ผลของการพูดแบบหลากหลายโดยวิธีการสื่อสารผ่านคอมพิวเตอร์และการทำโครงงาน
ต่อสมิทธิภาพทางการพูดภาษาอังกฤษและกลวิธีการสื่อสารของนิสิตระดับปริญญาตรี

นางสุมณี ปิ่นเวหาส์

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรดุษฎีบัณฑิต
สาขาวิชาภาษาอังกฤษเป็นภาษานานาชาติ (สหสาขาวิชา)
บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2553

THE EFFECTS OF DIFFERENTIATED SPEAKING INSTRUCTION USING COMPUTER-MEDIATED COMMUNICATION AND PROJECT WORK ON THAI UNDERGRADUATE STUDENTS' ENGLISH SPEAKING PROFICIENCY AND COMMUNICATION STRATEGIES

Mrs. Sumanee Pinweha

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
Chulalongkorn University
Academic Year 2010

Thesis Title	THE EFFECTS OF DIFFERENTIATED SPEAKING INSTRUCTION USING COMPUTER-MEDIATED COMMUNICATION AND PROJECT WORK ON THAI UNDERGRADUATE STUDENTS' ENGLISH SPEAKING PROFICIENCY AND COMMUNICATION STRATEGIES
By	Mrs. Sumanee Pinweha
Field of Study	English as an International Language
Thesis Advisor	Assistant Professor Apasara Chinwonno, 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

..... Chairman
(Associate Professor Supanee Chinnawongs, Ph.D.)

..... Thesis Advisor
(Assistant Professor Apasara Chinwonno, Ph.D.)

.....Examiner
(Associate Professor Punchalee Wasanasomsithi, Ph.D.)

.....Examiner
(Assistant Professor Jintavee Khlaisang, Ed.D.)

..... External Examiner
(Assistant Professor Kittitouch Soontornwipast, Ed.D.)

สุมณี ปิ่นเวหาส์: ผลของการพูดแบบหลากหลายโดยวิธีการสื่อสารผ่านคอมพิวเตอร์และการทำโครงงานต่อสมิทธิภาพทางการพูดภาษาอังกฤษและกลวิธีการสื่อสารของนิสิตระดับปริญญาตรี. (THE EFFECTS OF DIFFERENTIATED SPEAKING INSTRUCTION USING COMPUTER-MEDIATED COMMUNICATION AND PROJECT WORK ON THAI UNDERGRADUATE STUDENTS' ENGLISH SPEAKING PROFICIENCY AND COMMUNICATION STRATEGIES) อ. ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ. ดร. อาภัสรา ชินวรรโณ, 205 หน้า.

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาผลของการสอนการพูดแบบหลากหลายโดยใช้การสื่อสารผ่านคอมพิวเตอร์และการทำโครงงานต่อสมิทธิภาพทางการพูดภาษาอังกฤษและเปรียบเทียบการรับรู้เกี่ยวกับการใช้กลวิธีการสื่อสารของนิสิตระดับปริญญาตรีก่อนและหลังการทดลอง กลุ่มตัวอย่างคือนิสิตปริญญาตรี วิชาเอกภาษาอังกฤษจำนวน 9 คน (n = 9) ในระหว่างการทดลอง 10 สัปดาห์ นิสิตต้องทำโครงงานและสื่อสารกันผ่านคอมพิวเตอร์ทั้งแบบในเวลาต่างกัน และแบบเวลาเดียวกัน การเก็บข้อมูลมีทั้งในเชิงปริมาณและคุณภาพ เพื่อศึกษาสมิทธิภาพทางการพูดและการใช้กลวิธีการสื่อสารของนักเรียน คะแนนจากการทดสอบการพูดภาษาอังกฤษก่อนและหลังการทดลองถูกนำมาหาค่าความแตกต่างของสมิทธิภาพทางการพูดโดยใช้ Wilcoxon Matched-Paired Signed Ranks Tests นอกจากนี้แบบสอบถามเกี่ยวกับการใช้กลวิธีการสื่อสารได้ถูกออกแบบขึ้นเพื่อเปรียบเทียบการใช้กลวิธีการสื่อสารก่อนและหลังการทดลอง บทถอดความคำพูดผ่านคอมพิวเตอร์ของนักเรียนถูกนำมาวิเคราะห์หากลวิธีการสื่อสารและคำตอบการสัมภาษณ์ ถูกนำมาวิเคราะห์เพื่อศึกษาถึงความคิดเห็นต่อการทดลอง

ผลจากการวิเคราะห์ข้อมูลเชิงปริมาณพบว่าคะแนนจากการทดสอบการพูดภาษาอังกฤษก่อนและหลังการทดลอง เพิ่มขึ้นอย่างมีนัยสำคัญ แต่ผลจากการเปรียบเทียบคะแนน จากแบบสอบถามการใช้กลวิธีการสื่อสาร ก่อนและหลังการทดลองไม่มีความแตกต่างอย่างมีนัยสำคัญ ผลจากการวิเคราะห์ข้อมูลเชิงคุณภาพจากบทถอดความคำพูด ผ่านคอมพิวเตอร์ พบว่านิสิตใช้ 5 กลวิธีการสื่อสารได้แก่ การทดแทน การยื้อเวลา การเน้น การเลี่ยง และการใช้ปฏิสัมพันธ์ โดยมีรูปแบบการใช้กลวิธีการเหล่านี้คือ การใช้หลายกลวิธีเพื่อเป้าหมายเดียว กลวิธีการเดียวแต่มีหลายหน้าที่ วิธีการละทิ้งข้อความและการเจรจาปฏิสัมพันธ์ ผลจากการสัมภาษณ์พบว่า การทดลอง มีบรรยากาศที่เป็นมิตรซึ่งมีส่วนกระตุ้นให้นิสิตเข้าร่วมกิจกรรม และเป็นผลให้สมิทธิภาพทางการพูดดีขึ้น

สาขาวิชา...ภาษาอังกฤษเป็นภาษานานาชาติ... ลายมือชื่อนิสิต.....สุมณี ปิ่นเวหาส์.....

ปีการศึกษา..2553..... ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก.....

5087867620: MAJOR: ENGLISH AS AN INTERNATIONAL LANGUAGE
KEYWORDS : DIFFERENTIATED INSTRUCTION/ PROJECT WORK/ COMPUTER-MEDIATED COMMUNICATION/ ENGLISH SPEAKING PROFICIENCY

SUMANEE PINWEHA: THE EFFECTS OF DIFFERENTIATED SPEAKING INSTRUCTION USING COMPUTER-MEDIATED COMMUNICATION AND PROJECT WORK ON THAI UNDERGRADUATE STUDENTS' ENGLISH SPEAKING PROFICIENCY AND COMMUNICATION STRATEGIES. THESIS ADVISOR: ASST. PROF. APASARA CHINWONNO, PH.D., 205 pp.

This study investigates the effects of the Differentiated Speaking Instruction using Computer-Mediated Communication (CMC) and Project Work (DCP) on Thai undergraduate students' English speaking proficiency. It also compares their perceived use of communication strategies before and after the intervention. The participants were 9 undergraduate students majoring in English. During the 10-week intervention, students design a multimedia project work using asynchronous (audioblogs) and synchronous (voice chats) CMC. The quantitative and qualitative data were collected and analyzed in order to investigate the effectiveness of the intervention as well as the perceived use of students' communication strategies. Students' pre-test and post-test English Speaking Proficiency test scores were compared using the Wilcoxon Matched-Paired Signed Ranks Tests. Communication Strategy Inventory was designed to compare their perceived use of communication strategies. Conversation analysis was employed to examine students' use of communication strategies via CMC. Finally, a semi-structured interview was conducted to elicit their opinions about the intervention.

The findings from the quantitative data show that students gain significantly higher scores after participating in this intervention ($p < .05$). However, there is no significant difference between their mean scores on the Communication Strategy Inventory before and after the intervention. The findings from the qualitative data reveal five major categories of CMC communication strategies. They are compensatory, time-gaining, emphasis, avoidance, and interactional strategies. Patterns of communication strategies emerging from the data are the use of multiple strategies for one target, multiple functions of one strategy, forms of message abandonment, and negotiated interaction. Students reflect in the semi-structured interview that DCP creates a positive learning environment that stimulates their participation and contributes to improvement in their English speaking ability.

Field of Study: English as an International Language Student's signature.....

Academic Year: 2010 Advisor's signature.....

ACKNOWLEDGEMENTS

I would like to express my gratitude to the 90th Anniversary of Chulalongkorn University Fund (Ratchadaphiseksomphot Endowment Fund) for providing the grant for my study.

The completion of this dissertation would not have been possible unless I had had the support of many people. I would like to express my deepest gratitude to my advisor, Asst. Prof. Dr. Apasara Chinwonno, who saw potential in me and encouraged me to work harder. In addition to the knowledge she gave me, she has taught me to believe in myself and work to my full capacity.

I also owe my gratitude to my dissertation committee. Assoc. Prof. Dr. Supanee Chinnawongs, the committee chair, who has always been supportive and generous with her time. Assoc. Prof. Dr. Punchalee Wasanasomsithi and Asst. Prof. Dr. Jintavee Khlaisang, who have been kind, understanding, and helpful. I am also grateful to Asst. Prof. Dr. Kittitouch Soontornwipast, the external committee member from Thammasat University, who has given valuable comments and suggestions for my study. I would like to express my special thanks to Professor Leo van Lier at the Monterey Institute of International Studies for sharpening my knowledge of qualitative research methodology. I would also like to thank Asst. Prof. Dr. Chuenchanok Kowin, Professor Kathleen Bailey, and Professor Jean Turner for providing feedback on my study.

