because the students might be able to remember it. Thus, the researcher adjusted this part accordingly.

(2) Self-rating engagement questionnaire, students' log, teacher's diary, semi-structured interview protocol

These research instruments were validated by the experts who are university English instructors with doctoral degree in the field of EFL and English education. The three experts approved the appropriateness of these instruments both in terms of the language used and the content. However, there were some suggestions for students' logs. Two experts suggested that the researcher should use a self-rating perception questionnaire instead of using students' logs because students might not give sufficient information for answering the research questions. Taking this suggestion into consideration, the researcher discussed this issue with the experts that her intention was to obtain the data on what the students really felt

about the treatment. After the discussion, the experts approved for the use of students' logs.

The result of the validation of self-rating engagement questionnaire, students' log, teacher's diary, semi-structured interview protocol yielded the IOC (Index of Item-Objective Congruence) of 0.86, 0.88, 0.86, 0.82 respectively, meaning that the instruments were acceptable. However, one expert gave comments on the students' log that the researcher should ask students to specify the exact degree of the level of difficulty of the WebQuest modules.

2.2 Piloting the instruments

After the research instruments were validated and approved by the experts, the pilot study was conducted in order to find out about the degree of difficulty of the learning materials, the appropriateness of teaching procedures regarding the enhancement of reading and writing skills, and the time spent for the class activities. The pilot study was conducted during a summer course in the academic year 2008. The participants in the pilot study were a class of 28 students who were as similar as possible to the target population. They were second-year undergraduate engineering students at RMUTP North Bangkok. They were enrolled in Technical English course. They passed two fundamental English courses in their first years. In addition, the procedures of the pilot study also resembled those of the main study so that the researcher could predict the similar instructional situations and problems that might encounter in the main study.

The results of the pilot study revealed were beneficial for the improvement of the research instruments before being employed in the main study. It was found from the students' logs and interview that the participants enjoyed studying with WebQuest modules. Besides, they indicated that the introduction part was interesting, the use of the Internet motivated them to learn and the tasks were useful and not too difficult; the process were clear to them; the evaluating rubrics were difficult but useful.

As for the teaching procedures, most of the participants in the pilot study said that the teacher could help prepare students to read authentic texts from the Internet. They could practice a lot of reading and learned useful reading

strategies. They also found that the process of writing was helpful and they felt that the WebQuest lesson assisted them to improve reading and writing skills.

There were certain problems found in the pilot study. The first problem was insufficient time. Each WebQuest modules were planned to be taught in two weeks, two hours a week. When trying out the teaching, the students could not finish class activities within the class time. Some students were willing to read the texts before class. Therefore, the teachers gave the question handout to the students and asked them to find the information from the selected web links before the second module session. It was found that this could help them complete the task on time.

Second, some students felt frustrated because of too many difficult vocabulary words in the reading texts and some of them did not have enough background knowledge to cope with the new reading content. Accordingly, before letting the students read the texts on their own, the teacher had to be aware of the pre-reading stage and several activities to pre-teach necessary vocabulary had to be prepared.

Third, many students were not familiar using rubrics to evaluate their own writing task. Without the teacher help, they did not understand how to self-assess their work. Moreover, some students were not familiar with the new teaching style and their new roles in learning. To prepare for the main study, a session for preparing students to get familiar with the teaching and learning styles, modeling the steps in reading and writing as well as explaining how students perform the cooperative work.

As for the reading and writing achievement tests, the pilot of the tests was conducted to establish the test reliability and to determine the difficulty values and discrimination values. Fraenkel and Wallen (2000) stated that the satisfactory criterion for difficulty values range between 0.20 and 0.80, and that acceptable values for discrimination are more than 0.20. Based on the results from this pilot study, the difficulty values of the test ranged from 0.30 to 0.70, and the discrimination values were at more than 0.20. From these results, it can be concluded the reading test was an appropriate tool to discriminate good readers from poor ones. The results from the pilot study also showed that there were three test

items that did not meet the acceptable discrimination values (more than .80), so they were revised and retested. As for the test reliability, the reliability coefficient of the reading test should be at least 0.70 (Fraenkel and Wallen, 2000). In this pilot study, the reliability of the test was at 0.80. This indicated that the reading comprehension test was reliable according to the Kuder-Richardson Formula 20.

As for the writing test, apart from the content validity verified by the experts, inter-rater reliability was also examined. The two raters were trained to rated the students' writing. The raters reported the criteria were clear for both of them. In case that the rated score for each criteria was more than one mark different, they had to discuss and made the final judgment. The statistical calculation using Pearson correlation coefficient revealed that inter-rater reliability was 0.82 at the significant level of 0.05. This indicated that the scores obtained from the test given by the two raters had high correlation. Based on this statistical result, the test was considered reliable for the utilization in the main study.

With regard to the self-rating engagement questionnaire, it was tried out with 28 students who participated in the pilot study. It was found that the instrument was appropriate as the Cronbach's Alpha coefficient showed that reliability of the questionnaire was 0.89 at significant level of 0.05. Therefore, no item was modified or deleted.

Step 2: Conducting the main study and collecting the data (Data collection)

The main study was conducted with an intact group of 40 students in the first semester of the academic year 2009 at Rajamangala University of Technology Phra Nakhon, North Bangkok Campus. The implementation of the English instruction model was carried out once a week, from 9 a.m. to 11 a.m. every Wednesday. The semester lasted for 14 weeks. Totally, there were 28 hours. The first week was devoted to administering of reading and writing achievement pretests to measure students' reading and writing skills before implementing the WebQuest modules the treatment. The implementation of the WebQuest instructional modules started in the second week as an orientation session so that the students got acquainted to the new

teaching and learning styles. The course was always executed in the computer lab. The students chose their own group and they stayed with the same group for the whole semester.

As for the data collection, both quantitative and qualitative data was collected to evaluate the effectiveness of the developed WebQuest modules. Quantitative data was obtained from the reading and writing achievement tests and self-rating engagement. Qualitative data was obtained from students' logs, teacher's diary and semi-structured interview.

With regards to the quantitative data collection, the reading and writing achievement pretest was administered once before the implementation of the WebQuest modules. The reading and writing posttest was administered at the end of the course as the students' final exam. For reliability of the rating, the same two raters were used in both of the pre- and the post-test. The first rater was the researcher herself and the second rater was an experienced ESP teacher with a master's degree in TESOL at Rajamangala University of Technology Phra Nakhon.

Qualitative data was collected via students' logs, the teacher's diary and semi-structured interview for additional information into the study. Participants were asked to complete the student's log after finishing each WebQuest modules. The teacher completed the diary at the end of each class session. Twelve students were interviewed at the end of the course. The interviewer was a colleague teacher. She was asked to conduct this interview so that the participants could answer to the interview questions freely.

3.3.3 Phase 3: The evaluation of the effectiveness of the WebQuest modules (Data analysis)

Step 1: Analyzing students' achievement regarding reading and writing abilities

The mean scores of the reading pre-test and post-test of the students were compared and analyzed by using independent samples t-test with the significance level set at 0.05. Hedges'g effect size was also employed to measure the size of the effect caused by the experimental treatment.. The application of effect sizes in this study was to obtain the information to determine the effectiveness of the WebQuest

instructional modules in enhancing the students' English reading and writing abilities, particularly to find out whether the size of the effect was large enough to use as the indication of the effectiveness of the treatment. The effect sizes of .20 are considered small, .50 are medium, and .80 or above are large. The magnitude of the effect was expected to be at least = 0.5 which can be accepted as it indicates a medium effect size (Cohen, 1988).

Step 2: Analyzing the level of student engagement

The data concerning students' learning engagement obtained from self-rating engagement questionnaires were analyzed using descriptive statistics of percentage, mean, cv, and SD.

Step 3: Analyzing students' perceptions of the WebQuest implementation

The qualitative data concerning students' perceptions of the WebQuest modules obtained from students' logs, teacher's diary and semi-structure interview were analyzed using content analysis.

Lists of the research instruments used in the study are summarized in Table 3.5.

Table 3.5: The list of research instruments

Instruments	Purposes	Time of distribution	Validation	Statistics
1. Reading and writing pretest & posttest	To obtain students' English proficiency concerning their reading and writing skills	Before and after the treatment	By experts (IOC = 0.88) and inter-rater reliability at *0.82 (two raters was used for inter-rater reliability)	t-test to compare the means of the pre and post-test Effect-size using Hedges'g (aiming to achieve =0.5)

2. Student engagement questionnaire	To obtain information about the students' learning engagement	After the treatment	By experts (IOC = 0.86) and Cronbach's Alpha coefficient (0.89)	Descriptive statistics (frequency, mean, SD, CV)
3. Students' logs	To record how they feel, what they think about the lesson and their learning.	At the end of each learning module	By experts (IOC = 0.88)	Content analysis : coding, grouping, emerging theme
4. Teacher's diary	To record what is going on in the class.	At the end of each learning module	By experts (IOC = 0.88)	Content analysis : coding, grouping, emerging theme
5. Semi-structured interview	To obtain information about the participants' opinions toward the developed instructional modules	At the end of the course	By experts (IOC = 0.82)	Content analysis: categorizing, grouping, counting frequency

In conclusion, this chapter described research procedures of the present study. The procedures include three major phases: the development of the WebQuest modules, the module implementation, and the evaluation of the effectiveness of the instructional modules. The first phase deals with the processes of the WebQuest module development, while the second phase is the description of the implementation of the instructional modules. The last phase concerns the evaluation of the effectiveness of the developed WebQuest modules through the data analysis both quantitatively and qualitatively.

CHAPTER IV
RESEARCH FINDINGS

This research study was conducted to answer five research questions: (1) How can WebQuest modules be developed?, (2)What is the effect of the implementation of WebQuest modules on the students' reading ability?, (3) What is the effect of the implementation of WebQuest modules on the students' writing ability?, (4) What is the effect of the implementation of WebQuest modules on the students' learning engagement?, and (5) What are the students' perceptions of the implementation of WebQuest modules? In this chapter, the research findings are reported in accordance with each research question.

Research question 1: How can WebQuest modules be developed?

4.1 The development of the WebQuest modules

The WebQuest modules in this study were developed within the theoretical framework of WebQuest: the inquiry-based approach, constructivism theory, and the principles of cooperative learning, with some adaptation made to suit the students' need and interest. The following diagram illustrates all the steps of the WebQuest design process.

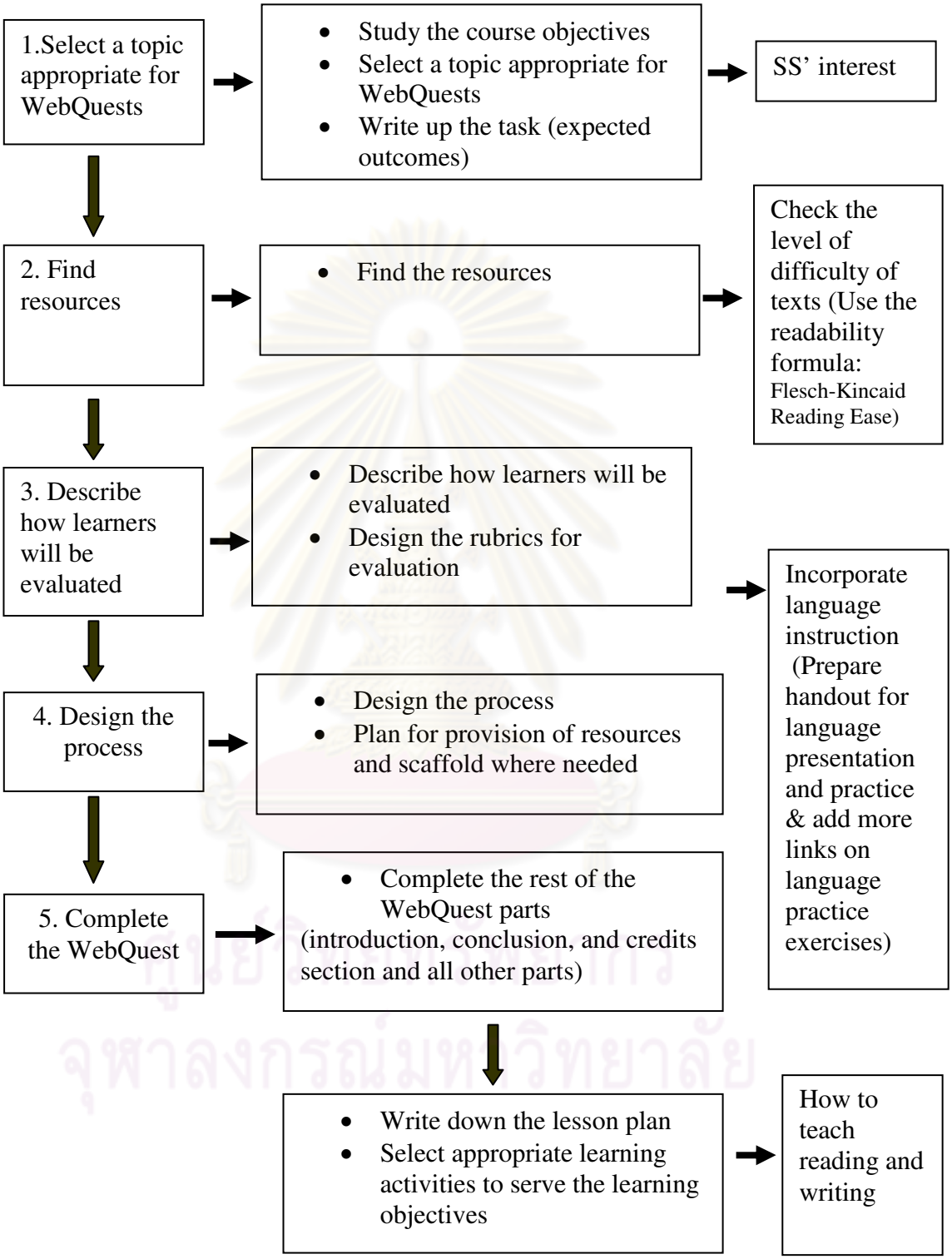

Figure 4.1: Steps in developing the WebQuest modules (based on Dodge, 1999)

4.1.1 Step 1: Select a topic appropriate for WebQuests

As illustrated in Figure 4.1, the steps in developing the WebQuest modules were based on the design process of the WebQuest original creator, Dodge (1999). In the present study, the researcher started from studying the objectives of the course and selecting appropriate topics for the modules within the theoretical framework of a WebQuest as reviewed in the literature**,** beginning with what the teacher would like our students to gain from WebQuest experience.

A mini survey was conducted. There were twenty topics proposed by the researcher; that is, four topic choices for each lesson unit. Twenty students and four English teachers were randomly chosen to do the survey. They were asked to rate the topics which they thought the most interesting and appropriate to learn in the Technical English" course. The top five interesting topics selected by the teacher and students were presented in Table 4.1.

Table 4.1: Topics of the WebQuest modules and lesson units from the textbook

Lesson units from the textbook	Topics of the WebQuest modules
Unit 1: Cause and effect	Module 1: Global warming crisis
Unit 2: Definitions and classification	Module 2: Transports of the future
Unit 3: Comparison and contrast	Module 3: Buying a new car
Unit 4: Giving instructions	Module 4: Recycling used materials
Unit 5: Describing a process	Module 5: Visiting a factory

After that, the tasks for each module were designed in accordance with the topics selected by the students. WebQuest tasks can be designed into many different types, but the tasks in this study were designed particularly to enhance students' reading and writing ability. Therefore, all the designed tasks were writing tasks based on the course objectives, as displayed in Table 4.2.

Table 4.2: The tasks designed for the selected topics and course objectives

Topics	Tasks
Global warming crisis	Create a brochure for a “reduce global warming crisis” campaign.
Transports of the future	Write an essay to define and classify the transports of the future.
Buying a new car	Write a report to compare and contrast the cars that the company should buy.
Recycling used materials	Create a brochure to persuade other students in the university to recycle used materials.
Visiting a factory	Write down the script to welcome a group of visitors visiting your factory and describe the process of making the company products.

4.1.2 Step 2: Select a design and resources

As stated in Chapter 3, reading comprehension problems can occur when the material is too difficult. One way to find out what level of material students can read is to use the readability formula. Moreover, there are hyperlink to many other texts with various levels of difficulty and length. To control the level of difficulty of the reading texts from online resources is not an easy job to do, but the readability formula can be used as a primary screening method to select reading materials that are not too difficult for students in order to prevent them from the overwhelmed feelings or frustration when they encounter many difficult texts.

With regard to the level of difficulty of the reading passages, in this study text readability was identified by means of Flesch-Kincaid Reading Ease. It is convenient to use the online readability calculator retrieved from http://www.onlineutility.org/english/readability_test_and_improve.jsp

Along with the use of the readability estimate, the researcher asked two English teachers to recheck the level of the text difficulty. A few resource links in the first module were suggested to be skipped as they might be too difficult for the students.

4.1.3 Step 3: Describe how learners will be evaluated

In this step, the researcher designed the evaluation page in the form of rubrics. This is to identify the criteria learners should meet when they self-evaluate their assigned task.

4.1.4 Step 4: Design the process

The process section usually explains the role of students and how the task can be accomplished step by step. In this part, it includes the resource links from the Internet and scaffolds. The Internet links were pre-selected not only for students to read and gather relevant information for the assigned task, but also for students to practice grammatical features necessary for each module. The participants can also practice these linguistic exercises at their own pace at home.

In this study, the researcher finds that the inclusion of language-focus instruction is a must. The crucial role of this explicit instruction is to provide linguistic help and a number of necessary learning strategies for the students to use in the learning process. In this step, the handouts for language presentation and practice were provided in order to prepare them in the reading and writing activities.

The first type of handout used in the pre-reading phase of every module is in the checklist. It was designed to activate students' background knowledge and pre-teach vocabulary and grammar structures necessary for the information gathering stage.

Other handouts included comprehension questions for the 'while reading' stage, the writing template for the writing stage, and a self-editing checklist for the writing process.

4.1.5 Step 5: Complete the module

This step deals with the completion of the WebQuest modules. It was done by compiling all the information prepared in the template step by step, starting with the introduction part, task, process, evaluation, and conclusion. After that, more animated pictures were added to make it interesting for learners.

After finishing the development of WebQuest units, the lesson plans were written to specify the steps in implementing the WebQuest modules in the experiment. The next part is about how the researcher developed the lesson plans.

4.2 The design of the instructional plan for the WEbQuest modules

Since the WebQuests were originally designed to teach content subject areas, when the WebQuest is used in language learning, especially in second or foreign language instruction, it can be a barrier and may cause frustration or discouragement for students (Perez Torres, 2006). Therefore, when implementing the WebQuest lessons of this study, the teaching plans were designed to provide clear steps of reading and writing instruction, as shown in Table 4.3**.**

Table 4.3: A summary of implementation processes of the WebQuest modules

Parts of the WebQuest	Steps of teaching	Purposes	Teaching & learning Procedure
INTRODUCTION (to gain students' attention and introduce the topic)	**Pre-reading phase**	• to introduce the activity • to activate students' background knowledge • to pre-teach vocabulary • to pre-teach grammar structures	1. T. asks questions from the Introduction 2. Ss respond and express ideas and share prior knowledge 3. T. tests Ss' background knowledge with a checklist of questions and presents vocabulary & grammar structure 4. Ss discuss and respond
TASK (to be doable and interesting)		• to set the purposes for reading • to assign student' role	1. T. explains the objective of the task 2. T gives lists of questions as guidelines for gathering information for the task 3. Ss assume their roles
PROCESS (to provide step-by-step instructions, resources and guidance for students in order to complete the task)	**Reading phase**	• to provide reading practice and feedback opportunities for students	1. Ss read the texts from Internet resources & gather important information based on the questions 2. T. monitors and gives help as Ss need

	Post-reading phase/ Pre-writing phase Writing phase (Planning, drafting, revising, editing)	• to check reading comprehension and skill mastery • to discuss difficulties & problems students encountered while reading • to help student compile and analyze the information • to prepare the language needed for writing	1. T checks Ss' comprehension & gives feedback 2. Ss share answer to the class & how to overcome problems they encounter while reading 3. T models compiling and analyzing information 4. T present writing model & ask Ss to identify theses statement and supporting details 5. Ss find answers and put them in the outline form 6. Ss practice write the gathered info. in their words
	Writing phase (Planning, drafting, revising, and editing)	• to complete the task	1.Ss plan their task, write a first draft, revise, and edit the work. 2. T monitors and give assistance when Ss need
EVALUATION (to provide rubrics on how the task will be evaluated)	**Post-writing phase**	• to evaluate the task • to give feedback and suggestions on students' tasks	1. Ss present their work to the class 2. Ss give their peers feedback through the use of rubrics
CONCLUSION (to bring closure to the activity or extend the gained knowledge to other domains)		• to draw a conclusion from the task • to provide connections to other subject areas or events to promote retention and transfer of knowledge	1. T leads Ss to discuss for conclusion of the activity 2. Ss express their thoughts

Research question 2: What is the effect of the integration of WebQuest modules on the students' reading ability, and what is the effect size?

4.3 Findings of Students' Reading Improvement

Participants were pre- and post-tested for their reading ability in terms of reading comprehension. The rater gave one mark for each correct multiple-choice item and the scores obtained were calculated with the SPSS program.