I am grateful to all Ajarns from the English as an International Language Program who have equipped me with knowledge and wisdom. My gratitude also goes to all the experts who helped validate my research and instructional instruments. I would like to thank all my colleagues and friends, especially Dr. Noawanit Songkram, Dr. Ruedeerath Chusanachoti, Dr. Pachareepan M. Ratanaphon, Dr. Erik Kuhonta, Sunchai, Nittaya, Punyapa, Sasima, Pornsawan, Rawiwan, and Potcharawan for your help and moral support. I also thank all my students for reminding me whom I am doing this for. Most of all, I would like to thank my father, mother, and Aunt Wanida for taking good care of me and the kids. Thank you Kan, Manee, and Mickey for being there for me and showering me with your love.

CONTENTS

Page

Page

Page

Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER I
INTRODUCTION

1.1. Background of the study

English is considered one of the most important subjects taught at school in Thailand. It is regarded not just as a tool for communication but also a way to enable learners to increase their knowledge of the world (Promsiri, Prapphal and Vijchulata, 1996). In addition, it is believed that learners who are proficient in the English language will have better opportunities in life, education, and work. However, overall, the English proficiency of Thai undergraduate students is low, especially in listening and speaking skills, when compared to the overall proficiency of those in neighboring countries such as Malaysia, Singapore, and the Philipines (Wiriyachitra, 2002). Rivers (1981) notes that speaking is used twice as much as reading and writing outside the classroom. Unfortunately, however, speaking skills are not a focus of Thai tertiary education (Wiriyachitra, 2002). In fact, it is recognized as the weakest skill of Thai students because of interference from the mother tongue (Thai), a lack of opportunity to speak English in daily life, shyness to speak English with classmates (Biyaem, 1997), unchallenging English lessons, and passive learning (Wiriyachitra, 2002).

Such problems have been recognized and certain reforms have been implemented for English language teaching and learning in Thai higher education institutions. However, despite the existence of such reforms, studies reveal that little improvement has been made in English language teaching and learning. Most Thai EFL teachers still use the teaching methods they are familiar with such as the grammar-translation approach which focuses on grammatical structure, vocabulary and reading (Maskhao, 2002). Students are still shy to speak in class because of their poor grammar. In addition, they are viewed as passive learners and lack authentic exposure outside of the class (Khumuen, 2003).To help Thai

students survive in this increasingly competitive world, fundamental changes have to be made in the classroom to help promote students' English speaking proficiency.

1.2. Statement of problems

Differentiated instruction derives from the need for teachers to ensure that all students of different abilities will benefit from their learning. It is based on four guiding principles which focus on the fundamental concepts included in the course content, responsiveness to individual students' differences, integration of assessment and instruction, and ongoing adjustment of content, process and products to meet individual students' levels of prior knowledge and way of thinking (Rock, Gregg, Ellis, & Gable, 2008). Tomlinson (2006) proposes that the curriculum, variance among learners, classroom environment, and teaching methods should be considered when planning a differentiating lesson. It is important that teachers recognize their students' differences regarding readiness to learn, interests, and personal profiles which include learning styles, gender, culture and intelligence preference. In addition to these factors, the classroom environment is also important. Teachers should create a learning environment that makes students feel accepted and appreciated. At the same time, the curriculum should be focused, engaging and challenging. Finally, the method of teaching should be varied. Teachers should recognize learner variance and aim to develop multiple routes for teaching and learning to help students achieve their goals. In addition, Rock et al. (2008) suggest that assessment is another essential part of differentiated instruction. It should not include the traditional method of using multiple choice tests to evaluate students' learning. Instead, assessment should be an ongoing process that takes place at different stages of an instruction: before, during and after.

Computer-mediated communication (henceforth CMC) is "communication that takes place between human beings via the instrumentality of

computers" (Herring, 1996: 1). It benefits language learning in many ways. Beauvois (1997), Chun (1998) and Warschauer (1996) have found that CMC helps create a less stressful environment for second language learning. Chun (1994) and Sullivan and Pratt (1996) state that it provides more equal participation than face-to-face interaction by allowing shy and less motivated students to participate in the exchanges. Furthermore, CMC also increases output from more learner participation in the exchange (Beauvois, 1997; Kelm, 1992; Kern, 1995; Kim, 2003; Warschauer, 1996). Finally, CMC users perform syntactically more complex and morphologically more accurate language (Chun, 1994; Kelm, 1992; Kern, 1995; Warschauer, 1996). It is evident that CMC facilitates comprehensible input and output, promotes negotiation of meaning through online interaction and improves learners' linguistic features as they interact with more competent language users.

This interaction is even more beneficial if learners are engaged in a meaningful task. Project work is an instructional approach that engages learners with meaningful and authentic tasks which help promote student-centeredness, learner autonomy, collaborative learning, creative thinking and creativity. Its unique characteristic is that specific language aims are not prescribed, but all skills and content knowledge are enhanced while learners complete a final project. This approach is based on Dewey and Kilpatrick's Constructionism and Vygotsky's Social Constructivism. The heart of project work is the determination of the teacher to engage students in a 'binding communicative activity' (Barson, 1997: 4), having a final project as a stimulant for creative energy and contextualized language use and learning.

Studies show that project-oriented language learning integrated with Internet technology benefits language learners in many ways. Firstly, learners may be exposed to authentic texts, tasks and interaction (Warschauer, 1998). Secondly, it provides opportunities to develop linguistic skills that are not available in a traditional classroom (Ewing, 2000). Thirdly, it supports

intercultural and autonomous learning (Mueller-Hartman, 2000). Finally, it increases learners' levels of input and output and enhances motivation, engagement and collaborative learning skills (Gu, 2002).

With a combination of differentiated instruction, CMC, and project work, students should be more motivated to speak English. Through differentiated instruction, students' learning is closely supported and in a CMC environment incorporated with project work, students should be engaged in meaningful interactions that will help them enhance their English speaking proficiency.

According to Faerch and Kasper (1983), communication strategies help speakers to compensate for communication breakdowns, facilitate oral production of the target language, and become more confident. Communication strategy use may also be stimulated via CMC. While negotiating for meaning, the students may employ communication strategies to maintain communication flow. Smith (2003) suggests that communication strategy use in CMC should be examined because it will show how students avoid communicative disruptions and pursue successful language performance. It is also essential for language teachers to understand the 'norms of language use' during computer-mediated interactions and their contribution to second language acquisition.

However, the study of communication strategies via CMC is still under-explored and no one has studied the use and patterns of communication strategy use while participating in voice CMC (audioblogs and voice chats) in an EFL context. This study will fill this research gap and discuss the effects of Differentiated Speaking Instruction using Computer-Mediated Communication and Project-Work (henceforth DCP) on Thai students' English speaking proficiency and communication strategies.

1.3. Research questions

This study addresses the following research questions:

1. To what extent does Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work (DCP) improve Thai undergraduate students' English speaking proficiency?
2. What communication strategies do Thai undergraduate students use while participating in DCP?
3. Is there any significant difference between Thai undergraduate students' perceived use of communication strategies before and after participating in DCP?
4. What are Thai undergraduate students' opinions about DCP?

1.4. Objectives of the study

This study aims:

1. To investigate the effects of DCP on English speaking proficiency of Thai undergraduate students
2. To identify what communication strategies Thai undergraduate students use while participating in DCP
3. To investigate the difference between Thai undergraduate students' perceived use of communication strategies before and after participating in DCP
4. To explore Thai undergraduate students' opinions about DCP

1.5. Statement of hypotheses

The hypotheses of this study are as follows:

1. Thai undergraduate students' English speaking post-test mean scores will be significantly higher than their English speaking pre-test mean scores at 0.05 level after taking the DCP
2. There is a significant difference between Thai undergraduate students' perceived use of communication strategies before and after participating in DCP at 0.05 level.

1.6. Scope of the study

1. The population in this study are English-major students from the Faculty of Education in a Thai university.
2. The data were collected using the following research instruments and methods: TOEIC Speaking Test, Communication Strategy Inventory, students' audioblogs, students'voice chats, and a semi-structured interview.

1.7. Limitations of the study

This study has been designed to optimize internal and external validity. However, there were some limitations that should be considered when interpreting the findings of this study.

Sample size—Since this research was conducted in a classroom setting, the sample size was small. Therefore, generalization of the findings should be made with caution.

Research design—This study employed the pre-test/ post-test quasi experimental design because students were assigned by the registration office to their sections. It was impossible to randomly select the sample from the population.

1.8. Definition of terms

Differentiated Speaking Instruction is a teaching theory that is based on the premise that there is variability among learners (readiness level, interest and learning profile). The teachers should adjust their instructional approaches (content, process, and product) accordingly, rather than expecting students to adapt themselves to the curriculum. The TOEIC Speaking Test was utilized to examine students' readiness level (proficiency). Oral Interviews were conducted to elicit students' learning profiles. Topic of Interest Questionnaire was used to elicit students' topics of interest and the Multiple Intelligence Inventory was employed to explore students' learning styles.