Hypothesis 1 was tested by performing a paired samples t-test and the results from the t-test are presented in Table 4.4

Table 4.4: Comparison of reading pretest and posttest scores using paired samples t-test and effect size (Hedges'g)

Reading Test	Mean	n	S.D.	Std. Error Mean	t-test	Sig. (one-tailed)	g
Pre-test	12.00	40	3.55	0.562	3.99	0.001	1.19
Post-test	16.52	40	4.05	0.641			

*p<0.05

From Table 4.4, the mean score of the reading pre-test was 12.00 and that of the post-test was 16.52. The standard deviations of the pre- and post-test were 3.55 and 4.05 respectively. The results indicated that participants in the study had higher scores in their reading comprehension post-test. The t-test analysis showed that there was a statistically significant difference between the reading pre-test and post-test at the level of .05. It was evident that the students' reading improved significantly with the effect size at 1.19, which is considered a large effect.

To gain further insight, effect sizes can be calculated to more precisely compare the differences between mean scores. The Hedges'g was used to calculate the effect size as this study used a single-group research design. An effect size of .20 is considered small, $\geq$.50 medium, and $\geq$ .80 large (Cohen, 1988). The calculated g's value was compared to the d's value of Cohen's d, and then the criteria were used to interpret how large the effect size was.

According to the data presented in Table 4.4, the effect size was quite large (g = 1.19 which equaled to d = 1.23) meaning that there was a positive effect on the improvement of students' reading performance after the implementation of the WebQuest modules. In other words there was significant improvement of the students' reading performances after the intervention. Thus, the first hypothesis of the study was accepted.

Research question 3: What is the effect of the integration of WebQuest modules on the students' writing ability, and what is the effect size?

4.4 Findings of Students' Writing Improvement

The students' writing improvement was determined by the gained scores from the writing achievement pre-test and post-test. Paired sample t-test was used to analyze the difference between the writing pre- and post-test scores. The value of the effect size was calculated. Hedge's effect size measure was employed. The results from the t-test are presented in Table 4.5.

Table 4.5: Comparison of writing pretest and posttest scores using paired samples t-test and effect size (Hedges'g)

Writing Test	Mean	n	S.D.	Std. Error Mean	t	Sig. (one-tailed)	g
Pre-test	5.63	40	2.42	0.382	8.18	.001	2.17
Post-test	12.20	40	3.52	0.557			

*p<0.05

Table 4.5 shows that the mean score of the writing post-test was higher than that of the pre-test, at 12.20 and 5.63, respectively. The result of the t-test was significantly different at the level of 0.05. It was found that the results showed a positive effect on students' writing performance as the participants improved their writing performance after the implementation of WebQuest modules. Further

calculation of the effect size to estimate the practicality significance of the results also indicated that the size of the experiment effect was rather large (g = 2.17 which equaled to d = 2.30). This showed that the treatment was truly useful for the enhancement of the students' writing ability. The second hypothesis was, therefore, accepted.

Research question 4: What is the effect of the integration of WebQuest modules on the students' learning engagement?

4.5 Findings of Students' Learning Engagement

Another dependent variable in this study was student engagement in the learning process when the WebQuest modules were used in the classroom. The purpose was to determine whether the use of WebQuests affected students' learning engagement. Put another way, the research aimed to determine if students' learning engagement in the learning process increased after using WebQuest activities in the instruction for one semester. The participants' learning engagement was examined in three dimensions of behavioral, affective, and cognitive aspects.

A Self-reported questionnaire was employed to obtain the data regarding behavioral, affective, and cognitive engagement. The same questionnaire was administered to the participants twice: at the beginning and end of the semester, in order to elicit information about their level of engagement before and after the instructional process. The three types of engagement were measured as students responded to the survey questions arranged on a four-point rating scale for behavioral engagement and a five point rating scale for affective and cognitive engagement.

4.5.1 Findings of Students' Behavioral Engagement

With regard to the behavioral engagement questionnaire, the participants were asked to rate the frequency of their behaviors during the learning process. In this questionnaire, there were three main groups of items. The first part consisting of items 1-2 were to indicate students' behavioral engagement in their class attendance, the second (items 3-9) to indicate their participation in whole class activities, and the last one (items 10-15) to rate their contribution to group work. The participants were

asked to rate their level of behavioral engagement in a four-point rating scale questionnaire. A response of 4 indicated that the student performed that behavior "very often," 3 signified "often," 2 for "sometimes," and 1 meant "never." The results of student behavioral engagement during the implementation of the WebQuest modules were analyzed using percentage, mean, standard deviations and C.V. (coefficient of variation) are presented in Table 4.6 (items 1-8) and Table 4.7 (items 9-15).

Table 4.6: Students' behavioral engagement (items 1-8)

Items 1-8	4	3	2	1	$\overline{X}$	S.D.	C.V.
1. I come to class.	97.5%	2.5%	-	-	3.98	0.16	4.02%
2. I come to class on time.	80%	20%	-	-	3.8	0.41	10.78%
3. I ask the teacher questions.	72.5%	12.5%	15%	-	3.58	0.75	20.94%
4. I ask my classmates questions.	85%	15%	-	-	3.85	.36	9.35%
5. I answer questions that the teacher asks.	97.5%	2.5%	-	-	3.98	.16	4.0%
6. I answer questions that my classmates ask.	67.5%	32.5%	-	-	3.68	.48	13.0%
7. I listen actively to the teacher.	90%	10%	-	-	3.90	.47	20.43%
8. I listen actively to my classmates.	50%	50%	-	-	3.50	.50	14.28%

According to Table 4.6, almost all of the participants (97.5%) attended the class regularly, and most of them came to class on time (80%). The data on items 3-8 seemed to suggest that the students' involvement in the whole class activities was quite high. This was indicated by the high frequency of students' asking and answering questions in WebQuest class participation; that is, all of the students reported that they "very often" and "often" asked questions and answered questions in class. In addition, the participants rated themselves as learners who actively listened to their teachers at a high level of frequency, and to their peers at a moderate level.

Table 4.7: Students' behavioral engagement (items 9-15)

Items 9-15	**4**	**3**	**2**	**1**	$\overline{X}$	**S.D.**	**C.V.**
9. I offer my opinions and ideas.	47.5%	52.5%	-	-	3.48	0.50	14.3%
10. I prepare the information needed for the group.	32.5%	67.5%	-	-	3.32	0.47	14.15%
11. I make comments.	17.5%	55%	25%	2.5%	2.88	0.72	25%
12. I respond to things someone else says.	15%	45%	37.5%	2.5%	2.73	0.75	27.47%
13. I ask questions when doing group work.	40%	57.5%	2.5%	-	3.38	0.54	15.97%
14. I clarify things someone else says.	12.5%	5.0%	82.5%	-	2.30	0.69	30%
15. I present the group task to the class.	15%	2.5%	27.5%	55%	1.76	1.07	60.79%

In terms of student engagement in group activities (Items 9-15), the students rated themselves as highly engaged when they were doing group work. It was evident that 100% of them contributed to group work by frequently offering their opinions (47.5% rated very often and 52.5 rated often), and by preparing information needed for the group (32.5% rated very often and 67.5 rated often). When looking at the mean scores, it was interesting to note that the data showed a high level of frequency for items 9-10, meaning that most students seemed to be highly engaged in group tasks by helping prepare information needed ($\overline{X}$ = 3.32) and offering opinions ($\overline{X}$ = 3.48), whereas the low level of frequency was found in items 11 and 14 which were about making comments ($\overline{X}$ = 2.88) and clarifying things someone else says ($\overline{X}$ = 2.30).

The coefficient of variations provided more evidence that the majority of the subjects performed many aspects of behavioral engagement more or less the same (ranging at about 15%), while the remaining aspects showed the percentage of score dispersion ranged from 25 to 30, which was not very wide. Except for the last aspect concerning group task presentation, the results showed a high percentage of CV (60.79%) meaning that the students' responses varied considerably. This may be due to the fact that the more able students were more likely chosen to be the presenters.

To conclude, most of the students reported high level of their behavioral engagement when studying with the WebQuest modules. The attended class regularly, listened to what the teacher taught attentively, asked and answered questions relating to the lessons more often. More importantly, they indicated that they contributed to the group activities.

4.5.2 Findings of Students' Affective Engagement

The affective engagement of the participants was examined in order to obtain the data on how they felt about their class (items 1-4), the teacher (items 5-8), group members (items 9-12), and the WebQuest activities (items 13-20). The level of the students' agreement was rated employing a five-point Likert scale where 5 meant strongly agree, 4 meant agree, 3 meant neutral/moderate, 2 meant disagree and 1 meant strongly disagree. The analysis of the data was based on these certain ranges of intensity, i.e. 1.00-1.50 for the lowest degree, 1.51-2.50 for low degree, 2.51-3.50 for a moderate degree, 3.51-4.50 for a high degree, and 4.51-5.00 for the highest degree. Such ranges were used to explain the level of agreement (from the least to the most) with each of the statements regarding affective engagement. The following are the data obtained from the self-rating engagement questionnaire on affective engagement using percentage, mean, standard deviations and C.V. (coefficient of variation).

Table 4.8: Students' affective engagement (items 1-4)

Items	**5**	**4**	**3**	**2**	**1**	$\overline{X}$	**S.D.**	**C.V.**
1. I like being in class.	37.5%	62.5%	-	-	-	4.38	0.49	11.18%
2. I feel happy in class.	37.5%	62.5%	-	-	-	4.38	0.49	11.18%
3. I have fun in class.	32.5%	67.5%	-	-	-	4.33	0.47	10.85%
4. My classroom is a safe and supportive place to be.	32.5%	67.5%	-	-	-	4.33	0.47	10.85%

As displayed in Table 4.8, it was found that 62.5% of the students strongly agreed and 37.5% agreed that they liked being in class and felt happy. Also 67.5% of the students strongly agreed and 32.5% agreed that they had fun in class and their

class was a safe and supportive place to be. Every item shown in this table was rated above 4.30. This signifies that, overall, the participants had positive attitudes toward their class. The coefficient of variations (C.V.) provided more evidence that the majority of subjects performed the student affective engagement concerning the aspect of the WebQuest classroom more or less the same (ranging at about 11%), meaning that the students' responses only slightly varied.

Table 4.9: Students' affective engagement (items 5-8)

Items	**5**	**4**	**3**	**2**	**1**	$\overline{X}$	**S.D.**	**C.V.**
5. My teacher is friendly.	80%	20%	-	-	-	4.35	0.47	10.80%
6. My teacher is supportive and helpful.	60%	40%	-	-	-	4.80	0.41	2.0%
7. My teacher always gives useful advice and feedback.	60%	40%	-	-	-	4.60	0.50	10.86%
8. My teacher knows the subject matter well.	57.5%	42.5%	-	-	-	4.60	0.50	10.86%

Table 4.9 presents the data on student affective engagement in terms of the participants' views toward their teacher. All of the participants showed their agreement in that the teacher was friendly (80% rated strongly agree, 20% rated agree) and knew the subject matter well (57.5% rated strongly agree, 42.5% rated agree). Sixty percent of them strongly agreed that the teacher was supportive and 40% agreed that she always gave useful advice and feedback. Every item shown in this table was rated above 4.30. This signifies that, overall, the participants had positive attitudes toward their teacher. The low percent of CV (CV<11%) for each of the items represented consistency of the students' opinions meaning that the students' responses slightly varied.

Table 4.10: Students' affective engagement (items 9-12)

Items	5	4	3	2	1	$\overline{X}$	S.D.	C.V.
9. My group members are friendly.	92.5%	7.5%	-	-	-	4.58	0.50	10.91%
10. My group members are collaborative.	-	85%	10%	5%	-	4.64	0.40	8.62%
11. My group members are helpful.	10%	82.5%	5%	2.5%	-	4.93	0.27	5.47%
12. I like working with teammates.	7.5%	85%	5%	2.5%	-	3.80	0.51	13.42%

When looking at the students' views toward their team mates in the post-test results, the data from Table 4.11 showed that more than 80% of the participants agreed that their group members were friendly, collaborative, and helpful. The majority of them enjoyed working with classmates (75% strongly agreed and 7.5% agreed). Most of the items shown in this table were rated above 4.00, except the last one ($\overline{X}$ = 3.80). This signifies that, overall, the participants had positive attitudes toward their group members.

These results were supported by the data obtained from the teacher's logs. For example, she noted that

- *"The students looked happy when they were working with their friends in groups." (Student# 1)*
- *"I felt that today every group worked attentively. Most students helped find information and discussed." (Student# 2)*
- *"Many students asked me when they had difficulties in understanding the texts in the first module. Today I saw the team helped explain to each other. Still they needed me to confirm their understanding whether it was correct." (Student# 3)*

However, it can be noticed that negative opinions were also found. There were some students who disagreed that their group members were collaborative and helpful. Similarly, there were some of them who disagreed that they liked working with their classmates.

Based on the data from the teacher's logs, the teacher also noticed that some students showed their unpleasant feelings by complaining that their friends were not responsible for the tasks. Some mentioned clearly that they preferred learning from the teacher. Examples are as follows: *"Anucha told me today he was not happy working in group because he thought his friends always talked and laughed, not seriously working on the task. He felt they were not responsible. He asked me to skip group work and let me do all the teaching*."

Table 4.11: Students' affective engagement (items 13-20)

Items	**5**	**4**	**3**	**2**	**1**	$\overline{X}$	**S.D.**	**C.V.**
13. I feel excited by the task.	-	12.5%	82.5%	5%	-	4.08	.42	10.29%
14. I am interested in the task.	10%	85%	10%	-	-	4.05	.39	9..62%
15. I enjoy participating in group activities in class.	10%	90%	-	-	-	4.10	0.30	7..31%
16.I like gathering information from the Internet to do class activities.	87.5%	12.5%	-	-	-	4..86	.34	6..99%
17. I like class activity that provides rubrics for self evaluation.	5%	80%	12.5%	2.5%	-	3.88	.52	13..40%
18. I want to learn more about the topic.	10%	80%	10%	-	-	4.0	.45	11.25%
19. I enjoy applying what I've learned in class to other real world problems.	10%	90%	-	-	-	4.10	.30	7..31%
20. I find problem-solving tasks helpful.	17.5%	82.5%	-	-	-	4.18	.39	9..33%

When asked how they felt about the class activities, the majority of the students agreed that the task was interesting and they felt excited by the task. All 40 students (100%) either strongly agreed or agreed that they liked gathering information from the Internet, found problem-solving tasks helpful, and enjoyed applying what they had learned to other real world problems. As for the use of

rubrics in WebQuests, most of the students revealed that they liked class activities that provided rubrics for self-evaluation. However, there were 15% of them who showed their disagreement when asked if they liked it.

It can be seen that most of the items shown in this table were rated above 4.0, except the item concerning the use of rubrics ($\overline{X}$ = 3.88). This signifies that, overall, the participants had positive attitudes toward the class activities. However, some disagreement were found in some aspects.

The two sides of the students' views on the use of rubrics in class activities were also reflected during the interview session. Those who perceived the usefulness of rubrics stated, for example, that:

- *"I liked using rubrics because they helped me know what I should do in my writing." (Student# 1)*
- *"The rubrics helped us edit our writing task. I always check for the main idea and supporting details. Then my friends and I checked grammar and spellings." (Student# 2)*
- *"It was difficult at the first time to make use of rubrics. But when we got used to it we found it's very useful. I think I like it." (Student# 3)*
- *"At first, I really had no idea how to use the rubrics. After I practiced using them, I think the rubrics are useful." (Student# 4)*

As for those who felt uncomfortable with the use of rubrics, they expressed their negative comments like

- *"When we self-evaluated our writing work, we were not sure whether we did it correctly or not. I thought I preferred the teacher to give us direct feedback." (Student# 1)*

In conclusion, the findings revealed that the majority of the participants had positive attitudes toward their class, teacher, group members, and class activities. However, some uncomfortable feelings on the use of rubrics were also found as the students preferred the teacher to be the one who gave feedback to them. Overall, based on such findings, it could be concluded that the participants seemed to have positive feelings towards the implementation of the WebQuest modules.

4.5.3 Findings of Students' Cognitive Engagement

The cognitive engagement of the participants was investigated in order to obtain the data on how they were cognitively engaged during the WebQuest instructional processes in three aspects: surface strategies, deep strategies, and self-reliance. The data were obtained through the participants' use of the strategies on memorization (items 1-3), language practice (items 4-5), text comprehension (items 6-8), organizing and summarizing what is learned (items 9-10), connecting new knowledge with past learning (items 11-13), and reliance (items 14-17).

The level of the students' use of these cognitive strategies was rated employing a five-point Likert scale where 5 meant "all of the time," 4 meant "most of the time," 3 meant "some of the time," 2 means "seldom," and 1 meant "never." The analysis of the data was based on these certain ranges of intensity, i.e. 1.00-1.50 for the lowest degree, 1.51-2.50 for a low degree, 2.51-3.50 for a moderate degree, 3.51-4.50 for a high degree, and 4.51-5.00 for the highest degree. Such ranges were used to explain the level of agreement (from the least to the most) with each of the statement regarding cognitive engagement. The followings are the data obtained from the self-rating engagement questionnaire on cognitive engagement using percentage, mean, standard deviations and C.V. (coefficient of variation).

Table 4.12: Students' cognitive engagement in terms of memorization during the implementation of the WebQuest modules analyzed using percentage, mean, standard deviations, and C.V. (coefficient of variation)

Items	5	4	3	2	1	$\bar{x}$	S.D.	C.V.
Memorization 1. I memorized the content of the lesson.	2.5%	85%	12.5%	-	-	3.90	0.38	9.74%
2. I memorized the language focus of the unit.	2.5%	72.5%	25%	-	-	3.78	0.48	12.69%
3. I remembered what I read from the Internet while gathering information.	-	70	30	-	-	3.70	0.46	12.43%

Based on the above table, regarding memorization, the data indicated that most of the students rated themselves as those who used this strategy frequently

in their learning. The low percent of C.V. (C.V. <13%) for each of the items represented consistency of the students' opinions meaning that the students' response only slightly varied.

Table 4.13: Students' cognitive engagement in terms of practicing

Items	5	4	3	2	1	$\overline{x}$	S.D.	C.V.
Practicing 4. I did grammar exercises before class.	-	45%	55%	-	-	3.45%	.50	14.49%
5. I studied at home even when I didn't have a test.	27.5	45	27.5	-	-	4.00	.75	18.75%

As for the language practice (items 4-5), the students rated their learning effort regarding language practice as more frequently than in the pre-test. It can be seen from the data that the participants were also exposed to language practice outside the classrooms. That is, many of them occasionally practiced grammar before class, and there were more than 50% of the students who frequently studied at home even when they did not have a test.

Table 4.14: Students' cognitive engagement in terms of understanding the texts

Items	5	4	3	2	1	$\overline{x}$	S.D.	C.V.
Understanding the texts 6. I underlined major points in the readings.	5%	40%	50%	5%	-	3.45	.68	19.71%
7. I used a dictionary to look up the proper meaning of words.	17.5%	82.5%	-	-	-	4.18	.39	8.12%
8. When I don't know a word, I guess from the context.	17.5%	82.5%	-	-	-	4.18	.39	9.33%

When trying to comprehend the reading texts in the WebQuest lessons (items 6-8), Table 4.13 showed that 17.5% of the students revealed that they guessed the meaning of unknown words from the context all the time, and 82.5% did this "most of the time, meaning that the participants did try this strategy when they encountered

difficult or unknown vocabulary. The data also showed that 100% of the students used the dictionary to look up the proper meaning of words (17.5% rated 'all the time' and 82.5% rated to most of the time'). In terms of underlining major points in the reading, the mean ($\overline{x}$) was 3.45, indicating that the students employed this strategy at a moderate level of frequency.

Table 4.15: Students' cognitive engagement in terms of organizing and summarizing what is learned

Items	5	4	3	2	1	$\overline{x}$	S.D.	C.V.
Organizing and Summarizing what is learned 9. When I read, I asked myself questions to make sure I understood what it is about.	-	-	37.5%	52.5%	10%	2.26	.64	28.31%
10. I summarized major points and information in my readings or notes.	-	-	22.5%	65%	12.5%	2.10	.59	7.89%

In the process of data gathering, the students needed to find relevant information to accomplish the assigned task. Items 9-10 were intended to ask the students to report how they organized and summarized what was learned. The results showed that the means of both the pre-test and post-test were very low (maximum = 2.10). This may be interpreted that these strategies were hardly used by most of the students when dealing with what was read. It was found that there were some students who neither asked questions to make sure they understood the reading, nor summarized major points and information in their readings or notes, but these students constituted the minority in class.