Computer-Mediated Communication is communication that takes place between human beings synchronously and asynchronously. In this study, the communication is teacher to students and students to students via the CMC tools. Synchronous CMC tools used in this study were voice chats and asynchronous CMC tools were audioblogs. Students' recorded voice chats and audioblogs were analyzed to identify students' communication strategies while participating in DCP.

Project Work is an instructional approach that engages learners with meaningful and authentic tasks which enhance students' content knowledge and language skills. The process of project work in this study involved five main stages: preparation, presentation, practice, assessments, and follow-up. The project work was assessed by the instructor, peers, and students themselves based on the Project Work Assessment Rubric.

Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work is an intervention that takes into account students' readiness levels, interests and learning profiles when designing the lessons. While doing project work, students used CMC tools as a means for promoting comprehensible input and output, negotiation of meaning, collaboration and scaffolding.

English Speaking Proficiency is the ability to convey a message intelligibly using proper pronunciation and structure (linguistic and discourse competence), following sociocultural roles of language (sociocultural competence), and employing communication strategies properly to cope with communication breakdowns (strategic competence). Students' English speaking proficiency in this study was assessed by means of the TOEIC Speaking Test, including six tasks: reading aloud, describing pictures, responding to questions, responding to questions using information provided, proposing a solution, and expressing an opinion. The criteria in an analytical scoring adapted from ETS (2007) included pronunciation, intonation and stress, grammar, vocabulary, cohesion, relevance of content, and completeness of content.

Communication strategies are strategies used to overcome problems caused by students' insufficient knowledge of the target language (English). The categories of communication strategies emerging from students' audioblogs and voice chats were strategies for compensating for the unknown words, strategies for gaining more time, strategies for emphasizing, and strategies for unsuccessful execution. Students' perceived use of communication strategies was assessed by a developed 4-point Likert scale Communication Strategy Inventory adopting the framework of Cohen and Dörnyei (2002).

Thai Undergraduate students refer to English-major students from the Faculty of Education, Chulalongkorn University. Their ages ranged from 18-21. They were in their fourth year of a 5-year Teacher Preparation Program. According to the TOEIC Speaking pre-test scores, students were at the intermediate to upper-intermediate level. Their technological backgrounds varied from novice to expert. Half of them had been exposed to synchronous CMC (voice chats), but none had experienced asynchronous CMC (audioblogs).

1.9. Significance of the study

This study aims to develop a speaking intervention to enhance English speaking proficiency and communication strategies. The findings of this study are significant in several ways. Firstly, in terms of theoretical significance, the findings can contribute to the understanding of the effects of voice CMC on English speaking proficiency and can also reveal the communication strategies used via these tools.

In addition, the developed DCP can also contribute to English speaking instruction in Thailand. CMC, one of the central components of this intervention, has been reported to lower learners' anxiety and increase their input. This intervention has the potential to lessen Thai students' inhibition which hinders them from being proficient language users.

Besides contributing to instruction methods, this study also has a pedagogical purpose. It provides insight into the nature of English speaking instruction incorporating the Internet technology such as CMC. Students' reflections regarding the instruction will provide valuable information for any teachers who wish to implement DCP.

1.10. An overview of the study

This study aimed to investigate the impact of the Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work on Thai undergraduate students' English speaking proficiency and also explore their use of communication strategies. This chapter presents the background and statement of the problems. Research questions and objectives address the effects of the DCP on students' English speaking proficiency and communication strategies. The scope, variables, limitations, definition of terms, and significance of the study are also explained.

Chapter 2 reviews the literature related to differentiated instruction, project work, CMC, speaking proficiency, and communication strategies.

Chapter 3 elaborates on the research methodology. It explains the research design, population and sample, research instruments, instructional instruments, instrument validation, data collection, and analyses.

Chapter 4 reports the findings of the four research questions. Both quantitative and qualitative data are presented.

Chapter 5 presents a summary of the study, discussions of the findings, pedagogical implications, and recommendations for future research.

CHAPTER II
LITERATURE REVIEW

There are six main underlying concepts which are the foci of this study: differentiated instruction, project work, computer-mediated communication (CMC), speaking proficiency and asssessment, communication strategies, and conversation analysis. The general characteristics of each concept are discussed in this section.

2.1. Differentiated instruction

Differentiated instruction is an instructional approach that is based on the premise that there is variability among learners and that teachers should adjust their instructional approaches accordingly rather than expecting students to adapt themselves to the curriculum. The characteristics and major components of differentiated instruction are as follows:

2.1.1. Characteristics of differentiated instruction

The idea of differentiated instruction was derived from the need to help students of different intellectual abilities improve their learning in classrooms in the USA as a part of two government policies: the Individuals with Disabilities Education Act (IDEA, 2004) and No Child Left Behind (NCLB, 2001). It is a recognition of the fact that classrooms generally include students with different ability levels: high, grade level, and low. The students in the low group are the most problematic in learning as they cannot catch up with the rest of the class. Therefore, it is the teacher's job to make sure that all students achieve the preset learning goals (Rock et al., 2008).

Tomlinson (2000) states that there are seven basic beliefs underlying differentiated instruction: (1) same-age students differ markedly in their life circumstances, past experiences and readiness to learn; (2) students' differences have a significant impact on the content and pace of instruction; (3) student learning is heightened when receiving the support from the teacher that challenges them to work slightly above what they do independently; (4) student learning is enhanced when what it can be connected to their real life; (5) student learning is strengthened by authentic learning opportunities; (6) student learning is boosted when students feel that they are respected and valued; and (7) an overarching goal of schooling is to recognize and promote the abilities of each student.

Based on these beliefs, Tomlinson and Cooper (2006) propose that learner, classroom environment, curriculum (content) and teaching methods (process) are the major criteria to be considered when differentiating instruction. However, Rock et al., (2008) add other two variables to be considered. Those are the teacher variable and the assessment variable (product). According to Corley (2005) and Hall (2002), teachers should first consider learners' needs, then design their curriculum (content), teaching methods (process) and assessment (product) corresponding to their learners' variability. In this study, the teacher variable, which included documents' analyses (curriculum and course description) and the learner variable, was firstly examined. Then, the content, process, and product were designed accordingly. Even though experts suggest the classroom environment be considered when differentiating instruction, it was not considered as a major component in this study, but rather a sub-topic of the content variable.

2.1.2. Major components of differentiated instruction

The five major components of differentiated instruction: the teacher (documents' analyses), the learner, the content, the process, and the product are discussed as follows:

2.1.2.1. The teacher

In differentiated instruction, teachers should evaluate their knowledge and skills, identify resources and systems for support, then set reasonable goals and realistic timelines to introduce differentiated instruction in the class. In order to be successful in developing a differentiated instruction, the course curriculum and the course description should be carefully examined. Teachers, therefore, should have an in-depth understanding of the subject matter that they teach. In this study, the course curriculum and the course description were thoroughly examined before developing the course content.

2.1.2.2. The learner

The main focus of differentiated instruction is on the learner. It is a shift away from teacher-centered to student-centered classrooms where the one-size-fits-all approach is inapplicable.

It is important that the teacher take students' readiness, interests and learning profiles into consideration when designing an instruction. Evidence shows that students are more successful in school and are more engaged if they are taught in ways that are responsive to their readiness levels (Vygotsky, 1978), interests (Csikszentmihalyi, 1990) and learning profiles (Sternberg et.al., 1998). The definitions and characteristics of these three terms are as follows:

Readiness

Corley (2005) defines 'readiness' as students' knowledge, understanding, and skill related to a particular sequence of learning and influenced by students' cognitive proficiency, prior learning, life experience and attitudes about school. The concept of "readiness" is grounded in the work of Lev Vygotsky (1978) and the zone of proximal development (ZPD), the range at which learning takes place. Research determined that in classrooms where individuals were performing at a level of about 80% accuracy, students learned more and felt better about themselves and the subject area under study (Rock et al., 2008).

Interest

Interest is defined by Corley (2005) as topics that evoke student's curiosity and passion, and that will engage students in learning. Tomlinson and Cooper (2006) state that interest is closely related to motivation. If students are engaged in a learning activity that matches their interest, motivation will be increased, resulting in a more favorable outcome.

Learning profile

Learning profile includes learning style, intelligence preference, culture and gender. According to Howard Gardner (1993), learners learn and work in multiple ways; therefore, the teacher should not generalize patterns to all individuals within a group but should develop students' strengths by helping students compensate for weaknesses in the various intelligence areas.

The teacher can differentiate instruction according to students' readiness levels (proficiency), interests, and learning profiles by providing learning activities that offer students choices for demonstrating mastery of learning.

In this study, the content, process and product of the course were adjusted to meet the students' readiness levels, interests, and learning profiles. The details are discussed as follows.

2.1.2.3. The content

Content is what the student needs to learn such as major concepts, principles and skills. It should be important and focused, engaging, challenging, and supported. Tomlinson and Cooper (2006) state that it is essential that the teacher teaches what is most important in the disciplines and important to students. In addition, the content should also be engaging to stimulate students' curiosity and interest. One way to do this is to help them see that what they learn is of value for them in the real world. Furthermore, they need to see what they learn as challenging and supporting because challenge will bring growth to students' learning. Students also need to sense the support is ready for them once they get stuck.

In this study, the teacher differentiated the instruction by adjusting the degree of complexity using diverse instructional processes (face-to-face, online and self-study) to teach the content.

2.1.2.4. The process

Process is an activity in which students engage in order to make sense of or master the content. It is the teacher's goal to develop multiple routes for teaching and learning to provide alternatives for students to succeed. There are multiple ways to differentiate the process, for example, by using tiered activities (same task but different levels of difficulty), varying the length of time for completing the task, or allowing students to perform individual work, pair work or group work.

In this study, the teacher varied the classroom activities to fit each student's level and allowed the students to work individually, in pairs or in groups.

2.1.2.5. The product

The product or assessment demonstrates whether students have learned the key concepts and skills of a unit. Each student should create different products based on his or her own readiness levels, interests, and learning preferences by being provided with a choice of four or five products that he or she can choose to demonstrate mastery of learning.

In this study, students were able to choose what they were going to create as a final project. For example, they could create video clips by using a presentation tool or video editing tool based on their technological knowledge.

Differentiated instruction is an ideal instruction in which the teachers take account the students' variability when designing the lessons. However, its implication in a language classroom is not clear. Experts only suggest ways for differentiating instruction in general. To create environments that support differentiated instruction in a language classroom, project-based learning and CMC were integrated into this study. The details of both principles are discussed as follows:

2.2. Project Work

Project work is an instructional approach that stimulates students' motivation to learn by engaging them in meaningful tasks, texts and interaction. It has been widely defined and characterized. In this section, definitions and characteristics of project work, its integration with the Internet technologies and frameworks are elaborated upon.

2.2.1. Definitions and characteristics of project work

Project work has been widely defined and characterized by a number of experts as shown in the following quotations:

> *Projects are multi-skill activities focusing on topics or themes rather than on specific language targets. As specific language aims are not prescribed, and students concentrate their efforts and attention on reaching an agreed goal, project work provides students with opportunities to recycle knowledge, language and skills in a relatively natural context (Haines, 1989, p. 1)*

> Project work is a *"versatile vehicle for fully integrated language and content learning." (Stoller, 1997, p. 3)*

> *Project work is student-centered and driven by the need to create an end product. However, it is the route to achieving this end-product that makes project work so worthwhile. The route to the end-product brings opportunities for students to develop their confidence and independence and to work together in a real-world environment by collaborating on a task. (Fried-Booth, 2002, p.6)*

The versatility of project-based learning makes it difficult to articulate one single definition that takes into account the various ways in which the concept can be translated into practice. However, based on the quotations mentioned earlier, project work can be defined as an instructional approach that

engages learners in meaningful and authentic tasks which promote student-centeredness, learner autonomy, collaborative learning, critical thinking and creativity. Even though specific language aims are not prescribed, all skills and content knowledge are extensively enhanced while learners are completing an end product.

To successfully conduct project work, Stoller (2006) proposes ten conditions be taken into consideration: 1) it should have a process and product orientation; 2) it should be defined by students to encourage student ownership in the project; 3) it should be conducted over a period of time (rather than a single class session); 4) it should encourage the natural integration of skills; 5) it should make a dual commitment to language and content learning; 6) it should allow students to work in groups and on their own; 7) it should require students to take some responsibility for their own learning through the gathering, processing, and reporting of information from target language resources; 8) it should require teachers and students to assume new roles and responsibilities; 9) it should result in a tangible final product; and 10) it should conclude with student reflections on both the process and the product.

Since the DCP integrated CMC for this study, the aforementioned conditions proposed by Stoller (2006) are partially applicable. Studies concerning project work and the Internet technologies are explored in the next section.

2.2.2. Project work and the Internet technologies

Debski (2006) states that the development of the Internet technologies allowing people to use computer networks for social purposes, known as ‘social computing,’ has made a great contribution to project-based learning and teaching. Communication tools such as online diaries, emailing and chatting help

engage learners in creative, goal-oriented and collaborative activities. He states that the integration of project work and the Internet technology would help engage students in a 'binding communicative activity' (Barson, 1997: 4), having a project as a catalyst for creative energy and contextualized language use and learning.

Warschauer et al. (2000) support the above statement and suggest teaching guidelines for integrating the Internet technologies into a lesson as follows: 1) students should be immersed in learning language skills and technology skills simultaneously, with the teacher providing the necessary structure and support along the way, 2) the computer is used naturally and regularly together with other tools and media, "serving the creation of an enriched workplace for accessing resources and using language constructively" (Barson & Debski, 1996: 52), 3) the classroom needs to incorporate project work to support new ways of teaching and engage students in meaningful tasks, and 4) the course curriculum should be shaped according to students' own needs and interests having the teacher guiding them on the side.

Even though Warschauer et al. (2000) provide such useful suggestions, they do not provide a practical framework for integration of project work in the classroom like Debski (2006) does. In the next section, the frameworks used in this study will be elaborated upon.

2.2.3. Frameworks of project work

There are four project work frameworks synthesized in this study, namely, those of Alan and Stoller (2005), Fried-Booth (2002), Debski (2006) and Mills (2006). The first two frameworks are for a typical classroom, while the second two are for a classroom integrated with the Internet technologies. The details of each framework are as follows.

2.2.3.1. Alan and Stoller's framework

Alan and Stoller (2005) point out that the project-based learning approach has been under-exploited in some language classrooms because teachers have too much control or students are left alone without guidance on the language, content or process. In addition, evaluation tends to focus primarily on the appeal of the project and disregards student's gains in language and content learning. They then propose ten stages of implementing project work in a language classroom that would help maximize its benefits. The process includes 1) students and the teacher agree on a theme for the project, 2) students and the teacher determine the final outcomes of the project, 3) students and the teacher structure the project, 4) the teacher prepares students for the demands of information gathering, 5) students gather information, 6) the teacher prepares students to compile and analyze data, 7) students compile and analyze information, 8) the teacher prepares students for the language demands of the final activity, 9) students present the final product and 10) students evaluate the project.

2.2.3.2. Fried-Booth's framework

Fried-Booth (2002) proposes three main stages of implementing project work. The first is the planning stage in which students discuss the scope and content of their project. The objectives, language needs, and end product should be identified. As a successful project depends on how well-organized the teacher is, the teacher should prepare adequate resources and space for the project and should consider students' safety if the information gathering is to be done outside of the classroom.

In the implementation stage, students perform the task of achieving the predetermined objectives, and the teacher monitors students' performance and

gives support. To provide students with a clearer vision of what their end product should be like, examples of previous projects should be presented.

The last stage is the creation of the end product which may come in different forms such as posters, websites, magazines or audio recordings. Collaborative learning can be promoted if friends are taking part in the project. In addition, evaluation can be either formal or informal, and the teacher should provide a follow-up program to address students' language needs.

When comparing the frameworks proposed by Alan and Stoller (2005) and Fried-Booth (2002), it was found that Fried-Booth (2002) was more clear and applicable in language classrooms.

2.2.3.3. Debski's framework

Debski (2006) proposes six stages of implementing project-oriented CALL (the term he coined for project work integrated with technology) as in the following:

Incubation stage is to find out what best motivates students to learn and plan the process that will lead to the achievement of setting goals.

Awareness stage is to increase self, group, role and language awareness among students.

Investment stage will facilitate student access to communities that use the language they study.

Justification stage will educate students about the rationale behind project-oriented learning and the role of technology in teaching and learning a language.

Creation stage provides students with opportunities to complete creative writing tasks and to share information among themselves and their future audience.

Donation stage will confirm the students' relationship with the communities they have been interacting with by presenting the product of their work.

Debski (2006) comments that technology can be integrated into project-based language learning by providing platforms for discussing, building, and sharing student's projects (Resnick, 2002). Students can use electronic mail, bulletin boards and chat to exchange information about their projects. In addition, they can also use web content and multimedia on the Internet to create their end products such as a web site or blog. Finally, students can publish their work on the web and share the knowledge they gain with a worldwide online audience.

Even though this framework integrates Internet technologies, two stages, namely, the investment stage and donation stage proposed by Debski (2006), are inapplicable. This is because the projects developed by the students in this study were small-scaled. Therefore, the two stages mentioned above were not fully adopted.

2.2.3.4. Mills' framework

Mills (2006) proposes seven steps for designing web-enhanced learning projects. First, curriculum-based goals for student learning should be identified. Then, learning objectives supporting the classroom curriculum should be determined. After that, an assessment protocol should be established based on the learning objectives, process of learning and products of learning. It should identify the final product such as web page, oral presentation, or written report. Rubrics are often used to establish an objective basis for evaluating both process and product learning. Then, the learning tasks that will accomplish the learning objectives and permit students to complete the assessment process should be

identified and the Internet information resources should be specified and their use described. After that, the learning tasks are to be structured and sequenced. Finally, the learning tasks should be rehearsed to make sure that the sequence and associated information resources are applicable to learning objectives. Links to information resources should always be verified as accurate and appropriate**.**

Even though Mills' (2006) framework is applicable to this study, it does not include how the project work can be assessed like other experts' frameworks.

This study adopted all the frameworks mentioned earlier and categorized them into five main stages: preparation, presentation, practice, assessment, and follow-up. A summary of the project work frameworks is shown in Table 3.12.

2.2.4. Research in project work

Series of research have investigated the effects of project work on different aspects of language learning. The following studies showed positive effects and highlighted the benefits of project work in language classrooms.

Sudrung (2004) studied the effects of a project-based curriculum on 27 Thai high-school students' English language skills. Students'needs were analyzed prior to the course. Students followed the project work process in order to create five assigned projects. The findings from pre-tests and post-tests' scores showed improvement of all four language skills, namely, listening, speaking, reading, and writing.