Table 4.16: Students' cognitive engagement in terms of connecting new knowledge with past learning

Items	5	4	3	2	1	$\overline{x}$	S.D.	C.V.
Connecting new knowledge with past learning 11. I always connect what I read with what I've already known.	-	12.5%	87.5%	-	-	3.13	0.34	10.86%
12. I read extra materials to learn more about things that I've learned in class.	-	15%	80%	5%	-	3.10	0.44	14.19%
13. I referred to a book or resource about style of writing, grammar, etc.	55%	40%	5%	-	-	4.50	0.59	13.11%

Based on the constructivist view of learning, students were encouraged to construct their own knowledge by connecting the new information with their prior knowledge, items 11-13 required the participants to reveal whether they were cognitively engaged in the learning process in this way. The results indicated that the highest mean (X = 4.10) was found in item 13 ("I referred to the book and resources about style of writing or grammar," etc.) meaning that they tried to relate what they had already learned with what they wanted to understand or express in their writing. It was found that 100% of the participants did additional reading on the topics that were introduced and discussed in class (12.5% rated 'most of the time' and 87.5% rated 'some of the time'), whereas the data from the pre-test showed that 32.5% of them rated that they never connect what they read with what they had already known. . Also, almost all of them (95%) read extra materials from what they had learned (15% rated 'most of the time' and 80% rated 'some of the time') whereas the data from the pre-test showed that only 32.5% of them rated that they never read extra materials to learn more about things that they had learned in class.

Table 4.17: Students' cognitive engagement in terms of relying on classmates and relying on teacher

Items	5	4	3	2	1	$\overline{x}$	S.D.	C.V.
Relying on classmates 14. I asked my friends what I what I wanted to learn/know more.	2.5%	72.5%	25%	-	-	3.78	0.48	12.69%
15. I asked my friends the things I didn't understand.	2.5%	72.5%	25%	-	-	3.78	0.48	10.58%
Relying on teacher 16. I asked the teacher what I wanted to learn more.	-	10%	47.5%	32.5%	10%	2.58	0.81	31.39%
17. I asked the teacher the things I didn't understand.	10%	87.5%	-	-	2.5%	4.03	0.58	14.39%

Items 14-17 were used to identify the students' cognitive engagement regarding independent learning by means of rating the level of their reliance on their teacher and peers during the instructional process. The findings from the pretest and posttest revealed that the overall students relied on their teacher more than their peers. The data from the logs also found that when students encountered any difficulties or problems, they always raised their hands and asked for help from the teacher.

Apart from the self-rating questionnaire, the qualitative data concerning student cognitive engagement were also obtained from a semi-structured interview. The students' responses revealed some factors that increased the level of students' engagement in the learning process.

The first factor dealt with the use of computer technology. Most of the students felt that studying with the Internet-based lessons was more interesting than the traditional classroom. For example, the students said that

- *"Reading from the Internet is interesting. Studying from the textbook is Boring." (Student# 1)*
- *"At present, we should use computers in classrooms in every subject. (Student# 2)*
- *"It's necessary for us to use the Internet to support our study in all aspects." (Student# 3)*
- *"I enjoy searching for information on the Internet." (Student# 4)*

Second, students stated that they actively participated in class activities due to the teacher's supportive role. Most of the students said that the teacher was friendly and supportive. When they encountered difficulties or problems, they could immediately ask for assistance from the teacher. It was obviously seen from what the students commented:

- *"The teacher taught us with patience and encouraged us to learn step by step". (Student# 1)*
- *"The teacher never scolded at students when we couldn't answer her questions." (Student# 2)*
- *"Normally, I was very quiet in class. Now I asked more questions about what I didn't understand because the teacher was very kind." (Student# 3)*
- *"When I couldn't do the task, the teacher taught me how to find relevant information and how to connect my ideas with those supporting data." The teacher was always supportive. (Student# 4)*

Third, students stated that the increase in their confidence affected their increased engagement. For example they said that

- *"The WebQuest activities helped me gained more confidence in reading English texts from the Internet. I felt more confident to read for gathering more information," (Student# 1)*
- *"In the second task, I could write a paragraph in English. It made me feel confident I could improve my English. When I got home, I*

practiced more grammar exercises. I want to improve my English writing ability." (Student# 2)

In addition, students agreed that they engaged more when they worked in groups. They also agreed that they made contribution for the task accomplishment because they had good relationship among group members and liked working in groups. For example, they stated that

- "*In most classes, the teachers give lecture and I just listen to what they teach and seldom ask questions. When I do WebQuest task in groups, I ask the teacher questions more often and I have to discuss and share ideas. Sometimes I teach my friend how to find the information," (Student# 1)*
- *"I felt good that my friend accepted my ideas. I often prepared information before class so that I would come up with useful ideas for our group, (Student# 2)*
- *"My teammates were very helpful. They helped explain what I didn't understand," (Student# 3)*
- *"For me, it's difficult to write in English individually. In groups, we can help each other find the right words, forming sentences and paragraphs." (Student# 4)*

In addition to the positive opinions on cooperative learning, students commented that the WebQuest tasks were interesting and related to real world tasks . Some students expressed their views on the tasks as follows:

- *"To me, the task was relevant and interesting. If the class was boring, I wouldn't attend the class," (Student# 1)*
- "*I thought that the tasks that required gathering information on the Internet were like real world tasks. I preferred this type of task, (Student# 2)*
- *"The task made me feel like solving a real problem for real situation. I enjoy sharing my ideas." (Student# 3)*

In conclusion, from the data analysis already mentioned, it was evident that the students were highly engaged in all aspects of the engagement during the WebQuest instructional process. Therefore, the hypothesis was accepted as the implementation of the WebQuest modules had a positive effect on all three aspects of student learning engagement: behavioral, affective, and cognitive engagement.

Research question 5: What are the students' perceptions of the implementation of the WebQuest modules?

4.6 Findings of students' perceptions of the implementation of the WebQuest modules

Students' perceptions of the implementation of WebQuest modules were determined by the qualitative data obtained from the students' learning logs. The students were asked to keep their logs after studying with each WebQuest module. They gave their comments on the usefulness, the problems or difficulties and their preferences of the instructional modules. In their logs, they were asked to record their opinions on three main aspects: the usefulness of the WebQuest activities, the level of difficulty of the tasks, and their preference in studying with these WebQuests. The guided questions were provided for the students so that the required data for the study would be obtained. Therefore, the information from the students' learning logs was presented in three main categories accordingly. They are as follows:

4.6.1 Findings concerning students' perceptions of the usefulness of the WebQuest modules

The data on students' perceptions of the WebQuest modules were collected in their logs written after finishing each WebQuest lesson. The participants perceived WebQuests as useful lessons for a number of respects. They reported the usefulness of the WebQuests as follows:

1. Providing students with opportunity to learn more vocabulary and gain more content knowledge

Most of the students' first concern is that they had learned a lot new vocabulary from the lessons and they found it useful in learning English and WebQuest modules provided them this opportunity. For example,

- *"One student stated that "WebQuests have interesting reading activities. [They] are useful because I learned a lot of new vocabulary from what I've read." (Student # 1)*
- *"Another supported that "In studying with WebQuest, I gained more knowledge." (Student # 2)*
- *"Another student supported her claim that "I learned more vocabulary." (Student # 3)*
- *"The forth student said that "I gained more knowledge on global warming. All of us should know about this serious problem." (Student # 4)*
- *" The other said, "I gained new knowledge from reading. And I read more at home to find more information." (Student # 5)*

2. Providing students with opportunity to practice reading and writing

In terms of reading, many students' opinions revealed the usefulness of WebQuests was to provide them opportunity to practice a lot of reading through the information gathering process. Most students stated that they were never exposed to as many authentic texts as in the WebQuests.

- *"WebQuest lessons make me read a lot. It's useful for me to practice more reading." (Student # 1)*
- *"I had a chance to practice reading English texts from the Internet. It's a useful lesson." (Student # 2)*
- *"There are a variety of reading resource links for us to practice reading." (Student # 3)*

Concerning practice in writing, many students revealed the WebQuest modules were useful in providing them opportunity to practice writing skill through the writing task process.

- *"My teacher usually gave us writing assignment as homework. We didn't have chance to practice writing in class. In Webquest lessons, we have chance to practice writing, revising the first draft and practice editing our work." (Student # 1)*
- *"We focus on the content when we write the first draft, so our grammar is awful. Then we practice revising our work." (Student # 2)*
- *"I can practice planning my writing, drafting and revising my written work in class." (student # 3)*

3. Assisting students to learn how to work in groups

According to many students' opinions, the WebQuest modules were useful because they helped provide opportunity for students to work in groups. They revealed that they felt more comfortable when working in groups and they could also help each other learn the lessons and overcome difficulties in learning. For example, they stated that

- *"WebQuests let us to help each other in group work, we feel relaxed when we worked with friends." (Student # 1)*
- *"When we have problems, our group help find solutions"*
- *"I'm happy to work with my friends" (Student # 2)*
- *"I like group work. It makes me feel safe." (Student # 3)*
- *"I feel more comfortable when working with my friends as a group." (Student # 4)*
- *"We help each other get the information, brainstorm for the ideas to get the writing task done. We learn from each other." (Student # 5)*

Besides, students pointed out that WebQuests also assisted them to learn how to work in groups. They realized that this skill may be useful for their future career.

- "*I found that WebQuest helps me learn how to divide responsibility to each member, accept others' opinions, and give reasons for accepting or rejecting people's opinions." (Student # 1)*
- *"I learned to listen to others' opinions and accepted with reasons." (Student # 2)*
- *"It's not easy to deal with the situations when a lot of different ideas pooled out in the group. We learn little by little because we know that we may have to work cooperatively in our future career." (Student # 3)*

4. Improving the students' reading and writing abilities

The students express their views on the usefulness of the WebQuest modules in that the lessons helped improve their reading and writing. The students thought that their reading improved after they had a chance to practice through the WebQuest lessons. Some stated that they could understand the reading texts more than they could before. Others said they could guess the meaning of the unknown words from the context as well as finding the main idea of the paragraph. They said, for example, that

- *"Reading English texts from the Internet increase my vocabulary and content knowledge." (Student # 1)*
- *"Believe it or not I can remember a lot of vocabulary on global warming." WebQuest lessons are useful." (Student # 2)*
- *"I learn how to read for relevant information; it's no need to read every single word in order to get the gist." (Student # 3)*

Concerning writing improvement, many students felt proud of themselves that they could write in paragraphs after studying with WebQuests. They thought they could do the writing exam with more confidence. They said, for example, that

- *"I learned how to find relevant information and how to connect my ideas with those supporting data. I think my writing improved." (Student # 1)*
- *"I know how to start the paragraph with the main idea and followed by supporting details." (Student # 2)*
- *"My writing performance is better than at the beginning of the course." (Student # 3)*

5. Assisting students to gain more self confidence

The students also expressed their views that WebQuest was useful in assisting them to gain more confidence to read and write in English. They felt that the learning process they were engaged in taught them to know how to learn: how to read to gather relevant information, as well as how to analyze the information and plan for the writing task.

- *"The teacher taught us by modeling the writing process, I could follow these steps when I performed my task." (Student # 1)*
- *"The WebQuest activities help me gained more confidence in reading English texts from the Internet. I felt more confident to read for gathering more information." (Student # 2)*
- *"I felt more confidence to read English texts." (Student # 3)*

However, there were some students who were not familiar with the new teaching style and showed less satisfaction of this kind of activity. For those who found that WebQuests were less useful, they generally emphasized their worry about not having enough knowledge and practice to prepare themselves for the final exam. One student mentioned about the unfamiliarity of the WebQuest lessons since he got used to the traditional learning environment where the lectures was common. He said, "*It's a little bit difficult for me to adjust to the new teaching style and learning process. I'm not used to reading the text on my own. The teacher always helps translate the text for me,"* The support could be found in another student's explanation that, *"I still had a hard time understanding the reading texts.*

They are too difficult for me. Normally, the teacher helps translate the reading for us."

6. Creating good classroom atmosphere

The students also mentioned the learning atmosphere in their classroom that the WebQuest lessons could create. Most students wanted to attend the class where they had fun in a relaxing and enjoyable learning atmosphere. They stated that they learned better in this kind of learning environment. They noted that

- *"WebQuest helps make our class more enjoyable." (Student # 1)*
- *"I felt happy when learning with WebQuests. The class was relaxing." (Student # 2)*
- *"I have fun working with my friends in class". (Student #3)*

7. Gaining problem-solving skills

The students noted that the WebQuest activities helped them gain problem-solving skills. For example, one of them said, *"Solving problem in WebQuest was like solving problems in real life. I learned how to gather relevant information, analyze it for my final solution." Another student supported that "I learn to solve problems in the task step by step. It's very useful", and the other said "I think I learned problem-solving skills when we help each other to do the task."*

However, there were some students who were not familiar with the new teaching style and showed less satisfaction with this kind of activity. For those who found that WebQuests were less useful, they generally emphasized their worry about not having enough knowledge and practice to prepare themselves for the final exam. One student mentioned about the unfamiliarity of the WebQuest lessons since he got used to the traditional learning environment where lecture was the main method of teaching as could be seen in the following sentences:

- *"It's a little bit difficult for me to adjust to the new teaching style and learning process. I'm not used to reading the text on my own. The teacher always helps translate the text for me." (Student # 1)*
- *"I still had a hard time understanding the reading texts. They are too difficult for me. Normally, the teacher helps translate the reading for us." (Student # 2)*
- *"The class was fun but I worried about the faculty final exam. If too many activities, there will be not enough practicing on necessary grammar points." (Student # 3)*
- *"I want the teacher explain the lesson. This will be more useful." (Student # 4)*

In conclusion, based on the data obtained from the students' logs, the participants had positive perceptions of the implementation of the WebQuest modules. They perceived the WebQuest modules as useful lessons for them in terms of building up their vocabulary, helping them gain more knowledge, providing them opportunities to practice reading and writing, assisting them to improve their reading and writing abilities, helping them to gain more self-confidence, creating a good learning atmosphere, and providing opportunities for developing problem-solving skills. However, some students found WebQuests less useful because of their reliance on the teacher and their unfamiliarity of the new style of teaching and learning.

4.6.2 Findings concerning students' perceptions of the level of difficulty the WebQuest modules

The students were asked to specify the difficulties and problems they encountered during studying with the WebQuest modules and how they overcame them. The main problems noted by most of the students included the time constraints, overwhelming information, and overwhelming new vocabulary. Only a few stated that they had problems concerning difficult writing tasks, dislike of group work, and technical problems.

1. The time constraints

This problem was noted by most of the students, especially after studying the first WebQuest modules. For example, they wrote

- *"Not enough time for me to finish all the reading." (Student # 1)*
- *"Not enough time for my group to find the answers from the reading texts." (Student # 2)*
- *"I want more time." (Student # 3)*
- *"I can't finish writing within the class time." (Student # 4)*
- *"If I had more time, I would be able to find all the answers." (Student # 5)*

Most of the students overcame this problem by talking to the teacher to ask for the reduction of the reading texts so that they would have more time to find all the information needed and do all the tasks.

2. Overwheming new vocabulary

The students revealed that they encountered the problems of too many new vocabulary words in the reading texts. Some students solved this problem by using a dictionary. Others decided to ask their teacher to give the meaning of the word. The students wrote, for example,

- *"I couldn't understand the reading because I found too many new vocabulary words." (Student # 1)*
- *"Too many difficult words for me. I was tired of opening the dictionary." (Student # 2)*
- *"I found a lot of unknown words. I use the online dictionary to help me." (Student # 3)*
- *"I asked the teacher the meaning of unknown words." (Student # 4)*

3. Technical problems

Another major problem mentioned by most of the students concerned technical problems such as slow connection to the websites and the expired links. The students stated their problems as follows:

- *"The university Internet had a slow speed. Often, we had to wait for a long time." (Student # 1)*
- *"I could not find the links. So I search "Google" for information of the same topic but it took time." (Student # 2)*
- *"Can the teacher let us search for the resource links before class?" (Student # 3)*

4.6.3 Findings concerning students' preference of the WebQuest modules

Based on the data from the students' logs, when asked about their preferences of the WebQuest module, the majority of the participants indicated that they enjoyed studying with WebQuests in the following aspects: using the Internet, searching information from online resources, doing group work activities, and doing real life tasks. For example, the students stated that

- *"I like group work. It makes me feel safe." (Student # 1)*
- *"I prefer this type of activity than studying from the textbooks page by page." (Student # 2)*
- *"I like reading from the Internet. Textbooks are boring." (Student # 3)*
- *"I like WebQuest activities because they help me improve my English reading. "I like WebQuest activities because they help me improve my English writing." (Student # 4)*
- *"I enjoy gathering information from the Internet. It's realistic." (Student # 5)*
- *"I enjoy WebQuests and I feel more confidence when reading and writing in English." (Student # 6)*

- *"I like learning with WebQuests because they helped create challenging and interesting classroom atmosphere."(Student # 7)*

However, negative feedback was also found from the logs. It is found that some students may have negative attitudes toward group work activities. Two students stated that they did not like working in groups.

One of them mentioned that *"I did not like working in groups because my teammates did not pay attention to the assigned work.*" In addition, another two students (5%) wrote that *"I preferred learning from the teacher."*

Overall, the majority of the students showed positive perceptions of the WebQuest lessons. The aspects of WebQuests that the students liked included interesting and meaningful tasks, group activities, reading from the Internet, and challenging classroom atmosphere. However, some negative feedback was also found regarding their dissatisfaction of group work participation and their preference on learning with the teacher only.

4.6.4 Findings concerning students' perceptions of the WebQuest modules

In the interview, students were asked to answer questions concerning their perceptions of the teaching modules in two aspects: what they liked and disliked most about the WebQuests. The answers were similar to what they wrote in their logs. Most of them liked studying with WebQuests because they liked the use of the Internet, group activities, meaningful tasks, a relaxing learning atmosphere, and supportive teaching.

Regarding what they disliked about the WebQuests, only a few students mentioned about their preference of the traditional style of teaching and learning where the teacher is the one who transmit the knowledge to students. One student said that *"I dislike reading parts. I could not understand the texts from the Internet because most of them were too difficult."*

However, many students found that difficult tasks are challenging and they were willing to help each other to accomplish the task. They felt a sense of success. One of them explained that:

"When I first look at the task, I felt that it's too difficult. But when I follow the steps of the teacher, the first checklists gave me ideas what it is all about we are going to study. The sub-task is step-by-step lead us to the assigned final task. It's amazing that when it comes to the writing task, we have enough information, we could think of how to present our new idea, we know how to organize our idea into a well-presented paragraph. From piece by piece, we produce something amazing. I like it." (Student # 1)

In conclusion, the data obtained from the students' learning logs regarding the usefulness of the lessons can be classified into three major aspects. As for cognitive aspect of instruction, they perceived the WebQuest implementation as useful in enhancing their reading skill. Also, the participants thought that the intervention could help improve their writing performance. With regard to the affective domain, the students perceived the new learning environment with WebQuest activities could motivate them to learn and engage more in the learning process. Finally, they revealed that they preferred this kind of activities when they had chances to be exposed to the Internet resources and the tasks are interesting and purposeful.

It is found that these findings support the hypothesis that the students had favorable perceptions of the instructional modules with regard to the usefulness, level of difficulty, and their preference for WebQuest.

Summary

This chapter presents the findings according to five research questions: (1) How can WebQuest modules be developed?, (2) What is the effect of the implementation of WebQuest modules on the students' reading ability?, (3) What is the effect of the implementation of WebQuest modules on the students' writing ability?, (4) What is the effect of the implementation of WebQuest modules on the students' learning engagement?, and (5) What are the students' perceptions of the implementation of WebQuest modules?

The development of the WebQuest modules was carried out by following the WebQuest framework whose main principles are based on the constructivism theory

of learning. The approaches in reading and writing instruction was molded into the critical elements of the WebQuest modules specifically designed for teaching in an EFL classroom to meet the objectives of the English course. The teaching steps were adapted from the instructional plan proposed by Stoller (2002).

With regard to the examination of reading and writing test results, it was found that the implementation of WebQuest modules was effective to enhance the students' reading and writing abilities.

The findings from the investigation of student engagement indicated that the WebQuest modules could promote student engagement in all three aspects: behavioral, affective, and cognitive engagement.

The results concerning the students' perceptions of the WebQuest modules revealed that the majority of the students perceived the usefulness of the WebQuest lessons and they had positive attitudes towards the WebQuests implementation.

CHAPTER V
SUMMARY, DISCUSSION, IMPLICATIONS AND RECOMMAENDATIONS

5.1 Introduction

This chapter begins with a summary of the present study followed by the discussions of the research findings. Next, some implications are suggested, and the limitations of the study are stated. Finally, some recommendations for further study are proposed.

5.2 Summary of the study

The purpose of this study is to develop the WebQuest Modules to promote students' English reading and writing abilities of engineering students taking a Technical English course in an attempt to integrate technology into EFL instruction to improve language learning as well as to transform traditional teacher-centered classroom practice into cooperative learner-centered environment.

The WebQuest modules were developed based on the predetermined objectives of the Technical English course with a focus on essential academic reading and writing skills. Three experts were invited to validate and evaluate the modules and lesson plans, as well as the reading and writing test. After that, the WebQuest modules, lesson plans, and the reading and writing test were revised and improved according to the experts' comments and suggestions. Later on, two WebQuest modules were piloted with a class of 28 engineering students during a summer session. These students were similar to the participants in the main study in their characteristics. During a six-week pilot study, the students were introduced to the WebQuest activities and two selected WebQuest modules were implemented. The students were asked to write learning logs to give feedback on how they perceived the usefulness, difficulties as well as their preferences of WebQuest lessons. The student engagement questionnaire was administered after the WebQuest implementation. Finally, some of the participants were randomly selected for a semi-structured interview to gather more in-depth qualitative data. The information gained from the pilot study was used to adjust the lessons and research instruments as appropriate.

After the pilot study, the experiment for the main study was conducted with an intact class of 40 Engineering students enrolled in an EFL reading and writing course at Rajamangala University of Technology Pra Nakhon (RMUTP). The effectiveness of the WebQuest modules in enhancing English reading and writing achievement, students' learning engagement, and their perceptions of these modules were investigated both quantitatively and qualitatively. The investigation process and the instruments used were summarized in Table 5.1 below:

Table 5.1: The summary of the investigation process and the instruments used

The investigation process	The instruments used	Types of the gathered data
Before the WebQuest implementation	1. The reading and writing test (pretest)	Quantitative data
During the WebQuest implementation	2. Students' logs	Qualitative data
	3. Teacher's diary	Qualitative data
After the WebQuest implementation	4. The reading and writing test (posttest)	Quantitative data
	5. The student engagement questionnaire	Quantitative and qualitative data
	6. Semi-structured interview with the participants	Qualitative data

5.3 Summary of Research Findings

The research was conducted to investigate the effectiveness of the WebQuest modules to enhance the students' reading and writing abilities. The effect of the WebQuest modules on student engagement during the instructional process was also explored. In addition, the students' perceptions of the implementation of the WebQuest modules were examined. The summary of findings is presented according to the above mentioned investigation.

5.3.1 The effect of the WebQuest modules in enhancing reading and writing abilities

To determine the effectiveness of the WebQuest modules in enhancing reading ability, the mean scores of the reading pretest and posttest were compared. The findings showed that there was statistically significant difference between the reading pretest and posttest mean scores at the level of .05. As for the enhancement of writing ability, it was found that there was a positive effect of WebQuest on students' writing performance as the participants improved their writing performance significantly after the implementation of WebQuest modules. The results of the study indicated that the implementation of WebQuest modules is significantly effective in enhancing the students' reading and writing abilities.

5.3.2 The effect of the WebQuest modules in enhancing student engagement

The research findings also indicated that Web-based learning activities could make students more engaged in the learning process. The effort to create changes in terms of student active participation was successful when students became more behaviorally, affectively, and cognitively engaged during the instructional process. Overall, it was found that the implementation of WebQuest modules had a positive effect on student learning engagement in all three aspects: behavioral, affective, and cognitive engagement.

5.3.3 Students' perceptions of the implementation of the WebQuest modules

With regard to the investigation on the students' perceptions of the WebQuest activities, the findings from the students' logs and interviews showed that most of the students had positive perceptions and attitudes towards the implementation of the WebQuest modules. Students' feedback found in the students' logs was generally very positive with a majority of the participants believing that WebQuest activities were a useful resource for exposing to real reading experience and the purposeful writing tasks. The participants revealed that the use of WebQuest modules could bring about the improvement of their own reading and writing abilities and the increase in student engagement in the learning

process. There was also a strong evidence showing that the students preferred studying with this Web-based instructional modules.

5.4 Discussion of Research Findings

This part discusses some distinguishing features based on the findings of the study in the previous chapter. The discussion can be divided into four major aspects: the effectiveness of the WebQuest modules in enhancing students' reading ability, the effectiveness of the WebQuest modules in enhancing students' writing ability, the effectiveness of the WebQuest modules in enhancing student engagement, and students' perceptions of the implementation of the WebQuest modules.

5.4.1 The effect of the WebQuest implementation in enhancing students' reading ability

It could be claimed from the findings that the use of the WebQuest modules effectively enhances students' reading ability as the participants increased their reading performance significantly after the exposure to the treatment. The enhancement of students' reading ability could be due the following factors.

First, the knowledge of vocabulary and content that the students gained from the WebQuest lessons may have affected the improvement of students' reading comprehension ability. Based on the findings, the students mentioned clearly in their logs about the usefulness of the WebQuest modules in providing them opportunities to learn new vocabulary and content knowledge when they were exposed to a lot of reading materials. This is supported by the view of Nation (2002: 267) in that "reading has long been seen as a major source of vocabulary growth." Moreover, both L1 and ESL/EFL research studies have provided evidence showing the possibility of incidental vocabulary learning through repeated exposure (Pigada & Schmitt, 2006).

In order for L2 learners to read well, they must have an adequately sized vocabulary and must be able to recognize the words in that vocabulary quickly and accurately. When working the WebQuests, the students had opportunity to explore many of the reading texts of the same topics from the Internet. They were exposed to content vocabulary several times and they learned them and also used them in their

writing tasks. Thus, from the students' perspectives, teaching English reading through WebQuests can help students learn more vocabulary, and this might also affect their reading comprehension ability to a certain extent.

Apart from the vocabulary knowledge gain, the students noted that they also learned more content knowledge which could assist their reading comprehension. Many researchers agree that background knowledge plays an important role in reading comprehension (Grabe & Stoller, 2002). Difficulties in reading may arise when readers do not have adequate background knowledge information. The participants found that being exposed to a lot of reading materials from the Internet was a good opportunity for them to gain more content knowledge. They said that it was more difficult at the beginning but when they had more background knowledge, reading comprehension seemed to be easier for them.

According to Carrell & Grabe (2002: 245), "appropriate background knowledge about the topic being read helps learners understand the reading better. It is an important element in reading comprehension, but only one of many." Therefore, one of many possible factors that contribute to the improvement in students' reading comprehension ability in this study may have been due to the increase in their vocabulary and background knowledge.

Second, as reflected through the students' logs, the WebQuest lessons provided them with opportunities to practice a lot of reading while they were gathering information needed to complete the tasks. It cannot be denied that practice is necessary for improvement in any learning, not excluding reading. According to Eskey (1986: 21, cited in Ranandya & Jacobs, 2002: 300), "people learn to read, and to read better, by reading." The more chance of reading practice the students have, the more chance of reading improvement they are likely to get.

When performing a WebQuest task, the students needed to read several texts aiming at gather a lot of information. They were required to read as they needed information for writing. Some students did not realize, from the beginning of the course, that they were practicing English reading. Not until after studying the third WebQuest module, they did reveal that they thought WebQuest was useful as it provided them opportunities to practice a lot of reading. For this reason, this factor might have possibly contributed to the students' reading improvement.

Third, sufficient scaffolding has been provided for the students. Scaffolding is an important element of WebQuest strategy. As such, sufficient support provided can be an important issue for explaining the significant results of reading ability improvement. Theoretically**,** the design of scaffolding is at the heart of the WebQuest model (March, 2004). It can be noted that when reading the authentic texts from the Internet, students always found it very difficult to cope with. Although the World Wide Web provides the opportunity for language learners to access authentic materials in the target language, this very authenticity can be problematic due to the level of the language they encounter or the genre with which they are unfamiliar (Murray, 2005). Unlike textbook materials, authentic texts that students read from the Internet cannot be simplified to suit the students' proficiency level. In doing WebQuest, the students have to deal with a lot of authentic materials that can be overwhelming and discouraging for them. Therefore, scaffolding is needed to help students overcome such difficulties.

The significant role of scaffolding in enhancing reading was supported by the research findings of Tsai (2006)**.** Most of the students were able to comprehend the authentic texts due to the inclusion of abundant and firm scaffoldings which were provided to support them in the implementation of the task. The students also found that the prepared scaffoldings were very useful and could help them improve their reading and writing performance. Without such guidance, they might have been discouraged when they had encountered difficult texts.

It can be seen that different students needed different levels of support during the learning process. Some needed the teacher to help them find the meaning of difficult words; others wanted the teacher to explain to them how to link two ideas together. Some of them needed help in the process of editing the group tasks. The concept of scaffolding in WebQuest offers opportunities to the teacher to provide assistance based on the students' immediate needs or at the time they were confronting the difficulties. As soon as they could solve the problems, they were likely to move on to another step of learning. It is interesting to note that WebQuest activities might be suitable for teaching mixed-ability classes. With the teacher's scaffolding through the role of a facilitator, students could make progress in their learning to their appropriate level.

5.4.2 The effect of the WebQuest implementation in enhancing students' writing ability

As for the enhancement of writing ability, it was found that there was a positive effect on students' writing performance as the participants improved their writing performance significantly after the implementation of WebQuest modules. The following discussion concerns with what might contribute to this finding.

In this study, the instruction based on the integration of the WebQuest strategy emphasized the process of writing. Every single step in the WebQuest lessons lead the students to the whole writing process: planning (gathering and analyzing information), drafting, revising, and editing. The writing task was aimed at setting the goal of the lesson. To complete the task, the first step was to read to gather relevant data. The students got the needed information as well as a set of content vocabulary. Vocabulary knowledge plays an important role not only in reading, but in writing as well. Leeds (2003) states that lack of vocabulary can be the main cause of the interruption of the writing process. This stage of instruction, therefore, helped prepare students with both vocabulary and necessary information for writing.

After gathering information from the Internet, with the meaningful purpose in mind, the students moved on to the next step of analyzing the data they gathered and putting together their ideas to form the first draft of the writing product. Then they learned how to revise and edit their work. Through these steps of teaching and learning the writing process, students learned how to write a well-organized paragraph with fewer grammatical errors.

During the process of writing, self-editing was one factor that assisted students to write better. This is because many participants stated in their logs that the self-editing stage was very useful in terms of paragraph organization, use of vocabulary, sentence structures and grammatical correctness. In this rewrite process, students would see their strengths and weaknesses of their writing as well as would make themselves aware of the elements that constitute a good essay (Leeds, 2002).

It can be seen that studying with WebQuest lessons assisted students to experience the whole process of writing and at the end of the course they felt that

their writing performance improved. Evidently, many students revealed in their logs that WebQuest helped them improve their writing. Now they know how to plan for the writing, make an outline, write a first draft, and revise and edit their work.

Writing skill is not easy to master. Normally, students found that EFL writing was the most difficult and having to take the writing exam was very scary. Some may even not be able to produce a single correct sentence in their exam paper. The students often said that they actually had some idea to write but the problem was that they lacked vocabulary knowledge and they did not know how to express it correctly and appropriate in English.

Within the short period of time during the experiment, it was rewarding when seeing the students put their effort in their writing task, or when hearing that they were proud that they could write a paragraph as they thought they never could be able to. Moreover, they felt more confident when taking a writing exam, as they reflected their views in their logs that they did not have to hand in a blank paper any more, but they could write in English now. In addition, based on the data obtained from the teacher's diary, a lot of "cut and paste" was found in their work in the first lesson. The teacher paid more attention to this issue by providing more practice on paraphrasing what the students had got from the information gathering stage. This is to train them on how to make references and do citations.

To conclude, it seems that WebQuest lessons can be one effective way to help students improve their writing ability. The students revealed in their logs that the WebQuest modules were useful and they helped them improve their reading and writing abilities. The findings could be due to the fact that the WebQuest tasks could be designed to integrate writing with reading. To complete the task, the students had to gather the needed information from the Internet. They had a chance to practice reading by being exposed to a lot of reading texts and they also gained content vocabulary ready for the writing tasks. With the teacher' assistance, this process of learning could effectively enlarge the amount of vocabulary in the process of reading and provide ideas and background knowledge for writing. After the students had sufficient information, they learned how to plan their writing, how to use the gathered information to support their ideas, how to write the first draft, and how to come up with the revised and edited version with appropriate coherence in their writing.

Throughout the whole teaching and learning procedures repeated every module lesson, the participants in this study gradually felt more confidence in reading and writing in English and shared similar perceptions of the reading and writing improvement.

5.4.3 The promotion of student engagement

Based on the research findings, it is evident that Web-based learning activities in the present study could make students more engaged in the learning process. It illustrates that the implementation of the WebQuest modules is effective in enhancing student engagement behaviorally, affectively, and cognitively. The students were highly engaged in the process of learning may be due to several factors.

First, the use of computer technology evidently increased the students' engagement. Most of the students felt that studying with the Internet-based lessons was more interesting than studying from the textbooks page by page. Kearsley & Shneiderman (1999) state that technology can provide learning environment that enhances engagement. This view is supported by a study of Farmer-Dougan & McKinney (2001) revealing that the use of computer impacts student engagement. Evidently, students who are reported as having high engagement are more likely to enroll in courses that require the use of computers either in or out of class.

Second, cooperative learning activities could affect students' active participation in the learning process. When working with friends in groups, the participants revealed that they felt more confident in answering the teacher's questions. Their teammates who were more able could support them and they would not have to deal with the embarrassment or the feeling of loosing face when they answered the questions incorrectly. According to Jacobs & Hall (2002: 53), when students work in a mixed-ability group, the advantages are "to promote peer tutoring, help to break down barriers among different types of students, and encourage on-task behavior."

Third, peer relationship is an important factor for student engagement. Based on the data obtained from the questionnaire, the participants had positive attitudes toward their peers. Evidently, most of the students enjoyed working with their group members. They perceived their friends as cooperative, friendly, and supportive.

They also felt comfortable in groups, they had good relationship with friends, and they helped each other do the tasks. This finding is supported by Farmer-Dougan & McKinney (2001) who found that there was a strong relationship between student engagement and the ability to deal with other students; students who reported a higher ability to deal with peers tended to be highly engaged.

Fourth, the students' positive view of their teacher might be one supporting factor for the students' active involvement in the learning process. Findings from the questionnaires indicated that the participants had positive attitudes towards their teacher. They rated strongly agreed or agreed that their teacher was friendly and supportive. The data from students' logs also provided similar feedback as they said, for example,

- *"The teacher always helps us when we had problems." (Student #1)*
- *"I think the teacher is very kind; she never called me "stupid" when I answered the questions incorrectly." (Student # 2)*
- *"I liked when the teacher joined our group as if she is one of our member." (Student # 3)*

5.4.4 Difficulties of the use of WebQuest activities

Although in general the students had revealed positive perceptions of the implemented WebQuest lessons, some aspects of the teaching procedures towards which they expressed complaints could not be ignored. Most negative responses were concerning the time constraints. The students remarked that the time provided for them to complete the reading and writing tasks was insufficient. Some of the students felt discouraged when they encountered this situation. To maximize the benefits of the implementation of WebQuest, the teaching procedures should be carefully planned, and the workload of class activities should be made appropriate within the designated class time.

Students' negative attitudes towards cooperative learning are another major concern. There were some students who expressed their negative feelings while performing group tasks. Such negative perceptions might prevent them from learning. Since WebQuest activities are cooperative in nature (March, 2002), and require students to work cooperatively in groups, teachers who desire to employ

WebQuests in their classrooms should find ways to help these students feel more comfortable when working with their peers.

5.4.5 Conclusion

To conclude, the effectiveness of the WebQuest modules was reflected by the findings from students' reading and writing improvement, results from the investigation of student engagement, and findings from students' perceptions of the WebQuest lessons. The justification for the effectiveness of the WebQuests ranged from the arrangement of teaching procedures, activities for learning support, the relationship between students and the teacher, and the relationship among peers.

5.5 Implications

Based on the findings of the study, it can be concluded that the implementation of the WebQuest modules was effective in enhancing the students' English reading and writing abilities as well as promoting students' learning engagement and positive perceptions of the WebQuest instruction. The followings are the implications of the study mainly obtained from research findings, students' reflection, and classroom observation. Some suggestions are also made for those who would like to employ WebQuest in English reading and writing instruction.

The implications of this study point to the importance of the use of computer and technology in education including in language learning. There is no chance that technology will stop their roles in all aspects of our life. For this reason, the educational plan may not be able to ignore the computer use. According to the present study, WebQuests can be one promising alternative for EFL teachers because it has been proved that they can be used successfully in one EFL context.

Despite the growing trend of Web-based instruction, the integration of technology in EFL classrooms is still a new phenomenon in many educational contexts. It is hoped that the research findings may encourage EFL instructors to adopt positive features of Web-based learning into their current educational practices and be able to come up with the sound pedagogy in order to aid their students' learning in the rapidly changing world.

5.5.1 Time given for the activity is critical.

The issue of time is found critical when implementing WebQuest lessons. Based on the findings of the study, the benefits of the instructional modules regarding the enhancement of students' reading improvement came from the exposure to the reading practice. In a WebQuest class, teaching students to read authentic materials and to write is time consuming. A number of research studies on WebQuests are also concerned with the issue of insufficient time for doing class activities For example, a study of Davis (2003) has revealed that the participants of the study felt overwhelmed with the reading texts and they could not finish the task within the time given and this could lead to a lot of frustration. He suggests that the teacher might consider reduce the number of web resources; or let the students print out the reading materials and spend some time reading them before coming to class.

From this study, it was fortunate that many students willingly spent a lot of time outside class to prepare their reading, but this might not often occurred in a class with low motivated learners. Therefore, teachers who use WebQuest lessons should be well-prepared to balance the time available and the design activities. Teachers need to be sensitive to their students' feelings. If they are motivated to learn, teachers can prepare something for them to read at home so that they bring some information with them when they come to class.

Noom-ura (2008) asserts, in an EFL situation, time allocation for English learning may need reconsideration if students are expected to reach a high level of proficiency. However, the possibility for providing more class time in a Thai educational context might be very slim. Therefore, it might be a better idea to balance designed activities with the time available.

5.5.2 Authentic reading texts from the Internet can be employed with a class of students with different levels of English language proficiency.

Based on the research findings, the participants encountered with too many difficult lexical items and too many reading texts for them to manage. It is true that too many resources can discourage students, especially those who are less able. Too many resources can overwhelm them because they have never been exposed to a lot of reading materials like this before. Some never try them at all because it takes

time for them to read. Others lose their enthusiasm for the activities. In this study, when the teacher pointed out that they did not have to read all texts in order to gather the needed information, and that they could be selective as there were several readings with different levels of difficulty, the students felt happier because they were more confident that they could finish the reading texts to find the information needed for the task within the class time. It can be seen that the data from students' logs revealed that fewer students complained about insufficient time for reading at the end of the course. Additionally, some students told the teacher that they had explored more web links and they found that there were some links with the same topics or contents that they could understand. This encouraged them to read additional texts.

It can be seen that authentic reading texts from the Internet can serve a variety of students' needs and levels of proficiency. Not only did less able students gain the benefits of selecting easy texts to read, but more able students are also challenged to read longer and more difficult and complicated texts. This can be done by setting one or two difficult questions for students to read for comprehension.

In conclusion, because students in one class usually have a range of skills and language proficiency, teachers are often concerned with how to select appropriate reading materials for students. Providing a wide variety of reading texts with different difficulty levels can serve all students.

5.5.3 WebQuests can be employed to promote students' learning engagement.

In doing WebQuest tasks, students need to help each other to perform the task. Student interaction is embedded through the group dynamic. Instead of being passive listeners in traditional classroom, cooperative learning environment places the students into a situation where interaction is needed. Based on the results of the study, the students enjoyed doing class activities with their group members. They asked questions to the teacher and their peers more often during the class activities. The finding was supported by the positive effect of cooperative learning on students' active involvement in the process of learning which was found in a study of Kwangsawad (2005). He reports that cooperative learning encouraged his students

to become more responsible and more actively involved in the learning process. The majority of students seemed to be more satisfied with their new roles of active learners, and they liked this friendly and cooperative learning atmosphere. In addition, cooperative learning could also lower the students' anxiety in the way that it allowed the teacher to use various forms of assessment instead of using only tests. With regard to the potential of cooperative learning in WebQuests, it could be seen that such active learning environment could lead to students' active participation in the learning process.

5.5.4 Student motivation to learn has an important role in student learning engagement.

"When students are motivated to learn they not only put in more effort, but their minds are more alert and ready to make connections" (March, 2002: 3).One of the promising advantages of WebQuest is that it promotes learners' motivation. Students are more likely to be motivated when they are exposed to real resources and real world tasks. In this study, there are many things in WebQuests that help increase students' motivation to learn: the use of technology (Murray, 2005), cooperative learning, and authentic tasks (March**,** 2002). It is necessary to motivate the students at the very beginning of the instruction. When they are motivated, they are willing to participate in class activities and more likely to put more effort in every steps of the instructional process.

Research has indicated that motivation is closely related to student engagement. According to Cunningham & Cunningham (2002: 89), "engaged learners" can be defined as those who "work in motivated way; that is, they employ whatever skills and strategies they have with effort, persistence, and an expectation of success." These motivated learners are likely to develop self-confidence, try new strategies when they experience failure or difficulty, and come to see the activity as pleasurable.

5.5.5 Teacher's supportive role and peer relationship are important for student learning and their engagement.

Many Thai students have negative perceptions of the teacher's role as an untouchable person. Some of them never asked questions due to the fear of loosing face. This can cause passive learning behaviors or learning resistance. In WebQuest classes, the teacher acted as a facilitator in the learning process and the central idea of WebQuest was scaffolding. The teacher provided assistance as she monitored the group activity and encouraged students to give a try on reading and writing strategies. Based on the findings of the study, students felt confident when learning because the teacher helped them when they had problems, and they become more engaged as they felt that the teacher was very friendly and supportive. It could be seen that the teacher's supports had significant effects on students' learning. Based on Vygotsky's view, the role of teachers in learning is to guide their students to pay attention to and concentrate on what they are learning. Through teacher's guidance students can go beyond their actual capacity (Sutherland, 1992).