Toyoda (2000) reported similar findings from the study of learners of Japanese. His study aimed to investigate the effects of project-oriented computer-assisted language learning (CALL) on 12 international students' information technology skills and Japanese language proficiency. His findings from class observation, interviews, and web-based project assessment revealed positive effects of an integration of project work and technology. He found that students

with different areas of expertise help each other. Their communication with the teacher and peers increased. However, there were minor technological problems concerning the email sending task.

Besides the language skills, project work has also been reported to promote authenticity, critical thinking, team learning, and negotiation of meaning. Andrews (2000) examined students in two French classes (one class with six students and the other with eight students). Through class observation, weekly teacher's log, students' document gathered from web forum, web pages, e-mails, and student interview, findings showed that students in the class implementing project work were exposed to more authentic materials and were facilitated to make more critical reflection via online peer assessment. Tragoolsrid (2002) supported the benefits of project work and reported the positive effects on team learning. 30 Thai undergraduate students were divided into five groups. The findings from the Team Learning Questionnaires and Team Performance Questionnaires showed students' improvement of team learning skills. One of the most interesting study integrating project work and CALL was by Jeon-Ellis, Debski, & Wiggleworth's (2005) which investigated eight students' oral interactions while completing project work in the PrOCALL (project-based computer-assisted language learning) classroom. The findings from video and audio recording of the class talk, interviews, questionnaires, participant observation, and students' web pages showed that the PrOCALL context can provide students with opportunities for negotiation of meaning or collaborative dialogues—dialogues in which speakers are engaged problem-solving and knowledge-building about language.

It is apparent that project work is a powerful teaching approach with unique characteristics and process that may promote students' improvement on language proficiency, and other aspects of language learning such as

authenticity, critical thinking, team learning, and negotiation of meaning or collaborative dialogues.

Besides the project work, CMC was another principle adopted in this study. Its qualities such as lowering pressure and increasing students' output (Kelm,1992; Kern, 1995; Kim, 2003) are valuable for maximizing students' learning. CMC will be discussed in the next section.

2.3. Computer-mediated communication (CMC)

CMC has been widely defined by many experts; however, the most cited is by Herring (1996) who defines CMC as "communication that take place between human beings via the instrumentality of computers" (p. 1).

As this study aimed to use CMC to enhance students' speaking proficiency, it is essential to understand how CMC can lead students to such ability. Second language acquisition theories will be discussed and then the types and uses of CMC will be elaborated upon.

2.3.1. Computer-mediated communication and speaking proficiency

Over the past two decades, the benefits of CMC in language learning have been extensively reported. The advancement of CMC technology in the mid 1990s has allowed its remote users to orally communicate with one another via voice CMC such as voice chat, voice e-mail, and audio conferencing (Rosell-Aguilar, 2005). These tools have been reported to contribute significantly to EFL classrooms. Voice CMC increases the students' speaking practice time because it allows teachers to assign more pair work activities than in a face-to-face classroom (Hampel & Hauck, 2004). In a large class in which the students have a limited number of speaking turns, CMC can be "an effective tool in providing

more time for speaking practice" (Cheon, 2003, p. 10). It was also reported to increase students' speaking proficiency (Satar & Ozderner, 2008; Volle, 2005).

Second language acquisition (SLA) theories that explain the processes of language acquisition in the CMC environment are Krashen's Input Hypothesis, Swain's Output Hypothesis, Long's Interaction Hypothesis and the Sociocultural approach to SLA.

2.3.1.1. Krashen's Input Hypothesis

Krashen (1985) suggests that a language learner will learn best when he or she is provided with comprehensible input--linguistic structures that are a little beyond the learner's current level of competence (i+1). What is relevant to the CMC learning environment in Krashen's input hypothesis is that students in CMC produce more input than in face-to-face conversation (Beauvois,1992; Kelm, 1992; Kern, 1995; Kim, 2003; Perez, 2003; Warschauer, 1996); therefore, CMC is an environment where students get exposed to a large amount of comprehensible input.

2.3.1.2. Swain's Output Hypothesis

Krashen's input hypothesis is supported by Swain (1985) who proposes that one also needs opportunities to produce comprehensible output when acquiring a language. Swain's Output Hypothesis (1985) was formulated based on the results of her study which show that even though her learners of French had been extensively exposed to the target language, they failed to achieve native like proficiency. In her opinion, output plays an important role in language acquisition. Learners need opportunities to use their linguistic resources in a meaningful and contextualized way. Based on this, CMC is an ideal place for learners to practice the target language with their peers in a relatively stress-free

environment. Students' affective filter will be lower because their anonymity can be maintained (Kelm, 1996) and their anxiety when making mistakes can be mitigated (Beauvois, 1997; Chun, 1998; Warschauer, 1996). Besides Krashen's comprehensible input and Swain's comprehensible output, Long's Interactional Hypothesis also concerns second language acquisition via CMC.

2.3.1.3. Long's Interaction Hypothesis

According to Long (1996), it is within interaction that one acquires a language. It is modifying input and modifying interaction that makes input more comprehensible and it is the input from this negotiated interaction that has a great impact on language learning. Negotiation of meaning is an attempt of interlocutors to "resolve communication breakdown and to work toward mutual comprehension" (Pica, Holliday, Lewis, & Morgenthaler, 1989: 65). Through negotiation of meaning, interaction is changed and redirected, leading to greater comprehensibility. In a CMC environment, students participate in genuine, contextualized communication. Many studies have reported that meaningful interaction and negotiation of meaning increased in a CMC environment when compared to face-to-face one (Fernandez-Garcia & Martinez-Arbelaiz, 2002; Smith, 2003; Pellettieri, 2000).

2.3.1.4. Sociocultural Approach

According to Vygotsky (1978), social interaction plays a salient role in learning and development. He points out that learners possess two levels of development. One is an actual development level (what one can do) and a potential developmental level (what one should be able to do in the future). The learner progresses from the actual level to the potential level through interactions with peers. The area between the actual and potential levels is called the learner's

Zone of Proximal Development (ZPD). It is the interaction with others that helps learners move through their ZPD to reach a potential developmental level and it is during the interaction that language learning occurs. A CMC learning context can provide learners with more opportunities to interact with others and to be scaffolded by someone who is more proficient through socialization and collaboration.

In this study, CMC was used as a medium of communication between the teacher and students and students and students. The synchronous CMC tool used in this study was voice chat and the asynchronous CMC tool was an audioblog. The tasks designed aimed to promote comprehensible input, comprehensible output, negotiation of meaning, collaboration and scaffolding. In the next section, types and uses of CMC tools are discussed.

2.3.2. Types and uses of CMC

Interactions via CMC can be categorized into two modes: asynchronous and synchronous. Their characteristics and uses are as follows:

2.3.2.1. Synchronous tools

Synchronous tools enable real-time communication and collaboration in a ‘same time-different place’ mode. These tools allow people to connect at a single point in time, at the same time. The primary drawback of synchronous tools is that, by definition, they require same-time participation. Different time zones and conflicting schedules can create communication challenges. In addition, they tend to be costly and may require significant bandwidth to be efficient (Ashley, 2003).

The synchronous tool used in this study was voice chat. It is a synchronous CMC tool that allows a user with a computer to call and speak to

others using a computer or landline telephone. Voice chat is like using a regular phone except that it uses the Internet for the call. It is inexpensive or often even free. In addition, it prepares the user to work with communication lacking visual clues like speaking via a telephone. The user can download the software, select a username and a password. Once the software is downloaded to the computer, the user can invite people to their contact lists and make a connection. In this study, the voice chat was used to stimulate students' interaction with an information-gap activity (describing pictures) to promote students' negotiation of meaning.

2.3.2.2. Asynchronous tools

Asynchronous tools enable communication and collaboration over a period of time through a "different time-different place" mode. These tools allow people to connect at each person's own convenience and own schedule. Asynchronous tools are useful for sustaining dialogue and collaboration over a period of time and providing people with resources and information that are instantly accessible, day or night. They possess the advantage of being able to involve people from multiple time zones. In addition, asynchronous tools are helpful in capturing the history of the interactions of a group, allowing for collective knowledge to be more easily shared and distributed.

In this study, the asynchronous tool used was an audioblog. It is an asynchronous tool that combines blogs (web logs) and audio files. Users could post audio files online, instead of or in addition to text files, and share these files with an audience. The entries were catalogued by date and time and were stored as an audio portfolio. Audioblogs are an excellent place for students to post their opinions and ideas.

In this study, audioblogs were used as a channel for students to express their opinions and reflections, and practice speech production.

2.4. Speaking proficiency

2.4.1. Definition and characteristics of speaking proficiency

Murphy (1991) states that speaking proficiency is a subcategory of oral communication skills involving listening and pronunciation. Bailey (2006) comments that speaking skill is more difficult than receptive skills such as reading and writing because speaking happens in “real time” and is almost always accomplished via interaction with at least one other speaker.

Bailey (ibid.) examines the components of spoken English by presenting the following model proposed by van Lier (1995) which is useful for helping teachers to fully understand the substantial components related to speaking skill.

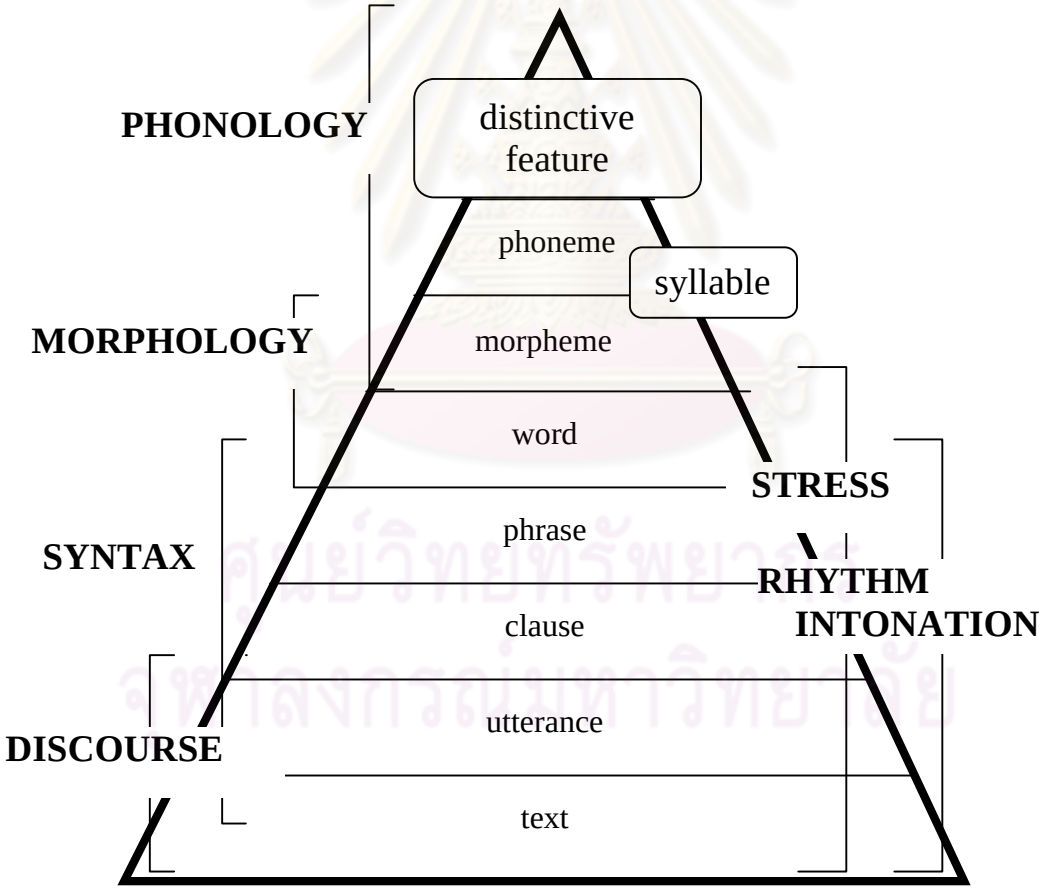


Figure 2.1 Units of Language (van Lier, 1995, p.15)

The figure shows the many elements involved in speaking. The left column represents four traditional linguistic components, namely phonology, morphology, syntax, and discourse. The center column illustrates the units of spoken language. At the base of the pyramid, text refers to stretches of language. Spoken texts are composed of utterances - what someone says. A clause refers to two or more words that contain a verb marked for tense and a grammatical subject. A phrase is two or more words that function as a unit but do not have a subject or a verb marked for tense. A word is called a free morpheme when it can stand alone and convey meaning. In contrast, bound morphemes are to be connected to other words. A phoneme is a unit of sound that distinguishes meaning. It can be either a consonant or vowel sound. A syllable overlaps the levels of morphemes and phonemes because a syllable can consist of a morpheme or simply one or more phonemes. Consonants and vowels are called segmental phonemes. Their distinctive feature is a minute contrast of two sounds such as /p/ and /b/ that are separated by voicing. The three labels on the right of the pyramid—stress, rhythm and intonation—represent the suprasegmental phonemes. When we speak, these phonemes carry meaning differences above the segmental phonemes depending on where the stress is placed.

2.4.2. Process of speech production

In order to understand how the linguistic elements mentioned above work, the process of speech production by Levelt (1989) are outlined here. The four processes are conceptualization, formulation, articulation and self-monitoring. *Conceptualization* is to plan the message content. *Formulation* is to find words to express meaning (lexicon), sequence them in an appropriate grammatical order (syntax) and prepare speech patterns of words to be used (phonology). *Articulation* is to execute the speech concerning motor control of

the articulatory organs. Finally, *self-monitoring* is the ability of language users to identify and self-correct mistakes.

Bygates (2001) states that it is difficult for elementary learners to speak fluently and accurately because they lack both automation of the four processes and accuracy. Speaking is reciprocal and less predictable than written interactions. It is produced “on-line,” so that speakers have no chance to check or correct it. This time pressure affects the three first processes, namely, conceptualization, formulation and articulation.

To evaluate how well students deal with these production processes, experts suggest some guidelines and options as explained below.

2.4.3. Assessing Speaking Skill

In order to assess speaking skill effectively, several considerations are to be taken into account. O’Malley and Pierce (1996) suggest that the activities to be assessed should come from activities taught in class and should be appropriate for the students’ level of oral language proficiency. Furthermore, assessment should focus on both communicative and academic language functions and to be conducted regularly. Finally, the results of assessments should be provided to students to help them make the necessary changes in their performance.

The three ways of assessing speaking that are commonly used are direct test, indirect test and semi-direct test. A direct test requires students to speak the target language as in an oral interview, conversation or unscripted role-play. In an indirect test, test takers do not actually speak but may be given a conversation cloze test or phoneme discrimination task. Finally, in the semi-direct test, students speak but do not interact as in a conversation or role-play. They may listen to prompts and provide a response.

As speaking is a productive skill, its scoring methods are more complex than receptive skills such as reading and listening. The three main methods for scoring speaking skill are objective scoring, holistic scoring, and analytical scoring. Objective scoring is a method that does not involve judgment. Holistic scoring involves judgment and training raters. A speech sample such as an oral interview, recorded conversation or passage read aloud is given an overall evaluation which can be a rating (six on a ten-point scale) or a designation (pass or not pass) or advanced designation (novice, intermediate, advanced or superior categories). Analytical scoring involves abilities underlying the speaking skills such as vocabulary, grammar, pronunciation and fluency based on theory (Bailey, 2005).

In this current study, students took the TOEIC Speaking Test—a semi-direct test in which they were required to answer prompts. Students were rated by two raters using analytical scoring. Criteria based on the ETS (2007) included pronunciation, intonation and stress, grammar, vocabulary, cohesion, relevance of content, and completeness of content.

2.5. Communication Strategies

2.5.1. Definitions of communication strategies

A communication strategy is “a mutual attempt of two interlocutors to agree on a meaning in situations where requisite meaning structures do not seem to be shared” (Tarone, 1980: 419). The term was coined by Selinker (1972) in his seminar paper on “interlanguage,” discussing “strategies of second language communication” (p. 229). However, he did not go into detail about the nature of these strategies. Around the same time, Savignon (1972) published a research report in which she highlighted the importance of *coping strategies* (the term she used for communication strategies) in communicative language teaching and

testing. Then in 1973, Váradi gave a talk at a small European conference on systematic analysis of strategic language behavior. However, Váradi's paper was not published until 1980. By that time, Tarone and her associates (Tarone, 1977; Tarone, Cohen, & Dumas, 1983) had published two studies specifically focusing on communication strategies, providing the first definition of "communication strategy" and introducing a taxonomy that is considered to be the most influential at present.

Interest in communication strategies increased greatly after Canale and Swain (1980) included them in their model of communicative competence as components of strategic competence. They define the term as "the verbal or nonverbal communication strategies that may be called into action to compensate for breakdowns in communication due to performance variable or due to insufficient competence" (p. 200). It is the competence underlying one's ability to make repairs, to cope with imperfect knowledge, and to sustain communication through "paraphrase, circumlocution, repetition, hesitation, avoidance and guessing as well as shifts in register and style" (Savignon, 1983, p. 40-41). These definitions correspond to Tarone (1980)'s statement that "communication strategies are seen as tools used in a joint *negotiation of meaning*, in situations where both interlocutors are attempting to agree as to communicative goal" (p. 420).

2.5.2. Frameworks of communication strategies

The frameworks of communication strategies vary according to the researchers' different perspectives regarding the issue. The three major perspectives are the traditional approach, the interactional approach, and the psychological approach.

2.5.2.1. Traditional approach

In the traditional approach, communication strategies are viewed as verbal or nonverbal first-aid devices used to compensate for gaps in the speaker's L2 proficiency. This view is reflected in Tarone's (1977) and Faerch and Kasper's (1983) definitions:

> *Conscious communication strategies are used by an individual to overcome the crisis which occurs when language structures are inadequate to convey the individual's thought. (Tarone, 1977: 195)*

> *CSs are potentially conscious plans for solving what to an individual presents itself as a problem in reaching a particular communicative goal. (Faerch & Kasper, 1983: 36)*

According to this conceptualization, communication strategies constitute a subtype of L2 problem-management efforts, dealing with language production problems that occur at the planning stage. They are separate from the other types of problem-solving devices, meaning-negotiation and repair mechanisms (e.g. requesting and providing clarification), which involve the handling of problems that have already surfaced during the course of communication.

2.5.2.2. Interactional approach

Proponents of the interactional approach see communication strategies from a different perspective. They define them as "tools used in a joint negotiation of meaning where both interlocutors are attempting to agree as to a communicative goal" (Tarone, 1980: 420). This interactional perspective would

allow for the inclusion of various repair mechanisms, which Tarone considered communication strategies if their intention was “to clarify intended meaning rather than simply correct linguistic form” (1980: 424).