In classrooms, teachers are central to student engagement in learning. Research findings have shown that students respond more positively when classes are taught by teachers who care about them, respect them, do not put them down, are fair and supportive, have fun with them, and do not give up on them. Teacher responsiveness has been found to have a significant effect on Australian primary and secondary students' attitudes toward to school (emotional engagement), attentiveness (behavioral and cognitive engagement) and, through these, on achievement (Hill, et al., 1996).

Additionally, peer relationship is also important for student engagement. Students are more likely to contribute to the group tasks because they have good relationships with their friends. An exploratory investigation on student engagement at Illinois State University carried out by Farmer-Dougan & McKinney (2001) has revealed that peer relationship was one important variable that affected the level of student engagement. The data showed that students who reported a higher ability to deal with other students also tended to be highly engaged, whereas those who had difficulties getting along with peers in small group work or during class discussion were less likely to be engaged. The researchers concluded that skills to create

positive peer relationship may directly impact the degree to which students are engaged in their learning process.

5.6 Recommendations for Further Studies

Web-based English as a foreign language teaching is still a new phenomenon in some education area in Thailand. The literature review supports the assertion that the Web-based Instruction is a growing trend. This study used WebQuest modules as an example to examine the effectiveness of the implementation of Web-based instruction in a context of foreign language teaching and learning.

The collected data provided a lot of useful information to evaluate the WebQuest value to enhance English language reading and writing skills as well as increase student engagement to create more active learning environment. It is helpful to be able to improve the students' reading and writing abilities through the implementation of the WebQuest lessons. This may encourage those who want to try on an efficient supplement of the traditional classroom teaching. It makes the teaching interesting and motivating for the students, for example. The followings are some recommendations for further research studies.

1. This research study used a one-group, pre-test post-test design. This design is considered a weak design for experimental research. Consequently, the findings might not be generalizable to the population. It is recommended that similar studies should be conducted with a true experimental research design with a control group and an experimental group as well as random assignment so that the research could provide stronger empirical evidence on the effectiveness of the implementation of WebQuest lessons to improve EFL reading and writing achievement.

2. With regard to data collection, those who would like to replicate this research study might take the following issues into consideration. First, instead of using the same pre- and post-test, an equivalent form of the test could be employed in order to avoid the practice effects. Second, a delayed post-test is recommended for investigating the effectiveness of the treatment on students' English reading and writing abilities overtime and their knowledge retention.

3. It was found that WebQuest is an approach that can take full advantages out of the Internet resources. In the framework of WebQuest, resource links were

used to gather information in order to be employed in completing the task. When students were exposed to these real or authentic reading resources, they were simultaneously exposed to a large amount of vocabulary knowledge, content background, and a wide variety of samples for well-organized writing compositions.

4. Apart from the wealth of reading resources, the Internet could also provide rich resources for English listening and speaking practice. As a result, WebQuest might be advantageous to enhance these two language skills as well. It is interesting to conduct research in order to determine if and how WebQuests can be used to improve English listening and speaking skills or what is the effective way to combine the WebQuests or other web-based activities into the classroom practice in order to develop listening and speaking skills of other EFL students.

REFERENCES

Ainley, M. (2004). What do we know about student motivation and engagement? [Online]. Available from: http://www.aare.edu.au/04pap/ain04760.pdf [2006, September 20]

Abbitt, J. and Ophus, J. (2008). What we know about the impacts of WebQuests: A review of research. AACE Journal 16(4): 441-456.

Adams, A. and Brindley, S. (Eds.). (2007). Teaching Secondary English with ICT. Berkshire: McGraw Hill.

Alan, B. and Stoller, F.L. (2005). Maximizing the benefits of project work in foreign language classrooms. English Teaching Forum 43(4): 10-19.

Alderson, J.C. (2000). Assessing reading. Cambridge: Cambridge University Press.

Alderson, J.C. and Banerjee, J. (2002). Language testing and assessment (Part 2). State-of-the Art Review 35: 79-113.

Aldred, S. (2004). E-learning: A learning journey of effective e-learning through learning engagement. [Online]. Available from: http://e-learning-engagement.blogspot.com/2004 [2006, September 20]

Ally, M. (2004). Theory and Practice of Online Learning. [Online]. Available from: http://cde.athabascau.ca/online_book/ch1.html [2006, September 20]

Artidtieng, W. (2005). M-Learning as a Tool to Upgrade Knowledge. In Workshop Report International Workshop on Mobile Learning for Expanding Educational Opportunities (16-20 May 2005) Tokyo, Japan [Online]. Available from: http://www.unescobkk.org/fileadmin/user_upload/ict/e-books/M-Learning/Annexes.pdf [2006, September 20]

Bitter, G. and Legacy, J. (2006). Using Technology in the Classroom. (Brief Edition). Boston: Pearson Education, Inc.

Bachman, L. and Palmer, A. (1996). Language testing in practice: designing and developing useful language test. Oxford: Oxford University Press.

Bernhardt, E. (1991). Reading development in a second language: Theoretical empirical, and classroom perspectives. Norwood, NJ: Abex.

Boling, N. and Robinson, D. (1999). Individual study, interactive multimedia, or cooperative learning: Which activity best supplements lecture-based distance education. Journal of Educational Psychology 91: 169-174.

Brown, H.D. (1994). Teaching by principles: An interactive approach to language pedagogy. New Jersey: Prentice Hall Regents.

Brown, J.D. (1995). The elements of language curriculum: A systematic approach to program development. Boston: Heinle & Heinle.

Brown, H.D. (2004). Language assessment principles and classroom practice. New York: Pearson Education Inc.

Burke, M. et al. (2003). BioWebQuest: Evaluating the effectiveness of a "WebQuest" model of inquiry learning in a Biology sequence for non-science majors. [Online]. Available from: http://www.campus-technol14.pdf [2006, July 7]

Burton, J., Daroon, Y., Raimaturapong, A. and Siripong, S. (2004). Educational renewal and EFL curriculum practice in Thailand. In Murray, D. (ed.), Planning Change-Changing Plans, pp. 11-15. Mahwah, New Jersey: The University of Michigan Press.

Camacho, G.Z. (2005). Literacy memoirs: Involving students in meaningful writing. English Teaching Forum 43(3): 28-35.

Carrell, P.L. and Grabe, W. (2002). Reading. In Schmitt, N. (ed.), An introduction to applied linguistics, pp. 233-250. New York: OUP.

Chapman, E. (2003). Alternative approaches to assessing student engagement rates. Practical Assessment, Research & Evaluation [Online]. Available from: http://PAREonline.net/getvn.asp?v=8&n=13 [2008, April 3]

Chinnery, G.M.(2005). Speaking and listening online: A survey of Internet resources. English Teaching forum 43(3): 10-17.

Chuo, T.W.I. (2007). The effect of the WebQuest writing instruction program on EFL learners' writing performance, writing apprehension, and perception. TESL-EJ [Online]. Available from: http://tesl_ej.org/ej43/a3.html [2008, March 14]

Clark, A. (1996). Glossary of CBT/WBT terms. [Online]. Available from: http://www.clark.net/pub/nractive/alt5.htm [2006, August 22]

Cohen, A.D. (1994). Assessing language ability in the classroom. (Second edition). Boston: Heinle & Heinle Publishers.

Davis, R.A. (2003). Using WebQuests as a tool to teach literacy skills. The 5th CULI International Conference Selected Papers (CULI's 2003 International Conference): 17-40.

Debski, R. and Gruba, P. (1999). A qualitative survey of tertiary instructor attitudes towards project-based CALL. Computer Assisted Language Learning 12 (3): 219-239.

De la Fuente, M.J. (2003). Is SLA interactionist theory relevant to CALL?: A study on the effects of computer-mediated interaction in L2 vocabulary acquisition. Computer assisted language learning 16(1): 47-81.

Dodge, B. (1995). Some thoughts about WebQuests. [Online]. Available from: http://webquest.sdsu.edu/about_webquests.html [2006, August 5]

Dodge, B. (1999). WebQuest process checklist. [Online]. Available from: http://projects.edtech.sandi.net/staffdev/tpss99/finepoints/index.htm [2006, August 5]

Dodge, B. (2001). WebQuest rubric. [Online]. Available from: http://webquest.sdsu.edu/webquestrubric.html [2006, August 8]

Dodge, B. (2001). A WebQuest of WebQuests. [Online]. Available from: http://webquest.sdsu.edu/webquestwebquest.html [2006, August 20]

Dodge, B. and March. T. (1997). Some thoughts about WebQuests. [Online]. Available from: http://www.edweb.sdsu.edu/courses/edtec596/about_WebQuests.html [2006, August 8]

Dornyei, Z. (1997). Psychological processes in cooperative language learning: Group dynamics and motivation. The Modern Language Journal 81(4): 482-493.

Douglas, D. (2000). Assessing languages for specific purposes. New York: CUP.

Dudeney, G. (2003). The quest for practical web usage. TESL-EJ [Online]. Available from: http://tesl-ej.org/ej24/int.html [2007, July 14]

Egbert, J. and Hanson-Smith, E. (Eds). (1999). CALL Environment: Research, Practice, and Critical Issues. Bloomington: TESOL.

Farmer-Dougan, V. and McKinney, K. (2001). Examining student engagement at Illinois State University: An exploratory investigation. [Online]. Available from: http://www.teachtech.ilstu.edu/resources/teachTopics/examEngage.php [2006, August 8]

Felix, U. (2001). The web's potential for language learning: The student's perspective the importance of a user-centered design approach for CALL. ReCALL 13(1): 47-58.

Fiedler, R.F. (2002). WebQuests: A critical examination in light of selected learning theories. [Online]. Available from: http://www.portalwebquest.net/pdfs/wqacritical.pdf [2006, August 8]

Fluck, A.E. (2001). Some national and regional frameworks for integrating information and communication technology into school education. Educational Technology & Society [Online]. Available from: http://www.ifets.info/journals/4_3/fluck.pdf [2006, August 8]

Genesee, F. et al. (2006). Educating English Language Learners. New York: Cambridge University Press.

Gibbons, P. (2003). Mediating language learning: teacher interactions with ESL students in a content-based classroom. TESOL Quarterly 37(2): 247-273.

Gillies, R. M. and Ashman, A. F. (1998). Behavior and Interactions of Children in Cooperative Groups in Lower and Middle Elementary Grades. Journal of Educational Psychology 90(4): 746-757.

Grabe, W. (2002). Dilemmas for the development of development of second language reading abilities. In Richards J.C. & Renandya, W.A. (Eds), Methodology in language teaching: An Anthology of current practice, pp. 276-286. New York: CUP.

Grabe, W. (2004). Research on teaching reading. In McGroarty, M. (Ed.), Annual review of applied linguistics Vol. 24: Advances in language pedagogy, pp. 44-69. New York:CUP.

Grabe, W. and Kaplan, R.B. (1996). Theory & practice of writing: An applied linguistic perspective. New York: Longman.

Grabe, W. and Stoller, F.L. (2002). Teaching and researching reading. London: Pearson Education.

Graves, K. (2000). Designing language courses: A guide for teachers. Boston. MA: Heinle & Heinle.

Grisham, D. (2001). Making technology meaningful for literacy teaching: A WebQuest. [Online]. Available from: http://www.readingonline.org/editorial/february2001/index.html [2007, September 24]

Gunning, T.G. (2006). Assessing and correcting reading and writing difficulties. (Third edition). New York: Pearson Education, Inc.

Handson-Smith, E. (1997). Technology in the classroom: Practice and promise in the 21st century. TESOL Professional Papers # 4 [Online]. Available from: http://www.tesol.org/pubs/catalog/downloadable/hanson-smith-2.html [2007, June 20]

Hassanien, A. (2006). Using WebQuest to support learning with technology in higher education. Journal of Hospitality, Leisure, Sport and Tourism Education [Online]. Available form: http://www.heacademy.ac.uk/assets/hlst/documents/johlste/vol5no1/0096.pdf [2008, October 22]

Healey, D. (1999). Teaching reading skills with technology. In Egbert, J. and Hanson-Smith, E. (Eds.), CALL environment: Research, practice, and critical issues, pp.116-136. Alexandria, VA: TESOL.

Healey, D. (2003). I'm running as fast as I can, but I'm still in the same place! Keeping up with technology. The 5th CULI International Conference Selected Papers (CULI's 2003 International Conference): 71-83.

Hemard, D. and Cushion, S. (2001). Evaluation of a Web-based language learning environment: The importance of a user-centered design approach for CALL. ReCALL 13(1): 15-31.

Henke, H. (2001). Evaluating Web-Based Instructional Design. [Online]. Available from: http://www.chartula.com/evalwbi.pdf [2007, August 16]

Hu, M. and Nation, P. (2000). Unknown vocabulary density and reading comprehension. Reading in a foreign language 13: 403-430.

Hull, L. (1996). A curriculum framework for corporate language programs. In Graves, K., Teachers as course developers, pp. 176-202. New York: Cambridge University Press.

Hutchinson, T. and Waters, A. (1987). English for specific purposes: A learner-centered approach. Cambridge: Cambridge University Press.

Hwu, F. (2006). Learners' behaviors in computer-based input activities elicited through tracking technology. Computer Assisted Language Learning 16 (1): 5-29.

Isaac, S. and Michael, W. (1981). Handbook in research and evaluation. (Second edition). San Diego, California: EdITS.

Janzen, J. (2002). Teaching strategic reading. In Richards J.C. and Renandya, W.A. (Eds.), Methodology in language teaching: An Anthology of current practice, pp. 287-294. New York: CUP.

Johnson, D. and Zufall, L. (2000). Not just for kids anylonger: WebQuests for professional development. [Online]. Available from: http://www.readingonline.org/electronic/webwatch/webquests/ [2007, January 23]

Jones, S. (2005). From passive note-taking and lectures to WebQuest in higher education: Understanding the importance and how to create one. [Online]. Available from: http://asstudents.unco.edu/students/AE-Extra/2005/6/Art-2.html [2007, June 4]

Kaplan, R. (2002). The Oxford handbook of applied linguistics. Oxford: OUP.

Kasper, L. (1995). Theory and practice in content-based ESL reading instruction. English for Specific Purposes 14(3): 223-230.

Kearsley, G. and Shneiderman, B. (1999). Engagement theory: A framework for technology-based teaching and learning. [Online]. Available from: http://home.sprynet.com~gkearsley/engage.htm [2006, September 21]

Khan, B.H. (Ed.). (1997). Web-based instruction. [Online]. Available from: http://www.hbg.psu.edu/bsend/intro/docs/idguide [2006, September 21]

Kwangsawad, T. (2005). Content-based instruction in the EFL context. Thai TESOL Bulletin 18(1): 80-92.

Lake, M. (2003). Learner centered EFL exams & grading: A classroom study of effectiveness. The 5th CULI International Conference Selected Papers (CULI's 2003 International Conference): 84-107.

Lamb, A. and Teclehaimanot, B. (2005). A decade of WebQuests: A retrospective. In Orey, M., McClendon, J. and Branch, R.M. (Eds.), Educational media and yearbook: Volume 30, Eaglewood: Libraries Unlimited.

Lara, S. and Reparaz, C. (2005). Effectiveness of cooperative learning: WebQuest as a tool to produce scientific videos. [Online]. Available from: http://www.formatex.org/micte2006/ [2006, September 20]

Laufer, B. (1989). What percentage of text-lexis is essential for comprehension? In Lauren, C. and Nordman, M. (Eds.), Special language: From humans thinking to thinking machines, pp. 316-323. Clevedon and Philadelphia, PA: Mutilingual Matters.

Leeds, B. (2003). How to teach EFL/ESL writing: A basic guide for Thai teachers. PASAA 34: 80-102.

Leite, M., McNulty, A., and Brooks, D.M. (2005). Learning from WebQuests. [Online]. Available from: http://center.uoregon.edu/ISTE/uploads/NECC2005/KEY_6494838/Leite_Learning_from_WebQuests_RP.pdf [2006, September 20]

LeJeune, N. and Richardson, K. (1998). Learning theories applied to Web-based instruction. [Online]. Available from: http://ouray.cudenver.edu/~nflejeun/doctoralweb/Couurses/EPSY6710 [2006, September 20]

Linn, R.L. and Gronlund, N.E. (2000). Measurement and assessment in teaching. (8th edition). New Jersey: Prentice-Hall Inc.

Luke, C.L. (2006). Fostering learner autonomy in a technology-enhanced, inquiry-based foreign language classroom. Foreign language annals 39(1): 71-86.

March, T. (1998). The WebQuest design processes. [Online]. Available from: http://www.ozline.com [2006, September 20]

March, T. (1998). WebQuests for learning. [Online]. Available from: http://www.ozline.com/webquest/intro.html [2006, September 20]

March, T. (2000). The 3R's of WebQuests: Let's keep them Real, Rich, and Relevant. [Online] Available from: http://www.ozline.comPtyLtd [2006, September 20]

Marco, M.J.L. (2002). Internet-Based Activities for English for Specific Purposes. English Teaching Forum 40(3): 20-25.

McLeod, S.A. (2007). Simply psychology. [Online]. Available from: http://www.simplypsychology.pwp.blueyonder.co.uk [2008, December 22]

McLoughlin, C. and Luca, J. (2000). Cognitive engagement and higher order thinking. Teaching and learning forum [Online]. Available from: http://otl.curtin.edu.au/tlf/tlf2000/mcloughlin.html [2006, July 24]

McShane, M. (2006). Redefining "Paradigm" for computer-aided language instruction. Foreign Language Annals 36(2): 198-207.

Medley, M. (2004). The theory of constructivism. [Online]. Available from: http://www.4faculty.org/includes/110r1.jsp [2008, December 23]

Miller, S.M. and Miller, K.L. (1999). Using instructional theory to facilitate communication in Web-based course. Educational Technology & Society [Online]. Available from: http://www.ifets.info/journals/4_3/miller_miller.pdf [2007, August 4]

Moallem, M. (2001). Applying constructivism and objectivist learning theories in the design of a Web-based course: Implications and practice. Educational Technology & Society [Online]. Available from: http://www.ifets.info/journals/4_3/moallem.pdf [2007, August 4]

Murray, D. (2005). Technology for second language literacy. In McGroarty, M. (Ed.), Annual Review of Applied Linguistics: A Survey of Applied Linguistics, pp. 188-201. New York: CUP.

Murray, D. and McPherson, P. (2004). Using the Web to support language learning. Sydney: Ligare Pty, Ltd.

Murphy, E. (1997). Characteristics of Constructivist Learning & Teaching. [Online]. Available from: http://www.ucs.mun.ca/~emurphy/stemnet/cle3.html [2008, December 23]

Nguyen, D.M. and Kulm, G. (2005). Using Web-based practice to enhance mathematics learning and achievement. Journal of Interactive Online Learning [Online]. Available from: http://www.ncolr.org [2006, June 4]

Nunan, D. (1992). Research method in language learning. Cambridge: Cambridge University Press.

Nunan, D. (1989). Designing tasks for communicative classroom. Glasglow: Cambridge University Press.

Nunan, D. (2002). Practical English language teaching. Singapore: McGrawHill.

Nunan, D. (2003). English in the era of globalization. The 5th CULI International Conference Selected Papers (CULI's 2003 International Conference): 108-114.

Office of the Prime Minister. (1999). National Education Act of B.E. 2542. Bangkok: Office of the National Education Commission.

Orlich, C. et al. (1998). Teaching strategies: A guide to effective instruction. Boston: Houghton Mifflin Company.

Oxford, R.L. (1997). Cooperative learning, collaborative learning, and interaction: Three communicative strands in the language classroom. The Modern Language Journal 81(4): 443-456.

Pala, O. (2005). Teaching listening and reading comprehension in Turkish using Web-based materials. [Online]. Available from: http://babel.uoregon.edu/ylc/selfstudy/turkish/lessons/Project.pdf [2007, March 7]

Pennington, M. C. (2004). Cycles of innovation in the adoption of information technology: A view for language teaching. Computer Assisted Language Learning 17(1): 7-33.

Peterson, C.L., Caverly, D.C., and McDonald, L. (2003). Developing academic literacy through WebQuests. Journal of Developmental Education 26(3): 38-39.

Pigada, M. and Schmitt, N. (2006). Vocabulary acquisition from extensive reading: A case study. Reading in a Foreign Language [Online]. Available from: http://nflrc.hawaii.edu/rfl/April2006/pigada/pigada.html [2006, August 3]

Pitiyanuwat, S. and Anantrasirichai, A. (2002). Curriculum and learning reform in Thailand. [Online]. Available from: http://www.onesqa.or.th//79/FileUpload/2031_5347.pdf [2007, March 7]

Prapphal, K. (2001). Self-evaluation of language skills and non-linguistic factors through WWW and e-mail tasks. PASAA 32: 36-51.

ProvenZo, E.F. (2005). The Internet and Online Research for Teachers. (Third edition). Boston: Pearson.

Raimaturapong, A. (2004). English for Thai engineering communities: Curriculum renewal pathways for English for specific purposes teachers. (Research portfolio submitted in fulfillment for the Degree of Doctor of Education). Adelaide: University of South Australia.