2.5.2.3. Psychological (cognitive) approach

While the researchers of the interactional approach see communication strategies as a communicative device to compensate the breakdown in an interaction, proponents of the psychological approach (Bialystok, 1990) see communication strategies from yet another perspective. They argue that communication strategies are inherently mental procedures; therefore, communication strategy research should investigate the cognitive processes underlying strategic language use. They claim that not understanding the cognitive psychological and psycholinguistic dimensions of communication strategy use, and focusing only on the surface verbalizations of underlying psychological processes, would lead to taxonomies of doubtful validity.

Instead of conducting product-oriented research, Bialystok recommends that communication strategy research adopt a new analytic perspective, focusing on the cognitive “deep structure” of strategic language behavior.

2.5.3. The classification of communication strategies

A large number of studies on communication strategies have proposed different types of strategies. However, the most up-to-date and comprehensive one is by Cohen & Dörnyei (2002) who have classified communication strategies into four major categories: 1) avoidance or reduction strategies, 2) achievement or compensatory strategies, 3) stalling or time-gaining strategies, and 4) interactional strategies. Details are as follows:

2.5.3.1. Avoidance or reduction strategies

Message abandonment is a strategy in which a speaker leaves a message unfinished because of some language difficulty.

Topic avoidance is a strategy in which a speaker avoids topic areas or concepts which pose language difficulties.

Message replacement is a strategy in which a speaker substitutes the original message with a new one because of not feeling capable of executing it.

2.5.3.2. Achievement or compensatory strategies

Circumlocution is a strategy in which a speaker describes or exemplifies the target word he or she cannot remember (for example, 'the thing you open bottles with' for *corkscrew*).

Approximation is a strategy in which a speaker uses an alternative term which expresses the meaning of the word as closely as possible to the one he or she cannot remember (for example, ship for 'sail boat').

Use of all-purpose words is a strategy in which a speaker extends a general, 'empty' lexical item to contexts where specific words are lacking (for example, the overuse of thing, stuff, make, and do).

Use of non-linguistic means is a strategy in which a speaker uses mime, gesture, facial expression and sound imitation to convey the meaning.

Literal translation is a strategy in which a speaker translates literally a lexical item, an idiom, a compound word or structure from the native language toward the target language.

Foreignizing is a strategy in which a speaker uses a word in the native language by adjusting it towards the target language phonologically and/or morphologically.

Code switching is a strategy in which a speaker switches to using the native language.

2.5.3.3. Stalling or time-gaining strategies

Use of fillers and other hesitation devices is a strategy in which a speaker uses filler words or gambits to fill pauses and to gain time to think (for example, well, now let me see, as a matter of fact, etc.)

Repetition is a strategy in which a speaker repeats a word or a string of words immediately after they were said (either by the speaker or the conversation partner).

2.5.3.4. Interactional strategies

Appeal for help is a strategy in which a speaker turns to his or her conversation partner for help when facing a language deficit either directly (for example, 'What do you call…?) or indirectly (e.g., rising intonation, pauses, eye contact, or puzzled expression).

Asking for repetition is a strategy in which a speaker requests repetition when not hearing or understanding something properly (e.g. 'Sorry?,' 'Pardon?').

Asking for clarification is a strategy in which a speaker requests confirmation of what he or she heard or whether he or she understood something correctly (e.g. 'You mean…?,' 'Do you mean…?').

Expressing non-understanding is a strategy in which a speaker expresses the fact that he or she did not understand something properly either verbally or nonverbally (e.g. 'Sorry, I don't understand', 'I think I've lost the thread').

Interpretive summary is a strategy in which a speaker paraphrases the interlocutor's message to check if the speaker has understood correctly (e.g. 'So what you are saying is…,' 'Let me get this right; you are saying that…..').

2.5.4. Computer-mediated communication and communication strategies

Studies on communication strategies via CMC have thus far mainly relied on the interactional viewpoint. They reported on the participants' communication strategies while negotiating for meaning— efforts of two people engaged in an interaction trying to maintain the flow of communication. This negotiation of meaning contributes to second language learning (Bialystok,1990; Dörnyei, 1995; Kasper & Kellerman, 1997). In the CMC environment, students are facilitated in the negotiation of meaning with one another which leads to extensive use of communication strategies.

Chun (1994) did a pioneering study that addressed communication strategy use during CMC. She reported a wide array of individual styles of interaction with students' electronic discourse resembling that of oral discussion. She found that computer mediated interaction fostered interactional moves such as clarification requests, confirmation and comprehension checks, and repair. Smith (2003) supported Chun's findings and reported similar results showing that learners used a wide range of communication strategies during CMC similar to those found in face-to-face interaction. In addition, he also found that non-linguistic and para-linguistic cues such as eye gaze, nods, intonation, and pitch used in spoken discourse to communicate meaning were absent in the text-based CMC exchanges. Khamis (2010) did a similar investigation of students' communication strategies via text-based CMC in the EFL context. She found that the majority of 15 Egyptian students used topic continuation strategies (using prompts to continue the discussion) most frequently, both in asynchronous and synchronous text-based CMC. Off-task discussion (replacing a previous message with an unrelated topic), forward inferencing (showing understanding), and hypothesis testing were respectively less preferable.

Even though these studies have provided information about communication strategies in CMC, the use of communication strategies via asynchronous and synchronous voice CMC has never been investigated, especially in the EFL context. To fill this research gap and to further study communication strategies existing in natural online talks, this study will explore communication strategies used by Thai students in asynchronous and synchronous CMC while participating in the Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work.

In order to explore students' communication strategy use via CMC tools, conversation analysis was employed. In the next section, conversation analysis is introduced and the transcription conventions are elaborated upon.

2.6. Conversation Analysis (CA)

Conversation analysis is a method of describing people's social interaction. It is based on four basic assumptions: talk is action, action is structurally organized, talk creates and maintains intersubjective reality, and understanding is publicly displayed.

Talk is action

In converstion analysis, talk is considered a vehicle of human action. The language conveys ideas of speakers' actions, e.g. opening and closing conversation, and telling stories.

Action is structurally organized

In the CA view, actions are structured and organized. Speakers comply with rules and structures in order to convey a comprehensible message.

Talk creates and maintains intersubjective reality

Conversation analysis gives access to the construction of meaning in real time. In CA studies, talk and interaction are examined to identify the speakers' intentions.

Understanding is publicly displayed

CA focuses on meanings and understandings that are made public through conversational action. Speakers' mutual understanding can be reached when both parties understand the message conveyed in the previous turn. In producing a turn of talk that is hearable as an answer, the speaker also shows that he or she understood the preceding turn as a question. Based on this assumption, Silverman (2006) suggests that analyzing a single turn of talk should be avoided. It is essential to understand how the positioning of a particular utterance relates to how the speakers make sense of what is going on.

CA studies concern three features of talks: turn-taking and repair, conversational openings and 'adjacency pairs,' and 'institutional' talk.

Turn-taking and repair

Turn-taking and repair include (1) how a speaker makes a turn relate to the previous turn, (2) what the turn interactionally accommplishes, and (3) how the turn relates to a succeding turn. When turn-taking errors and violations occur, 'repair mechanisms' will be used. Silverman (2006) states there are consequences of turn-taking and repair and that a speaker and his or her conversational partners must listen to all utterances in a conversation. In addition, both parties should share the same system in which utterances are understood. For example, both parties should understand that 'How are you?' is used as a greeting. Lastly, when a speaker offers an 'appropriate' form of reply,

his or her interlocutor (someone who responds) is expected to show understanding. This turn-taking system is the means that both parties use to display to one another that they are engaged in social interaction.

Conversational openings and adjacency pair

In the 1960s, Schegloff applied conversation analysis to his study of patterns of telephone answering. He determined from studying the first 5 seconds of 500 telephone calls to and from an American police station the basic rules of two-party conversation. The first is that one party speaks at a time. According to his 'distribution rule,' the answerer speaks first as it would irritate callers if the answerer was silent. Moreover, callers would not talk until the answerer says something first. Callers would then identify themselves to answerers and provide the first topic. This study provides a good example of how conversation analysis can elicit the patterns of naturally occurring talk.

Institutional talk

One of the major differences between conversation analysis and discourse analysis is the emphasis on context. Place, time, and identities of the participants are taken into consideration when conversation analysis is performed. In conversation analysis, the types of talk, whether during 'formal' or 'informal' interactions, ranging from a courtroom to a casual talk, are identified. This way the researcher may properly examine how the interaction and the context are related.

In this current study, these three major features of conversation analysis were applied focusing on students' reciprocal online natural interactions. Students' turn-taking and repair as well as conversational openings and adjacency pair were highlighted. In addition, this study also took into account

that an online context has its own unique characteristics. In order to systematically and consistently analyze students' communication strategies via voice-based online tools, students' conversations were audio-recorded and trascribed based on transcription conventions adapted from Markee and Kasper (2004), Silverman (2006), and MICASE (Rita, David, & Sheryl, 2007). Markee and Kasper (2004) present a transcription convention adapted from Atkinson and Heritage (1984), two of the pioneers of conversation analysis, to get a 'participant-relevant' perspective on language learning (p. 491). Silverman (2006) provides a simplified version which was easy to use. MICASE stands for The Michigan Corpus of Academic Spoken English. It is a spoken language corpus concerning academic speech within the University of Michigan, Ann Arbor, Michigan. Its symbols concerning people's action, (problematic) pronunciation, and students' errors were adapted to this current study because the researcher found these extra features were simply transcribed by MICASE (2007). According to Liddacoat (2007), trancribing data is not a 'once-for-all-time' representation of talk (p. 13). Its evolving nature requires researchers to produce different transcriptions to explain different aspects of the talk. This current study integrated the transcription conventions of Markee and Kasper (2004), Silverman (2006), and MICASE (2007) because they were applicable to the online talk, a focus of this study. Transcriptions used in this study are as shown below.