Raimes, A. (2002). Ten steps in planning a writing course and training teachers of writing. In Richards, J.C. & Renandya, W.A. (Eds.), Methodology in language teaching: An Anthology of current practice, pp. 306-314. New York: CUP.

Renandya, W.A. and Jacobs, G.M. (2002). Extensive reading: Why aren't we all doing it?. In Richards, J.C. & Renandya, W.A. (Eds.), Methodology in language teaching: An Anthology of current practice, pp. 295-302. New York: CUP.

Richards J.C. (2006). Materials development and research-making the connection, RELC 37(1): 5-26.

Richards, J.C. and Renandya, W.A. (Eds.). (2002). Methodology in language teaching: An Anthology of current practice. New York: CUP.

Richardson, J. and Newby, T. (2004). Students' cognitive engagement in online learning environments: learning strategies and motivation. [Online]. Available from: http://www.editlib.org/p11649 [2007, June 4]

Ruschoff, B. and Ritter, M. (2001). Technology-enhanced language learning: Construction of knowledge and template-based learning in the foreign language classroom. Computer Assisted Language Learning 14(3-4): 219-232.

Savin-Baden, M. and Wilkie, K. (2006). Problem-based Learning Online. NewYork: Oxford University Press.

Seow, A. (2002). The Wrting process and process writing. In Richards, J.C. and Renandya, W.A.(Eds.), Methodology in Language Teaching: An Anthology of Current Practice, pp. 315-320. New York: CUP.

Sheldon, L.E. (1988). Evaluating ELT textbooks and materials. ELT Journal 42(4): 237-246.

Shiratuddin, N. (2001). Internet instructional method: Effects on students' performance. Educational Technology & Society 4(3): 72-76.

Skinner, E.A. and Belmont, M.J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. Journal of Educational Psychology 85(4): 572-583.

Smith, D.G. and Baber, E. (2005). Teaching English with information technology. London: Modern English Publishing, Ltd.

Soja, C. M., and Huerta, D. (2001). Debating whether dinosaurs should be "cloned" from ancient DNA to promote cooperative learning in an introductory evolution course. Journal of Geoscience Education 49(2): 150-157.

Solis, A. (2008). Teaching for Cognitive Engagement Materializing the Promise of Sheltered Instruction [Online]. Available from: http://www.idra.org/IDRA_Newsletter/April_2008_Student_Engagement/Teaching_for_Cognitive_Engagement/ [2006, August 3]

Stahl, R. J. (1994). Cooperative learning in social studies: A handbook for teachers. Menlo Park, CA: Addison-Wesley.

Stoney, S. and Oliver, R. (1999). Can higher order thinking and cognitive engagement be enhanced with multimedia?. IMEj [Online]. Available from: http://imej.wfu.edu/Articles/1999/2/07/index.asp [2006, August 3]

Strickland, J. (2005). Using WebQuests to teach content: Comparing instructional strategies. Contemporary Issues in Technology and Teacher Education 5(2): 138-148.

Sutherland, P. (1992). Cognitive development today: Piaget and his critics. London: Paul Chapman Publishing.

Sysoyey, P.V. (2000). Developing an English for specific course using a learner centered approach: A Russian experience. The Internet TESL Journal [Online]. Available from: http://iteslj.org/Techniques/Sysoyev-ESP.html [2008, October 20]

Taylor-Powell, E., Steele, S., and Douglah, M. (1996). Program development and evaluation: Planning a program evaluation. [Online]. Available from: http://learningstore.uwex.edu/assets/pdfs/G3658-1.pdf [2008, November 4]

Teeler, D and Gray, P. (2000). How to use the Internet in ELT. Malaysia: Pearson Education Limited.

Tessema, K.A. (2005). Simulate writing through project-based tasks. English Teaching Forum 4(4): 22-28.

Tharp, R. G., and Gallimore, R. (1988). Rousing minds to life: Teaching, learning, and schooling in social context. Cambridge: Cambridge University Press.

Timucin, M. (2006). Implementing CALL in an EFL context. ELT Journal 60(3): 262-271.

Tomlinson, B. (1998). Materials Development in Language Teaching. Cambridge Language Teaching Library: CUP.

Towndrow, P. (1999). The impact of digital education on TESOL. Computer Assisted Language Learning 12(2): 157-162.

Tribble, C. (1996).Writing. Oxford: OUP

Tsai, S.H.E. (2005). The effect of EFL reading instruction by using a WebQuest learning module as a CAI enhancement on college students' reading performance in Taiwan. Idaho State University: AAT 3193423

Poel, K. (2009). Effects and effectiveness of language course evaluation: A case study needs, program development, and evaluation. [Online]. Available from: http://www.ou.nl/Docs/Campagnes/ICDE2009/Papers/Final_paper_061vanderpoel.pdf [2008, November 4]

Vanguri et al. (2004). WebQuests in social studies education. Journal of interactive online learning [Online]. Available from http://www.ncolr.org/jiol/issues/PDF/3.2.5.pdf [2007, August 7]

Vygotsky, L.S. (1962). Thought and language. Cambridge. MA: MIT Press.

Vygotsky, L.S. (1978). Mind in society: The development of higher psychological Processes. Cambridge: Cambridge University Press.

Warschauer, M. (1996). Computer assisted language learning: An introduction. In Fotos, S. (Ed.), Multimedia Language Teaching, pp.3-20. [Online]. Available from: http://www.gse.uci.edu/faculty/markw/call.html [2006, August 3]

Warschauer, M. (2002) A developmental perspective on technology in language education. TESOL Quarterly 36(3): 453-475.

Warschauer, M. and P.E. Whittaker. (1997). The Internet for English teaching: Guidelines for teachers. The Internet TESL Journal [Online]. Available from: http://itesl.org/Articles/ Warschauer-Internet.html [2007, August 1]

Water, A. and Vilches, M.L.C. (2005). Managing innovation in language education: A course for ELT change agents. RELC 36(2): 117-136.

Wegerif, R. and Dawes, L. (2004). Thinking and Learning with ICT. London: RoutledgeFalmer.

Wegner, S.B., Holloway, K.C. and Garton, E.M. (1999). The effects of Internet-based instruction on student learning. JALN 3(2): 98-106.

Whattananarong, K. (2002).The effects of Internet-based teaching and learning systems on learners. Department of Technological Education. King Mongkut's Institute of Technology North Bangkok.

Wui, L.S. and Saat, R.M. (2008). An evaluation of nutrition WebQuest: The Malaysian experience. [Online]. Available from: http://www.ejmste.com/v4n2/Eurasia_v4n2_Wui.pdf [2008, December 12]

Yang, L. and Wilson, K. (2006). Second language classroom reading: A social constructivist approach. The Reading Matrix [Online]. Available from: http://www.readingmatrix.com/articles/yang_wilson/article.pdf [2008, December 23]

Young, L.D. (2003). Bridging theory and practice: Developing guidance to facilitate the design learning environment. Canadian Journal of Learning and Technology [Online]. Available from: http://www.cjlt.ca/content/vol29.3cjlt29-3 art4 .html [2006, August 3]

APPENDICES

Appendix A

Sample of WebQuest Modules (Part 1)

Module 1: Global Warming! (Cause/Effect)

Introduction | Task | Process | Resources | Evaluation | Conclusion |

Introduction:

Have you ever heard that it will snow in Thailand? Have you heard that the polar ice caps are melting and sea level is rising? Have you heard that global warming crisis is getting worse? Global warming is becoming a serious concern for all inhabitants of the planet Earth. Gradually over the years, our climate has been warming up. Even a minor change in the Earth's temperature of only a few degrees will result in dramatic changes to our climate.

In Thailand, many agents are now realizing that global warming can bring about negative effects to our inhabitants and environment. There is an urgent need to educate our people on the issues of the causes of global warming and its consequences so that we can be safe from the disastrous effects.

The Task:

As part of a research project on global warming, your team, consisting of you and other specialists on climate change, are assigned by the government to study the effects that global warming will have on the Earth, especially on our country Thailand in the future. You have to find out whether our planet is really warming up. If so, what if anything should be done? You will gather information from the Internet and report your information.

You and your teammates will have to write a report to the government on the causes and effects of this issue as well as what we can do today to make sure that future inhabitants of our country will be safe from the disastrous consequences of global warming. You also have to convince the readers of your report that being aware of the problem is not enough, but we should be doing more in solving this global issue.

The Process:

Step 1: You and your team will be responsible for creating a brochure on “Global Warming Crisis Campaign". You will go to the resource part and find information on what global warming is and what are its causes, what the consequences of global warming are, and what can be done about it now so that we can solve this environmental issue and finally save our country.

Step 2: Get together with the other members of your group and decide who is going to gather what information which is needed for the report.

Step 3: You are required to use at least three different sources of information in the development of the report. In other words, you are expected to use at least three different web sites for researching Global Warming. Your sources of information on Global warning do not have to be limited to online resources. Books or brochures can also be used. In this case, please state the references.

Step 4: While gathering the information from the websites, don’t forget to answer the questions in the handouts to help you get the main points for your writing report.

Step5: Get together again and share what you have got from reading the articles on global warming. After that, brainstorm among your team members in order to develop a plan for your report, then write, and revise it.

Step 6: Using a word processor, begin to write the report. Keep in mind that the first part of your report will introduce the reader to the problem of global warming and its causes. The second part of the report will describe the effects of global warming, and the third part will describe what we can do to solve this problem. Don’t forget to refer back to the language focus for the essay plans.

Resources

Use the following websites to gather the information needed for accomplishing the task.

Global Warming in Thailand
http://www.consequencesofglobalwarming.com/countries/global-warming-thailand.html

Global Warming Effects and Causes
http://planetsave.com/blog/2009/06/07/global-warming-effects-and-causes-a-top-10-list/

Top 10 Solutions:
http://environment.about.com/od/globalwarming/tp/globalwarmtips.htm

Effects of global warming
http://environment.nationalgeographic.com/environment/global-warming/gw-effects.html

Five deadliest effects of global effects
http://www.environmentalgraffiti.com/sciencetech/5-deadliest-effects-of-global-warming/276
Global warming, will it affect you?
http://library.thinkquest.org/J003411/index.htm

Climate changes
http://www.epa.gov/climatechange/kids/

Causes of global warming
http://library.thinkquest.org/J003411/causes.htm

How can I help?
http://library.thinkquest.org/J003411/help.htm

Things you can do to reduce global warming.
http://environment.about.com/od/globalwarming/tp/globalwarmtips.htm

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Evaluation

An evaluation rubric form has been developed to assist in the evaluation of learning with this WebQuest module. Click here to see **the evaluation rubric**.

Conclusion

You have reached a final goal of writing a report explaining the causes and effects of global warming as well as suggesting solutions for this environmental issue. Due to this research that you and you team have done, do you really believe that this can be a serious problem for our planet and of course for our country and our people. You can pass on this message from your report to people around you to help protect our environment.

Rubrics for evaluating the writing task (Cause/ effect essay)

Task Components	4 points	3 points	2 points	1 point
I. Introduction	Creatively begins with and interesting lead that addresses the central idea	Begins with and interesting lead that addresses the central idea	Begins with an opening lead but addresses only some information related to the central idea	Begins with an opening lead but does not address the central idea
II. Organization	Effectively and accurately organizes the writing in the correct cause/effect composition elements	Accurately organizes the writing in the correct cause/effect composition elements	Organizes the writing in a cause/effect composition pattern but varies the pattern throughout the writing	The writing is organized into a pattern that does not explain any of the causes or effects related to the topic
III. Supporting main idea	Provides well developed and appropriate evidence to support each component being stated causes and effects	Provides adequate support for each component being stated causes and effects	Provides some support that is accurate but has some inaccurate support for the components being stated causes and effects	Provides little support for the components being stated causes and effects
IV. Conclusion	Constructs a thorough closure to the writing that is relevant to the opening lead	Constructs an appropriate closure to the writing that follows logically from the opening lead	Constructs a closure that somewhat follows logically from the opening lead, and may not fully explained	Constructs a closure that does not follow logically from the opening lead
V. Grammar and mechanics	Consistently uses correct grammar and mechanics	Usually uses correct grammar and mechanics	Occasionally makes errors in grammar and mechanics that interfere with reading the essay	Frequently makes distracting errors in grammar and mechanics

Handout 1
Global Warming: A Cause and Effect
Reading and Writing Lesson

(A) Preparing to read

Cause and effect shows the relationship between two things when one thing makes the other thing happen. If you can put the two things into a sentence using "if.... then...", then you have the requirements for cause and effect. For example: If you throw a ball up, then it will fall back down. In this case, throwing the ball up is the cause for it to fall down.

Here are some examples of cause and effect relationships.
save money -------> travel abroad
eat too much -------> get fat
study politics -------> become a lawyer
stay out in the sun too much -------> get a sun burn

Exercise 1: Using your notes and worksheet from the reading(s), write as many cause and effect relationships as you can think of regarding global warming and the greenhouse effect.
------->
------->
------->
------->
------->
------->
------->
When we write cause and effect statements, we use words and phrases that are called connectors of result.

Connectors of result:

so, therefore, consequently, as a result, for this (these) reason(s)

Examples:

She saved her money for more than one year, so now she is planning to travel abroad.

Last year, MIC students in England ate too much greasy food. As a result, they got fat.

He studied politics; therefore, he became a lawyer.

Exercise 2:

Connect your ideas from exercise one with complete sentences. Use all the connectors of result at least once.

(B) Preparing to write

Organizing

There are two main ways to organize cause and effect compositions. One way is the group approach. In this way, you talk first about all the causes together as a group, then you talk about all the effects as a group. The other way to organize cause and effect writing is the alternating chain approach. In this way, you first discuss a cause and its effect. Then you discuss another cause and its effect, and so on.

Which is best?

At first, you might not know which approach is best for your topic. In general, if it is difficult to make a clear distinction between cause and effect, the group approach is probably best. On the other hand, if there is a direct relationship between cause and effect, each cause has a clear effect, then the alternating chain approach might be better. In many cases, you might want to combine both types at different times. First you must get your ideas down on paper and then you will see which approach seems best for you.

Exercise 3: Brainstorming

Look again at your notes and sentences about Global warming and the Greenhouse effect. In our last class, you already separated the causes and the effects of Global warming. This time, we are going to group them so they are easier to work with. Using the group approach, think first of all the causes of global warming, and then think of the effects. To do this, ask yourself why? as you list the causes. Then ask yourself what is the result of this? as you list the effects.

Global Warming

A. Causes (Why do we have global warming?)
1.
2.
3.
4.

B. Effects (What is the result of the above causes?)
1.
2.
3.
4.

Exercise 4: Organization

Group relevant information

- Look at the lists above. Think about the relationship of the items in your lists and arrange them in a reasonable order. Do some causes or effects happen before others? Put each cause and each effect in some kind of order by replacing numbers in your list.

Ask yourself:

- Does each cause have a corresponding effect? If not, you should organize using the group approach. If so, then you are ready to begin thinking of the alternating chain approach.

Alternating chain approach

- Match each cause with its coordinating effect. Again arrange them in a reasonable order.

Exercise 5: Writing more sentences

- When you make a statement such as if global temperatures rise, the level of the sea will rise and this will cause disaster, then you must include examples to support your claim. The connectors listed below will help you connect statements with supporting examples. Using your lists above, write cause and effect sentences supported by examples. Use as many of the following connectors as you can.

Connectors

for example, for instance, such as, one example of this is

(C) Writing: Let's write the first draft

At this point, students should have enough ideas, words, and sentences listed on their worksheet and in their notes to begin writing well organized paragraphs. The teacher should remind them to include examples to support each of their cause and effect relationships. Once the first draft is completed, revise and edit

Resources: The Internet TESL Journal, Vol. II, No. 11, November 1996
http://www.aitech.ac.jp/~iteslj/

Appendix B
Sample of Lesson Plans

Module 1 Lesson Plan
(Global Warming!)

Time: 2 hours per week
Subject: Technical English I
Students: Second year engineering students majoring in Industrial Technology
Topic: Cause and effect
Grammar point: Language structures and vocabulary for describing causes and effects and discourse markers
Skills: Reading & writing skills
Goals: Students develop strategies for reading and writing skills
Objectives: On completion of this module, students will be able to

1. Recognize the language and structure used in describing cause and effect
2. Identify the causes and effects from the reading passages
3. Describe the causes and effects of a situation given.

Step	Time	Tasks (Teacher)	Tasks (Students)	Inter action	Purposes
1	15 mins	<u>Pre-reading:</u> - T introduces the lesson by asking the students whether they have heard about "Global Warming". For ex., What is global warming? What do you know about global warming? (its cause and effect) If the students cannot answer the questions, T will write sentences about the cause and effect of global warming on climate, water resources, etc. and ask them whether they are true or false. For ex., Is it true that the world temperature will increase due to global warming? Is it true that, as a result of global warming, the ice in the north and south poles will melt and many parts of the Earth will be	- Ss answer questions using their background knowledge.	T< >Ss Ss< >Ss	To lead in and introduce Ss to the topic of lesson about cause and effect of global warming. To activate Ss' background knowledge about the topic To pre-teach vocabulary

		flooded? - T asks Ss to study the WebQuest starting from the introduction part and the assigned task in order to determine the final outcome of the lesson; and the process for following the steps to accomplish the task	- Ss read and ask questions	T< > Ss	To explain the objectives of the lesson, to set the purpose for reading, and to make sure students understand the steps in processing the task
2	30 mins	<u>Preparation of the demand of information gathering:</u> - T introduces language for describing cause and effect. T asks Ss to study in the handout (2) along the explanation and do the following exercises. - As a class, T asks Ss to study the sample paragraph showing cause and effect	- Ss practice skills, strategies and language they need for gathering information - Ss study the sample paragraph and do exercises in the workbook.	T > Ss	To prepare Ss for the upcoming language and skills demand for gathering information stage of the project.
3	50 mins	<u>While-reading:</u> - T presents the handout providing table (printed out from the WebQuest Page) for Ss to fill in the necessary information. - T explains what information Ss need to look for. Then T tells Ss to explore the Web links. - T monitors Ss' progress to make sure they are on the right track and to help Ss gathering relevant information. T - T asks Ss to share their answers and discuss reading strategies	- Ss read the text from the Internet and find the answers to gather relevant information for the writing task. - Ss complete the answers in the handout with guided questions. - Each group shares their information to the whole class and get	T < > Ss Ss < > Ss Ss < > Ss T < > Ss Ss < > Ss	To be a lead-in to the main reading task To check reading comprehension and give feedback on and discuss reading strategies used

			feedback		
4	25 mins	Post-reading: - T prepares Ss for compiling and analyzing data. T asks Ss to group their information. T teaches how to paraphrase the copied sentences.	- Ss need to compile, and analyze the relevant information - Ss practice paraphrasing	T < > Ss Ss< > Ss	- To help Ss check the answer and relevant information before the writing task
5	90 mins	Pre-writing/ Preparation for the language demand of the final activity: - T prepares Ss for this vital stage of the project by using the writing model: T. explains that students will be writing a cause/effect composition - T discusses the cause/effect essay with the class using the guidelines from the rubrics given. - T revises the language focus (cause & effect) - T reminds the writing process (Planning, drafting, editing or revising the text) - T monitors group work and gives assistance to Ss while they are doing their writing task.	- - Ss study about writing conventions and practice writing their assignment according to the task given. - After the discussion, Ss brainstorm among their group and decide for the essay plan based on the information gathered in the earlier stage. - After Ss finish the first draft, they revise and edit their assignment using the checklist provided.	T > Ss Ss < > Ss T < > Ss Ss< > Ss	To prepares Ss for writing conventions and strategies necessary for this vital stage of the writing task To give assistance as Ss need.
6	30	Evaluation of the project: - T provides Ss with feedback on their language and content learning and lets Ss asks questions.		T < > Ss	To assess Ss whether they have reached the lesson objectives

Appendix C
Test Specifications

Reading and Writing Test

The test is developed by the researcher based on the course objectives. It is used as the pre- and post-tests in this study. The pre-test is administered to assess students' reading and writing proficiency before the experiment. After finishing the implementation of the WebQuest modules, the same test, used as the post-test, will be administered once again. The results from the pre-test and post-test will then be compared to assess the differences in their reading and writing abilities to determine if the implementation of WebQuests result in any improvement in students' reading and writing ability.

1. Reading Test

Purpose: The purpose of this reading test is to measure the ability to read and understand reading passages in technical field. Examinees read passages concerning definitions, classification, instructions, cause/effect and process description. Because students in all engineering majors have to take this course, the selected passages are not specific in any one field of study; and this can avoid creating an advantage for any major in particular.

Test Construct: The construct of the test will be specified based on the Douglas framework (2000) and the course objectives. According to the course objectives, students' reading ability required can be concluded to be the objectives of the test which are to measure:

1. Ability to recognize the meaning of basic technical terms and non-technical vocabulary used in engineering
2. Ability to comprehend the reading text in the following areas:
   2.5 Ability to skim the texts for main ideas
   2.6 Ability to scan the texts for specific information

2.7 Ability to make inferences from the information in the text

2.8 Ability to guess word meanings from context

In my research study, there are two parts of the reading test including vocabulary and reading comprehension. The reading passages will be based on the topics of the WebQuests modules including describing cause and effect, definitions and classification, instructions and process.

Part 1: Vocabulary which is considered as fundamental concepts for all engineering students will be selected

Part 2: Reading comprehension (including main idea items, specific details items, inference items, and fact items) The reading passages will be taken from printed materials and from the Internet. The length of the passages is approximately 250-350 words.

Test Type: The test type of this test is multiple choices. The reading section consists of three passages with five to seven multiple-choice questions per passage. The questions assess the comprehension of main ideas, inferences, factual information stated in the passage, references, and vocabulary.

2. Writing test

Purpose: The purpose of the writing section is to measure the ability to write in English, including the ability to generate, organize, and develop ideas, to support those ideas with examples or evidence.

Test Construct: The construct of the test will be specified based on the Douglas framework (2000) and the course objectives. According to the course objectives, students' writing ability required can be concluded to be the objectives of the test which are to measure the ability to write in English according to the topic given. This includes the ability to generate and organize ideas, to support those ideas with examples or evidence, and to compose in a well-organized writing essay about one page long.

The first part of the writing test consists of 10 items of error detecting test requiring students to select an error out of the four underlined parts of a sentence. In the second part, the topic of direct writing test will be based on familiar issues that the students have gained some information when studying with WebQuest modules. The students will be asked to write passages according to the assigned topics.

Scoring: There are five criteria in the rating scales: content, organization, vocabulary, grammar, and mechanics. The mentioned analytic scoring rubrics will be used because these scales are well supported by content and construct validity, they have been field-tested, and they are designed specifically for classroom use rather than for large scale assessment. Three raters will be asked to rate the students' writing.

Time Allocation for Reading and Writing Test: 100 Minutes

Appendix D
Reading and Writing Test

PART 1: VOCABULARY TEST (10 marks)

Direction: Choose the best answer by putting a cross (X) in the answer sheet provided

1. Glass is _____. It breaks easily when hitting with a hammer.
   a) soft b) tough
   c) brittle d) fusible
2. Plastic is a bad _____of electricity because electric current cannot flow through it.
   a) radiator b) conductor
   c) insulator d) protector
3. The rear-view mirror is designed to help the driver to see what is _____ the car.
   a) near b) behind
   c) around d) on the right of
4. This liquid is _____. Do not spray near fire.
   a) sensitive b) irritant
   c) erosive d) flammable
5. Waste paper, _____ old magazines and old telephone directories, can be recycled or remade into new paper products.
   a) occurring b) containing
   c) including d) taking place
6. Salt is soluble. It can be _____ in water.
   a) dissolved b) removed
   c) measured d) reused
7. One way to solve the problem of insufficient energy resources is to find _____ sources of energy.
   a) alternative b) selective
   c) informative d) purposive

8. A piece of iron was left in rain for a long time. As a result, it became _____
   a) rare b) impure
   c) rusty d) domestic
9. An electric motor is a machine that _____ electrical energy into mechanical energy.
   a) attaches b) converts
   c) performs d) replaces
10. Before you plug in your vacuum cleaner, make sure that the voltage indicated on the plate is _____ your local supply.
   a) close to b) known as
   c) different from d) the same as

PART 2: READING TEST (20 marks)

Direction: Read passages 1-3 and choose the correct answer by putting a cross (X) in the answer sheet provided.

Passage 1: (Questions 11-17)

The process we are going to introduce you today is a glass bottle manufacturing process. The purpose of this process is to produce ordinary container glass. Before a bottle can be produced, the raw materials must be melted and homogenized. Ordinary container glass consists of silicon dioxide (silica), sodium carbonate (soda), and calcium carbonate (lime). Its proportion is measured electronically by a computer. The components are mixed with recycled glass, or **cullet**, with a proportion of 90% of the total weight. This mixture is called a batch. Then a batch is fed into the furnace temperature of which is about 1,600 ºC. At the furnace, the batch is melted and becomes molten glass. The hot molten glass is then formed into bottles by connecting the necks and the bodies which have been formed separately. The next step is to anneal the bottles to make them less brittle. After this stage, the annealed bottles are coated with polyethylene to protect their surfaces from being scratched.

Before being packed, the bottles are inspected many times to find defects. The first step of the inspecting process starts with checking the bottles by bare eyes

to find any faults in the glass. The bottles are then mechanically checked as they are passed through a special inspecting machine. Being passed through another machine, the bottles are checked again whether their mouths are smooth and even or not. The quality of the glass is also rechecked mechanically for the second time. Finally, it is inspected again by bare eyes. We need many steps during inspection because quality control is a great concern. At each inspection stage, bottles with defects are sorted out. After the final inspection, **the approved bottles** are packed and ready for delivery.

11. What is this passage mainly about?
    a) How glass bottles are inspected.
    b) How glass bottles are packed.
    c) How glass bottles are delivered
    d) How glass bottles are manufactured.
12. According to the passage, which is **not** the step of glass bottle inspection?
    a. checking the produced glass bottles by bare eyes
    b. checking and rechecking any faults in the glass by machines
    c. checking and rechecking the quality of the glass by machines
    d. final checking the quality of the glass by special computers
13. After all the raw materials are mixed together with the right proportion, _____.
    a. the mixture is melted in the furnace
    b. the hot molten glass is formed into bottles
    c. the bottles are coated with polyethylene
    d. the glass bottles are then sorted out.
14. What is the purpose of using polyethylene to coat the bottles?
    a. For making the bottles less brittle
    b. For checking the quality of the bottles
    c. For protecting the surface of the glass bottles
    d. For checking if the mouths are smooth and even

15. The bottles are ……. many times to ensure the good quality.

a. protected b) inspected

c) sorted out d) annealed

16. What does "**the approved bottles**" (line 24) refer to?

a. the bottles with defects at the final inspection stage

b. the bottles without defects after the final inspection

c. the bottles that are passed through a special inspecting machine

d. the bottles which are mechanically checked for the second time

17. What is the **cullet** (line 7)**?**

a. raw materials b) mixed components

c) recycled glass d) ordinary container glass

Passage 2: (Questions 18-24)

Nuclear reactions can be classified as fusion and fission reactions. Those reactions in which neutrons are absorbed by a nucleus, which then becomes unstable, are called fission reactions. Fission reactions produce smaller nuclei. Fission reactions can be divided into two groups according to whether they are controlled or uncontrolled. Those in nuclear rectors occurred by absorbing the extra neutrons that would cause too many nuclei to split. These reactions provide the heat necessary to produce steam. The steam is then used to drive turbine-generators that generate electricity. If a fission reaction is uncontrolled, however, it will cause rapid production of heat and high temperatures. This is what happens in the atomic bomb. Those reactions in which hydrogen nuclei are joined to form helium are called fusion reactions. Scientists believe **these reactions** take place in the sun, which generates heat and light so important for life on earth, and try to experiment with a fusion reactor. Unfortunately, a thermonuclear reactor that can control the power output and time interval is not yet a reality. Whereas many uncontrolled fusion reactions have occurred on earth as hydrogen bombs, scientists have not been to produce controlled fusion reactions on earth.

18. What is the passage mainly about?
    a) Nuclear reactions
    b) Fission reactions
    c) Fusion reactions
    d) Thermonuclear reactions
19. Which of the following sentence is the definition of "fission reactions"?
    a) Those reactions in which neutrons are absorbed by a nucleus, which then becomes unstable, are called fission reactions.
    b) Fission reactions can be divided into two groups according to whether they are controlled or uncontrolled.
    c) Those in nuclear rectors occur by absorbing the extra neutrons that would cause too many nuclei to split.
    d) If a fission reaction is uncontrolled, however, it will cause rapid production of heat and high temperatures.
20. What does "**these reactions**"(line 12) refer to?
    a) Nuclear reactions
    b) Fission reactions
    c) Fusion reactions
    d) Thermonuclear reactions
21. Fusion reactions can be defined as ……
    a) those reactions which happens in the atomic bomb.
    b) nuclear reactions in that hydrogen nuclei are joined to form helium.
    c) the reactions that control the power output and time interval.
    d) uncontrolled reactions which generates the heat and light on earth.
22. According to the passage, controlled fission reactions are useful because scientists …….
    a) use them to experiment with a fusion power reactor.
    b) use them to generate the heat and light for life on earth.
    c) produce heat and high temperatures for making the atomic bomb.
    d) produce steam for driving turbine generators to generate electricity.
23. Until now, scientists are still not successful in …….
    a) making smaller nuclei for the atomic bomb.
    b) absorbing the extra neutrons for nuclei to split.
    c) utilizing steam for driving turbine-generators.
    d) producing controlled fusion reactions for use on earth.

24. It can be inferred from the passage that scientists ……

a) believe that controlled fusion reactions cannot be produced
b) already know how to produce controlled fusion reactions on earth.
c) still look for ways to produce controlled fusion reactions on earth.
d) will stop making use of controlled fusion reactions on earth.

Passage 3: (Questions 25-30)

Every year there are changes in climate in different parts of the world. Some of these changes are due to natural causes. However, some climatic changes are caused by air pollution and these changes may increase.

If the pollution affects the level of carbon dioxide in the atmosphere, the results are likely to be serious. Carbon dioxide constitutes only a small part of the atmosphere. But **it** has an important function in maintaining the balance between radiation from the sun entering the atmosphere and radiation leaving the Earth. Some of the radiation is absorbed by the Earth and some is radiated back into the atmosphere. The carbon dioxide in the atmosphere prevents some of the radiation from leaving the atmosphere. Thus the heat remains in the atmosphere and carbon dioxide helps to prevent the temperature of the Earth from falling.

If the proportion of carbon dioxide in the atmosphere is increased as a result of air pollution, the temperature of the atmosphere may rise. This might eventually cause the ice in the north and the south poles to melt. If **this** happened, the sea level would rise and parts of the Earth would be flooded. The likelihood of this happening is remote, but the possibility exists.

There is also a fairly strong possibility that the dust level in the atmosphere will rise as a result of industrial pollution. This dust pollution will reflect sunlight back into space. If this happens, less sunlight will reach the Earth and the temperature will fall.

Another danger comes from the destruction of the Earth's vegetation, such as the forests of Brazil, which are being cleared to make way for farmland and cities. Trees use carbon dioxide and their destruction may upset the balance of carbon dioxide in the atmosphere.

25. What is the passage mainly about?
    a) Natural causes
    b) Climatic changes
    c) Forest destruction
    d) Level of carbon dioxide
26. What does "**it**" (line 6) refer to?
    a. carbon dioxide
    b) the pollution
    c) the atmosphere
    d) the radiation of the sun
27. If **this** happened, the sea level would rise and parts of the Earth would be flooded. What does "**this**" refer to?
    a. the ice in the north and the south poles melt
    b. the amount of carbon dioxide in the atmosphere is increased
    c. the temperature of the atmosphere rises because of air pollution
    d. the proportion of carbon dioxide prevents the temperature of the Earth from falling.
28. It is possible that the increased level of dust in the atmosphere is due to……...
    a) dust pollution
    b) industrial pollution
    c) less sunlight
    d) temperature in the atmosphere
29. If _____, less sunlight will reach the Earth and the temperature will fall.
    a) the Earth's vegetation is destroyed
    b) the Earth absorbs the heat radiation
    c) the ice in the north and south poles melt
    d) the dust pollution reflects sunlight back into space
30. The balance of carbon dioxide in the atmosphere can be upset because of …….....
    a) forest destruction
    b) the level of dust pollution
    c) the growth of forests
    d) dangerous farmlands and cities

PART 3: WRITING TEST (1): (10 marks)

Direction: Choose the choice that is the error of the sentence.

31. A voltmeter is define as an electrical device which is used for measuring the voltage of an electric current.
(a) (b) (c) (d)

32. Steel can be categorized into three group depending on its carbon content.
(a) (b) (c) (d)

33. This racing bicycle is more powerful than that ordinary one but it is more cheaper.
(a) (b) (c) (d)

34. Most people thinks that computers are the most important invention of the twentieth century.
(a) (b) (c) (d)

35. Since the metal plate does not reflect sunlight, it absorbs heat better.
(a) (b) (c) (d)

36. The purpose of the solar water heating system is to provide hot and warm Water for household use.
(a) (b) (c) (d)

37. Cast iron, wrought iron, and mild steel are example of ferrous metals used in industry.
(a) (b) (c) (d)

38. In conclusion, the effects of alcoholism can causes many problems that affect your life in all aspects.
(a) (b) (c) (d)

39. First, water is collect from the river and pumped to the reservoir.
(a) (b) (c) (d)

40. Before being delivered to the customers, the powder milk are checked twice to ensure the best quality.
(a) (b) (c) (d)

PART 4: WRITING TEST (2): (20 marks)

Direction: Write a comparison/contrast passage.

It can be seen that due to modern technology, transportation never stops improving its quality and innovative inventions. Many types of transports might be invented to serve the global trade, or to help solve environmental problems. Write a paragraph of 10 to 12 sentences **comparing and contrasting transportation nowadays and transportation in the future (in the next fifty years).** You can use your imagination based on the factual information at present.

**********End of the test!**********

Appendix E

Analytic Scoring Criteria

Raters: Three trained teachers of English

Rating scale: A four-point scale (1, 2, 3, 4) are used. Criteria for four labels are as follows:

Content

4 points: main ideas stated clearly and accurately

3 points: main ideas stated fairly clearly and accurately

2 points: main ideas somewhat unclear or inaccurate

1 point: main ideas not clear or accurate

Organization

4 points: well organized and perfectly coherent (sentences logically combined)

3 points: fairly well organized and generally coherent (sentences fairly logically combined)

2 points: loosely organized, incomplete sequencing (sentences poorly combined)

1 point: ideas disconnected, lacks logical sequencing

Vocabulary

4 points: very effective choice of words

3 points: effective choice of words

2 points: fairly good vocabulary

1 point: limited range of vocabulary

Grammar

4 points: almost no errors of grammatical patterns (1-2 errors)

3 points: few errors (3-4 errors)

2 points: some errors (5-6 errors)

1 point: many errors (more than 6 errors)

Mechanics (Capital letters, spelling, and punctuation)

4 points: almost no errors of spelling and punctuation (1-3 errors)

3 points: few errors of spelling and punctuation (4-6 errors)

2 points: fair number of spelling and punctuation errors (7-9 errors)

1 point: frequent errors in spelling and punctuation (more than 9 errors)

(Adapted from Cohen, 1994: 328-329)

Appendix F

Self-rating Engagement Questionnaire (English version)

Self-rating Engagement Questionnaire
The enhancement of Students' Learning Engagement through the implementation of the WebQuest Modules Developed for Improving English Reading and Writing Abilities of Undergraduate Engineering Students at RMUTP North Bangkok

Directions

1. This self-rating engagement questionnaire is designed to investigate the level of students' learning engagement before and after the implementation of the WebQuest modules developed for improving English reading and writing abilities

2. Please give your responses to all of the following items and rate all items which best match your behaviors and feelings Your responses will be only used to evaluate and improve the quality of the WebQuest modules developed for teaching Technical English course. There will be no effects on you or the grade you will get from this subject.

3. This questionnaire is divided into two parts as follow:

Part1: Students' demographic information

Part2: Students' self-rating behaviors and feelings on students' learning engagement in three aspects:

(2.1) Behavioral Engagement

(2.2) Affective Engagement

(2.3) Cognitive Engagement

<u>Part 1:</u> Students' demographic information

Directions: The first part of this attitude questionnaire consists of four items. Please tick in the box which matches the fact about you

1. Gender ○ male ○ female

2. English grade obtained from the latest semester
○ A ○ B+ ○ B ○ C + ○ C ○ D+ ○ D

3. Computer knowledge and skills
○ Excellent ○ Good ○ Moderate ○ Poor ○ Very poor

Part2: Students' self-rating behaviors and feelings on students' learning engagement in three aspects:

2.1 Behavioral engagement

Directions: 1. Please read the statements on the left hand side and tick √ in a box to indicate the degree of your agreement to each of the statements. Please tick in only one box for each item.

Items	All of the Time	Some of the Time	Seldom	Never
	4	3	2	1
1. I come to class.				
2) I come to class on time.				
3) I ask the teacher questions.				
4) I ask my classmates questions.				
5) I answer questions that the teacher asks.				
6) I answer questions that my classmates ask.				
7) I listen actively to the teacher				
8) I listen actively to my classmates				
9) I offer my opinions and ideas.				
10) I prepare the information needed for the group.				
11) I make comments.				
12) I ask questions.				
13) I respond to things someone else says				
14) I clarify things someone else says				
15) I present the group task to the class.				

2.2 Affective engagement

Directions: Please read the statements on the left hand side and tick √ in a box to indicate the degree of your agreement to each of the statements. Please tick in only one box for each item.

No.	Items	Strongly agree	Agree	Have no idea	Disagree	Totally disagree
		5	4	3	2	1
1	I like being in class.					
2	I feel happy in class.					
3	I have fun in class.					
4	My classroom is a safe and supportive place to be.					
5	My teacher is friendly.					
6	My teacher is supportive and helpful.					
7	My teacher always gives useful advice and feedback.					
8	My teacher knows the subject matter well.					
9	My group members are friendly.					
10	My group members are collaborative.					
11	My group members are helpful.					
12	I like working with classmates on group tasks.					
13	I feel excited by the task.					
14	I am interested in the task.					
15	I enjoy participating in group activities in class.					
16	I like gathering information from the Internet to do the WebQeust tasks.					
17	I like class activity that provides rubrics for self evaluation.					
18	I want to learn more about the topic.					
19	I enjoy applying what I've learned in class to other real world problems.					
20	I find problem-solving tasks helpful.					

2.3 Cognitive engagement

Directions: Please read the statements on the left hand side and tick √ in a box to indicate the degree of your agreement to each of the statements. Please tick in only one box for each item.

Dimension	Items	5	4	3	2	1
Surface strategy	**Memorization** 1. I memorized the content of the lesson.					
	2. I memorized the language focus of the unit.					
	3 I remembered what I read from the Internet while gathering information.					
	Practicing 4. I did grammar exercises before class.					
	5. I studied at home even when I didn't have a test.					
Deep strategy	**Understanding the texts** 6. I underlined major points in the readings.					
	7. I used a dictionary to look up the proper meaning of words.					
	8. When I don't know a word, I guess from context.					
	Organizing and Summarizing what is learned 9. When I read, I ask myself questions to make sure I understand what it is about.					
	10. I summarized major points and information in my readings or notes.					
	Connecting new knowledge with past learning 11. I did additional readings on topics that were introduced and discussed in class.					
	12. I read extra materials to learn more about things that I've learned in class.					
	13. I referred to a book or resource about style of writing, grammar, etc.					
Reliance	**Relying on classmates** 14. I asked my friends what I wanted to learn more.					
	15. I asked my friends the things I didn't understand.					
	Relying on teacher 16. I asked the teacher what I wanted to learn more.					
	17.I asked the teacher the things I didn't understand.					

Appendix G

Self-Rating Engagement Questionnaire (Thai Version)

แบบสอบถามเพื่อการวิจัย

เรื่อง การพัฒนาบทเรียนเว็บเควสเพื่อพัฒนาความสามารถในการอ่านและการเขียนภาษาอังกฤษและการมีส่วนร่วมในชั้นเรียนของนักศึกษาคณะวิศวกรรมศาสตร์ มหาวิทยาลัยเทคโนโลยีราชมงคลพระนคร

คำชี้แจง

1. แบบสอบถามฉบับบนี้มีวัตถุประสงค์เพื่อศึกษาระดับการมีส่วนร่วมในชั้นเรียนด้านพฤติกรรม ด้านความสนใจ และด้านกระบวนการของความคิด ในวิชาภาษาอังกฤษ
2. แบบสอบถามฉบับนี้ ประกอบด้วย
   ตอนที่ 1 ข้อมูลพื้นฐานของผู้ตอบแบบสอบถาม
   ตอนที่ 2 แบบสอบถามเกี่ยวกับการมีส่วนร่วมในชั้นเรียนภาษาอังกฤษ
   2.1 การมีส่วนร่วมในกิจกรรมการเรียนด้านพฤติกรรม
   2.2 การมีส่วนร่วมในกิจกรรมการเรียนด้านความสนใจ
   2.3 การมีส่วนร่วมในกิจกรรมการเรียนด้านกลวิธีการเรียนและกระบวนการทางความคิด
3. โปรดตอบคำถามทุกข้อตามความเป็นจริง คำตอบของนักศึกษาจะใช้เพื่อการวิจัยเท่านั้นและจะไม่มีผลต่อคะแนนใดๆ ที่นักศึกษาจะได้รับจากการเรียน

ตอนที่ 1 ข้อมูลพื้นฐานของผู้ตอบแบบสอบถาม

คำชี้แจง โปรดทำเครื่องหมาย √ ลงใน ○ ตามความเป็นจริง

1. เพศ ○ ชาย ○ หญิง
2. ผลการเรียนวิชาภาษาอังกฤษในภาคเรียนที่แล้ว

○ A ○ B+ ○ B ○ C + ○ C ○ D+ ○D

3. ความรู้และทักษะด้านคอมพิวเตอร์

○ ดีมาก ○ ดี ○ ปานกลาง ○ น้อย ○ น้อยมาก

ตอนที่ 2 แบบสอบถามเกี่ยวกับการมีส่วนร่วมในชั้นเรียน

2.1การมีส่วนร่วมในกิจกรรมการเรียนด้านพฤติกรรมการเรียนของนักศึกษา

คำชี้แจง ขอให้นักศึกษาโปรดอ่านข้อความต่อไปนี้ แล้วแสดงความคิดเห็นว่านักศึกษามีส่วนร่วมในการเรียน มากน้อยเพียงใดโดยทำเครื่องหมาย √ ลงในช่องที่ตรงกับระดับความถี่ของพฤติกรรมการเรียนของนักศึกษา

การมีส่วนร่วมในกิจกรรมการเรียนด้านพฤติกรรม		เป็นประจำ/สม่ำเสมอ	เป็นบางครั้ง	น้อยครั้ง	ไม่เคยเลย
		4	3	2	1
การเข้าชั้นเรียน					
1	ผมเข้าเรียน				
2	ผมมาเข้าชั้นเรียนตรงเวลา				
การมีส่วนร่วมในกิจกรรมรวมทั้งชั้นเรียน					
3	ผมถามคำถามอาจารย์ผู้สอน				
4	ผมถามคำถามเพื่อนๆในห้อง				
5	ผมตอบคำถามที่อาจารย์ถาม				
6	ผมตอบคำถามที่เพื่อนๆ ถาม				
7	ผมตั้งใจฟังสิ่งที่อาจารย์พูดในระหว่างการเรียนการสอน				
8	ผมตั้งใจฟังสิ่งที่เพื่อนพูด/ตอบในระหว่างการเรียนการสอน				
การมีส่วนร่วมในกิจกรรมกลุ่ม					
9	ผมร่วมเสนอความคิดเห็น				
10	ผมช่วยเตรียมข้อมูลที่จำเป็นสำหรับงานกลุ่ม				
11	ผมช่วยวิจารณ์งานที่เราทำ				
12	ผมตั้งคำถามถามเพื่อนในกลุ่ม				
13	ผมคิดตามในสิ่งที่เพื่อนเสนอความเห็น				
14	ผมขยายความในสิ่งที่เพื่อนพูด/เสนอความคิดเห็น				
15	ผมเป็นคนนำเสนอผลงานของกลุ่ม				

2.2การมีส่วนร่วมในกิจกรรมการเรียน (ด้านความสนใจ

คำชี้แจง ขอให้นักศึกษาโปรดอ่านข้อความต่อไปนี้ แล้วแสดงความคิดเห็นหรือความรู้สึกของนักศึกษาว่านักศึกษาเห็น ด้วยกับข้อความมากน้อยเพียงใดโดยทำเครื่องหมาย √ ลงในช่องที่ตรงกับความคิดเห็นหรือความรู้สึกของนักศึกษามากที่สุดเพียงช่องเดียว

การมีส่วนร่วมในกิจกรรมการเรียนด้านเจตคติ		เห็นด้วยอย่าง ยิ่ง	เห็นด้วยมาก	ไม่มีความเห็น	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง
ข้อที่	**รายการ**	**5**	**4**	**3**	**2**	**1**
1	ผมชอบเข้าเรียนวิชาภาษาอังกฤษ					
2	ผมมีความสุขเมื่ออยู่ในชั้นเรียน					
3	ผมรู้สึกสนุกกับการเรียนในชั้นเรียน					
4	ผมรู้สึกว่าห้องเรียนภาษาอังกฤษเป็นที่ที่ปลอดภัยและช่วยส่งเสริมการเรียนรู้					
5	อาจารย์ผู้สอนมีความเป็นกันเองกับนักศึกษา					
6	อาจารย์ผู้สอนให้ความรู้และความช่วยเหลือในการเรียนนักศึกษาเป็นอย่างดี					
7	อาจารย์ผู้สอนให้คำแนะนำและข้อมูลที่เป็นประโยชน์ต่อนักศึกษาอย่างสม่ำเสมอ					
8	อาจารย์ผู้สอนเป็นผู้ที่มีความรู้ในหัวข้อที่สอนเป็นอย่างดี					
9	เพื่อนในกลุ่มของผมมีความเป็นกันเอง					
10	เพื่อนในกลุ่มของผมร่วมมือกันทำงานเป็นอย่างดี					
11	เพื่อนในกลุ่มของผมให้ความช่วยเหลือกันเป็นอย่างดี					
12	ผมชอบกิจกรรมการเรียนที่แป็นงานกลุ่ม					
13	ผมรู้สึกว่างานกลุ่ม(ที่ได้รับมอบหมายให้ทำ)น่าสนใจ					
14	ผมรู้สึกสนใจในงานที่ได้รับมอบหมาย					
15	ผมชอบทำงานกลุ่มกับเพื่อนๆ ในชั้นเรียน					
16	ผมชอบค้นหาข้อมูลการเรียนจากอินเตอร์เนต					
17	ผมชอบกิจกรรมการเรียนที่มีแบบประมินเพื่อให้นักศึกษาประมินงานของตนเอง					
18	ผมชอบศึกษาค้นคว้าเพิ่มเติมในหัวข้อที่ได้เรียนไปแล้ว					
19	ผมชอบที่จะนำความรู้ที่ได้จากการเรียนในชั้นเรียนไปประยุกต์ใช้กับปัญหาที่เกิดขึ้นจริงในโลกปัจจุบัน					
20	ผมคิดว่ากิจกรรมการเรียนแบบแก้ปัญหาเป็นสิ่งที่มีประโยชน์					

2.3การมีส่วนร่วมในกิจกรรมการเรียนด้านกระบวนการทางความคิด

คำชี้แจง ขอให้นักศึกษาโปรดอ่านข้อความต่อไปนี้ แล้วแสดงความคิดเห็นว่านักศึกษามีส่วนร่วมในการเรียน มากน้อยเพียงใดโดยทำเครื่องหมาย √ ลงในช่องที่ตรงกับระดับความถี่ของพฤติกรรมการเรียนของนักศึกษา

การมีส่วนร่วมในกิจกรรมการเรียน ด้านกระบวนการทางความคิด	ตลอดเวลา	เป็นส่วนมาก	เป็นบางครั้ง	น้อยครั้ง	ไม่เคยเลย
รายการ	**5**	**4**	**3**	**2**	**1**
1. ผมพยายามจำเนื้อเรื่องหรือเนื้อหาที่เรียน					
2. ผมพยายามจำกฎการใช้ภาษาที่สำคัญ					
3. ผมจำสิ่งที่ผมอ่านจากอินเตอร์เนตได้					
4. ผมฝึกทำแบบฝึกหัดไวยากรณ์ภาษาอังกฤษ ล่วงหน้า ก่อนที่จะมีเรียน					
5. เมื่ออยู่บ้าน ผมอ่านทบทวนสิ่งที่เรียนแล้วแม้ว่าจะไม่ใช่ช่วงเวลาสอบ					
6. ในขณะที่อ่านภาษาอังกฤษ ผมใช้วิธีขีดเส้นใต้คำหรือประเด็นที่ผมคิดว่าสำคัญ					
7. เมื่อพบคำศัพท์ยากในขณะที่อ่านภาษาอังกฤษ ผมเปิดพจนานุกรมเพื่อหาความหมายของคำศัพท์นั้น					
8. เมื่อพบคำศัพท์ยากในขณะที่อ่านภาษาอังกฤษ ผมพยายามเดาความหมายของศัพท์นั้นจากข้อความข้างเคียง					
9. ในขณะที่อ่านภาษาอังกฤษ ผมมักจะตั้งคำถามถามตัวเองเกี่ยวกับประด็นที่ผมกำลังอ่าน					
10. เมื่ออ่านภาษาอังกฤษ ผมมักจะเขียนสรุปข้อมูลหรือประด็นที่สำคัญลงในหนังสือหรือสมุด					
11. ผมพยามเชื่อมโยงสิ่งทีกำลังอ่านกับความรู้เดิมหรือเรื่องราวที่เคยรู้					
12. ผมมักจะหาหนังสืออ่านหรือค้นข้อมูลเพิ่มเติมในเรื่องที่เรียนแล้ว					
13. ผมพยายามจะอิงตำราหรือแหล่งข้อมูล เกี่ยวกับสไตล์การเขียน หรือไวยากรณ์ที่ถูกต้อง					
14. ผมมักจะถามเพื่อนในสิ่งที่ผมอยากเรียนรู้หรือศึกษาเพิ่มเติม					
15. ผมมักจะถามเพื่อนในสิ่งที่ผมไม่เข้าใจ					
16. ผมมักจะถามอาจารย์ผู้สอนในสิ่งที่ผมอยากเรียนรู้หรือศึกษาเพิ่มเติม					
17. ผมมักจะถามอาจารย์ผู้สอนในสิ่งที่ผมไม่เข้าใจ					

<u>ความคิดเห็นเพิ่มเติม:</u>

.....

ขอขอบคุณนักศึกษาทุกคนที่ให้ความร่วมมือเป็นอย่างดี

Appendix H

Student's log

Please answer the following questions after studying with each WebQuest module. You can also give other comments, suggestions or ask any questions. You can respond in THAI.

Part 1: The usefulness of the WQ modules

1.1 What do you think are the usefulness of learning through this WQ module?

……

……

……

1.2 What is the best part of this WQ module? Why?

……

……

……

1.3 What did you learn from the lesson? Did you improve your reading and writing skills when doing the activity in this lesson? How helpful was the lesson?

……

……

……

Part 2: The level of difficulty of the WQ modules

2.1 What are problems or difficulties did you come across when you were engaged in studying with this WQ module?

……

……

……

2.2 What did you do to overcome them?

……

……

……

Part 3: Students' preferences of the WQ modules

3.1 Do you enjoy studying this module? Which aspects did you enjoy? Why?

……

……

……

3.2 Are there things about this WQ module that you do not like? Why?

……

……

……

Comments, suggestions, or questions:

……

……

……

……

……

……

Appendix I

Teacher's Diary

Module …… Date……..……. ……

1. Students' behaviors in the pre-reading stage

……
……

2. Students' behaviors in the reading stage

……
……

3. Students' behaviors in the post-reading/pre-writing stage

……
……

4. Students' behaviors in the post-writing stage

……
……

5. What seemed to be working well

……
……

6. What seemed to be a problem or needed a revision

……
……

7. Learning strategies I have seen or known my students used

……
……

8. General impression of students' behaviors in class

……
……
……

Appendix J

Semi-structured Interview Protocol

Part 1: The usefulness of the WQ modules

1. 1 What do you think are the advantages of learning through the WQ modules?

……

……

1.2 How did you benefit from the WQ modules?

……

……

1.3 Please suggest ways to improve the quality and effectiveness of the instruction.

……

……

Part 2: The level of difficulty of the WQ modules

2.1 What are problems or difficulties did you come across when you were engaged in studying with the WQ modules?

……

……

2.2 What did you do to overcome those difficulties or problems?

……

……

Part 3: Students' preferences of the WQ modules

3.1 Which modules do you like most? Please state your reasons.

……

……

3.2 Which one do you enjoy the least? Please state your reasons.

……

……

Part 4: Students' cognitive engagement

Ask students to reflect on their learning strategies used during the learning process:

4.1 Memorization

……
……
……

4.2 Practicing

……
……
……

4.3 Understanding the text

……
……
……

4.4 Organizing and summarizing what is learned

……
……
……

4.5 Connecting new knowledge to what already known

……
……
……

4.6 Reliance

……
……
……

Appendix K

Research Instrument Evaluation Form (For the WebQuest Modules)

Directions: Please indicate how you respond to (appropriate, not sure or not appropriate) each of these questions by ticking (√) in the box to indicate what you think and give your comments or suggestions for the improvement of the modules

Items	Appropriate (+1)	Not sure (0)	Not Appropriate (-1)	Comments or suggestions
1. Has the Introduction part been appropriately designed?				
2. Has the task part been appropriately and interestingly designed?				
3. Has the process part been appropriately and clearly designed?				
4. Have the rubrics in evaluation part been appropriately and clearly designed?				
5. Have the modules been appropriately designed for the enhancement of English reading and writing?				

Additional comments or suggestions

_____
_____
_____
_____

Appendix L

Research Instrument Evaluation Form (For the Lesson Plans)

Directions: Please indicate how you evaluate (appropriate, not sure, or not appropriate) each of these statements by ticking (√) in the box to indicate what you think and give your comments or suggestions for the improvement of the lesson plans.

Items	Appropriate (+1)	Not sure (0)	Not Appropriate (-1)	Comments or suggestions
1. The objectives of the lesson plans are appropriate.				
2. The procedures in the lesson plan are consistent with the model.				
3. The materials and tasks used in the lesson plans are appropriate.				
4. The teaching procedures in the lesson plans are appropriate for the enhancement of English reading and writing skill.				
5. The language used in the lesson plans is clear.				

Additional comments or suggestions

_____
_____
_____
_____
_____
_____

Appendix M

Research Instrument Evaluation Form (For Reading and Writing Test)

Directions: Please indicate how you evaluate (appropriate, not sure or not appropriate) each of these statements by ticking (√) in the box to indicate what you think and give your comments or suggestions for the improvement of the reading and writing achievement test.

Part 1: Reading Test:

Items	Appropriate (+1)	Not sure (0)	Not appropriate (-1)	Comments or suggestions
1. The test is consistent with its objectives.				
2. The test reflects content validity.				
3. The result of the test can reflect students' reading comprehension ability according to the test objectives.				
4. The quantity of the test is appropriate.				
5. The language used in the test is precise and clear.				
6. The time given is appropriate.				

Additional comments or suggestions

……

……

……

Part 2: Writing Test:

Items	Appropriate (+1)	Not sure (0)	Not appropriate (-1)	Comments or suggestions
1. The test is consistent with its objectives.				
2. The test reflects content validity.				
3. The result of the test can reflect students' writing achievement according to the test objectives.				
4. The writing scoring criteria are clear and appropriate for the test of writing achievement.				
5. The length of the test is appropriate.				
6. The language used in the test is precise and clear.				
7. The time given is appropriate.				

Additional comments or suggestions

……

……

……

……

……

……

Appendix N

Evaluation Form for the Self-rating Engagement Questionnaire

Directions: The evaluation form for the questionnaire consists of two parts.
Part 1: The evaluation of the overall aspect of the questionnaire
Part 2: The evaluation of each individual question in the questionnaire

Please evaluate each of these statements by ticking (√) in the box to indicate your opinions (appropriate, not sure, or not appropriate) and also give your comments or suggestions for the improvement of the questionnaire

Part 1: The evaluation of the overall aspect of the self-rating engagement questionnaire

Items	Appropriate (+1)	Not sure (0)	Not appropriate (-1)	Comments or suggestions
1. Consistency of the lesson plan to the objectives of the lesson unit				
2. Appropriateness of the activities in each teaching stage				
3. Appropriateness of the use of teaching materials in each teaching stage				
4. Appropriateness of teaching procedure to develop students' reading skill				
5. Appropriateness of teaching procedure to develop students' writing skill				
6. Clarity of the language used in this lesson plan				

Additional comments or suggestions

……
……

Part 2: The evaluation of each individual question in the questionnaire

2.1 Behavioral engagement

Items	Appropriate (+1)	Not sure (0)	Not appropriate (1)	Comments or suggestions
1. I come to class.				
2) I come to class on time.				
3) I ask the teacher questions.				
4) I ask my classmates questions.				
5) I answer questions that the teacher ask				
6) I answer questions that my classmates ask.				
7) I listen actively to the teacher				
8) I listen actively to my classmates				
9) I offer my opinions and ideas.				
10) I prepare the information needed for the group.				
11) I make comments.				
12) I ask questions.				
13) I respond to things someone else says				
14) I clarify things someone else says				
15) I present the group task to the class.				

2.2 Affective engagement

No.	Items	Appropriate (1)	Not sure (0)	Not appropriate (-1)	Comments & suggestions
1	I like being in class.				
2	I feel happy in class.				
3	I have fun in class.				
4	My classroom is a safe and supportive place to be.				
5	My teacher is friendly.				
6	My teacher is supportive and helpful.				
7	My teacher always gives useful advice and feedback.				
8	My teacher knows the subject matter well.				
9	My group members are friendly.				
10	My group members are collaborative.				
11	My group members are helpful.				
12	I like working with classmates on group tasks.				
13	I feel excited by the task.				
14	I am interested in the task.				
15	I enjoy participating in group activities in class.				
16	I like gathering information from the Internet to do the WebQeust tasks.				
17	I like class activity that provides rubrics for self evaluation.				
18	I want to learn more about the topic.				
19	I enjoy applying what I've learned in class to other real world problems.				
20	I find problem-solving tasks helpful.				

2.3 Cognitive engagement

Dimension	Items	Appropriate (+1)	Not sure (0)	Not appropriate (-1)	Comments & suggestions
Surface strategy	**Memorization** 1. I memorized the content of the lesson.				
	2. I memorized the language focus of the unit.				
	3 I remembered what I read from the Internet while gathering information.				
	Practicing 4. I did grammar exercises before class.				
	5. I studied at home even when I didn't have a test.				
Deep strategy	**Understanding the texts** 6. I underlined major points in the readings.				
	7. I used a dictionary to look up the proper meaning of words.				
	8. When I don't know a word, I guess from context.				
	Organizing and Summarizing what is learned 9. When I read, I ask myself questions to make sure I understand what it is about.				
	10. I summarized major points and information in my readings or notes.				
	Connecting new knowledge with past learning 11. I did additional readings on topics that were introduced and discussed in class.				
	12. I read extra materials to learn more about things that I've learned in class.				
	13. I referred to a book or resource about style of writing, grammar, etc.				
Reliance	**Relying on classmates** 14. I asked my friends what I wanted to learn more.				
	15. I asked my friends the things I didn't understand.				
	Relying on teacher 16. I asked the teacher what I wanted to learn more.				
	17.I asked the teacher the things I didn't understand.				

Additional Comments & suggestions:

……

……

……

……

……

……

Appendix O

Research Instrument Evaluation Form (For Student's Log)

Please indicate how you evaluate (appropriate, not sure or not appropriate) each of these questions by ticking (√) in the box to indicate what you think and give your additional comments or suggestions for the improvement of the logs**.**

Questions	Appropriate (+1)	Not sure (0)	Not appropriate (-1)	Comments or suggestions
Part 1: The usefulness of the WQ modules 1.1 What do you think are the usefulness of learning through this WQ modules?				
1.3 What is the best part of this WQ module? Why?				
1.4 What did you learn from the lesson? Did you improve your reading and writing skills when doing the activity in this lesson? How helpful was the lesson?				
Part 2: The level of difficulty of the WQ modules 2.2 What are problems or difficulties did you come across when you were engaged in studying with this WQ module?				
2.3 What did you do to overcome them?				
Part 3: Students' preferences of the WQ modules 3.3 Do you enjoy studying this module? Which aspects did you enjoy? Why?				
3.4 Are there things about this WQ module that you do not like? Why?				

Additional comments and suggestions

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Appendix P

Research instrument Evaluation Form (For Teacher's Diary)

Please indicate how you evaluate (appropriate, not sure or not appropriate) each of these points by ticking (√) in the box to indicate what you think and give your additional comments or suggestions for the improvement of the instrument**.**

Items	Appropriate (+1)	Not sure (0)	Not appropriate (-1)	**Comments or suggestions**
1.Students' behaviors in the pre-reading stage of the teaching module				
2. Students' behaviors in the reading stage of the teaching module				
3. Students' behaviors in the post-reading/ pre-writing stage of the teaching module				
4. Students' behaviors in the post-writing stage of the teaching module				
5. What seemed to be working well				
6. What seemed to be a problem or needed a revision				
7. Learning strategies I have seen or known my students used				
8. General impression of students' behaviors in class				

Additional comments and suggestions

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Appendix Q

Research Instrument Evaluation Form
(For Semi-structured interview protocol)

Please indicate how you evaluate (appropriate, not sure or not appropriate) each of these questions by ticking (√) in the box to indicate what you think and give your additional comments or suggestions for the improvement of the logs

Questions	Appropriate (+1)	Not sure (0)	Not appropriate (-1)	Comments or suggestions
Part 1: The usefulness of the WQ modules 1.1 What do you think are the usefulness of learning through this WQ modules?				
1.2 What is the best part of this WQ module? Why?				
1.3 What did you learn from the lesson? Did you improve your reading and writing skills when doing the activity in this lesson? How helpful was the lesson?				
Part 2: The level of difficulty of the WQ modules 2.1 What are problems or difficulties did you come across when you were engaged in studying with this WQ module?				
2.2 What did you do to overcome them?				
Part 3: Students' preferences of the WQ modules 3.1 Do you enjoy studying this module? Which aspects did you enjoy? Why?				
3.2 Are there things about this WQ module that you do not like? Why?				

Part 4: Students' cognitive engagement 4.1 Memorization				
4.2 Practicing				
4.3 Understanding the text				
4.4 Organizing and summarizing what is learned				
4.5 Connecting new knowledge to what already known				
4.6 Reliance				

Other comments and suggestions:

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BIOGRAPHY

Mrs. Pornpilai Termsinsawadi received her B.A. in French from Silpakorn University in 1975 and M.A. in Applied Linguistics (English for Science and Technology) from King Mongkut's University of Technology Thonburi in 1981. She is presently an English instructor at the faculty of Liberal Arts, Rajamangala University of Technology Phra Nakhon.