Table 2.1. Transcription Conventions (Markee & Kasper, 2004; MICASE, 2007; Silverman, 2006)

[	VO2: and [did you see any lake? VO6: [huh?	Left brackets indicate the point at which the current speaker's talk is overlapped by another's talk.
=	VO5: in the middle of the sea= VO8: =uh ha.	Equal signs, one at the end of the line and one at the beginning, indicate no gap between the two lines.
(2.0)	Because (2.0) I think it's good.	Numbers in parentheses indicate elapsed time in silence in tenth of a second.
(.)	this particular (.) texture of clothes.	A dot in parentheses indicates a tiny gap, probably no more than one tenth of a second.
___	<u>really</u>?	Underscoring indicates some form of stress, via pitch and/or amplitude.
::	O:::kay?	Colons indicate prolongation of the immediately preceeding sound. The length of a row of

	colons indicates the length of the prolongation.
CAP ….and MINE is after	Capitalsindicate especially loud sounds relative to the surrounding talk.
.hhhh	a row of h's prefixed by a dot indicates an inbreath.
hhhh	a row of h's without a dot indicates an outbreath.
xxx	unintelligible word (one x for one syllable)
<LAUGH> <Pronun: /krItilia/> <sic>	action student's pronunciation (criteria) errors made by students not typo.

2.7. Chapter Summary

The review of the literature has outlined the relevant research in differentiated instruction, project work, computer-mediated communication, speaking proficiency and assessment, communication strategies, and conversation analysis.

The studies concerning differentiated instruction provide useful guidelines for designing lessons that can better serve students' different needs. The project work frameworks from various experts suggest the instructional process to be adopted in the present study. Contributions of computer-mediated communication and communication strategies on language learning and English speaking proficiency were essential elements for designing the lessons. Conversation analysis was also a useful approach for investigating students' communication strategies.

CHAPTER III
RESEARCH METHODOLOGY

This chapter describes the research design, population and sampling method, research and instructional instruments, data collection, and data analysis.

3.1. Research Design

This was a mixed-method research study which adopted the quasi-experimental research method using a one-group pretest-posttest design to elicit quantitative data. In addition, it utilized research instruments such as students' audioblogs, voice chats and a semi-structured interview for the qualitative analysis.

3.2. Population and sampling

3.2.1. Population

The population of this study was 50 English-major students from the Faculty of Education at a public university in Thailand. They were pre-service teachers of English who spent five years completing the program with a one-year teaching practicum. Only those who gained 70% scores on the English Screening Tests were qualified to major in English.

3.2.2. Participants

The participants in this study were nine students from the English program who enrolled in 272531 Speech Improvement, an elective course designed to enhance students' English speaking proficiency focusing on English oral communication and daily social interactions. This course is offered in the first semester of every academic year. The class meets once a week for two hours. The average age of the participants was between 18-21 and all of them were fourth-year

students. After completing this elective course, students pursued the teaching practicum in the following year. This study adopted the purposive sampling technique for the selection of participants. This was because students' levels of English speaking proficiency should be at least at an intermediate level in order to successfully interact with one another via CMC while completing the project work during the DCP intervention.

Prior to the DCP intervention, the needs of students were analyzed. The information obtained from this process was utilized to primarily inform teachers on individual student's backgrounds, learning styles and strategies, and interests, which enabled teachers to design the suitable course content, instructional processes, and means of measurement. According to the results of the TOEIC Speaking Test, students were at the levels of intermediate and upper-intermediate speaking proficiency. The findings from the Multiple Intelligence Inventory, Topic of Interest Questionnaire, and Oral Interviews showed that most students were visual learners and interested in the topics of food, travel, and the environment. Their technological backgrounds varied from the beginning to advanced levels.

3.3. Research instruments

Five research instruments were used to elicit information from students to answer the research questions 1, 2, 3, and 4 which were the TOEIC Speaking Test, the Communication Strategy Inventory, students' audioblogs, students' voice chats, and a semi-structured interview (see Table 3.1).

Table 3.1 Research Instruments and Data Analyses

Research Questions	Instruments	Distribution	Data Analyses
Research question 1: To what extent does Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work (DCP) improve Thai undergraduate students' English speaking proficiency?	-TOEIC Speaking pre-test and post-test	-Weeks 1&12	-Descriptive statistics -Wilcoxon Matched-Paired Signed Ranks Test
Research question 2: What communication strategies do Thai undergraduate students use while participating in DCP?	-Communi-cation Strategy Inventory -Students' audioblogs - Students' voice chats	- Week 12 - Week 3 - Week 4	-Descriptive statistics - Conversation analysis
Research question 3: Is there any significant difference between Thai undergraduate students' perceived use of communication strategies before and after participating in DCP?	-Communi-cation Strategy Inventory	-Weeks 1 & 12	-Descriptive statistics -Wilcoxon Matched-Paired Signed Ranks Test

Research Questions	Instruments	Distribution	Data Analyses
Research question 4: What are Thai undergraduate students' opinions about DCP?	-Semi-structured interview	-Week 15	- Content Analysis

3.3.1. TOEIC Speaking Test

The TOEIC (Test of English for International Communication) Speaking Test developed by Educational Testing Service (ETS) was used as the English speaking pre-test and post-test in this study because it has been reported to have a high reliability coefficient--at the level of .82 (Powers et al., 2009). The test is designed to measure the test-takers' ability to communicate clearly in spoken English with tasks that are set in general and workplace contexts and does not require test-takers to have specialized knowledge of business. The TOEIC Speaking Test includes six different test types (11 items) to measure different aspects of speaking proficiency. Table 3.2 presents the TOEIC Speaking Test Tasks.

Table 3.2 TOEIC Speaking Test Tasks

Question	Task	Evaluation Criteria
1-2	Read a text aloud	-Pronunciation -Intonation and stress
3	Describe a picture	All of the above, plus -Grammar -Vocabulary -Cohesion

Question	Task	Evaluation Criteria
4-6	Respond to questions	All of the above, plus -Relevance of content -Completeness of content
7-9	Respond to questions using information provided	All of the above
10	Propose a solution	All of the above
11	Express an opinion	All of the above

The first task, *reading a text aloud*, is designed to test the test-takers' pronunciation, intonation and stress. The second task, *describing a picture*, is also designed to test the test-takers' pronunciation, intonation and stress like the first task; however, grammar, vocabulary and cohesion are added. The third task, *responding to questions*, is designed to evaluate test-takers' pronunciation, intonation and stress, grammar, vocabulary, cohesion, relevance of content and completeness of content. The last three tasks, *responding to questions using information provided, proposing a solution* and *expressing an opinion*, are designed to evaluate all criteria mentioned above, namely, pronunciation, intonation and stress, grammar, vocabulary, cohesion, relevance of content, and completeness of content.

To familiarize the students with the test tasks, the aforementioned six test tasks were included in the design of DCP lessons. Tasks 1 and 2 (to read a text aloud) were introduced to the students in week 5. Task 3 (to describe a picture) was introduced in week 4. Tasks 4-9 (to respond to questions) were introduced in week 2. Task 10 (to propose a solution) was introduced in week 8 and Task 11 (to express an opinion) was covered in week 5. The order of the tasks introduced in the lessons

did not follow that of the test because students were to follow the process of project work in order to complete a final project.

The same test was administered as the English speaking pre-test and post-test. Students' speaking proficiency was assessed by two raters using an analytical four-point scale assessment rubric designed by ETS as shown in Appendix A. The Wilcoxon Matched-Paired Signed Ranks Test was used to calculate changes in the students' English speaking proficiency.

3.3.2. Communication Strategy Inventory

Communication Strategy Inventory (CSI) is a self-reported 4-point Likert-scale questionnaire, ranging from 1 = Never, 2 = Seldom, 3 = Sometimes, to 4 = Often. It included 30 items designed to identify the students' communication strategies when communicating with conversation partners via voice CMC tools synchronously and asynchronously. The items on the Communication Strategy Inventory were in Thai to facilitate the students' comprehension. In this section, the development and validation processes of the Communication Strategy Inventory are discussed.

3.3.2.1. The development of Communication Strategy Inventory

The development of the Communication Strategy Inventory involved three major stages: reviewing related studies, analyzing students' voice chats and audioblogs, and constructing the inventory.

1. Reviewing related studies

Related literature and research studies had been explored in order to develop a conceptual framework for CSI. In this study, the frameworks of Tarone (1977), Corder (1983), Faerch & Kasper (1983), Bialystok (1990), Paribakt (1985), Willems

(1987), Dörnyei and Scott (2002) and Cohen and Dörnyei (2002) were adopted. However, the categories of communication strategies followed that of Cohen and Dörnyei (2002).

2. Analyzing students' voice chats and audioblogs

To make sure that such categories really existed in students' oral production while interacting online, the researcher used the categories as coding categories to analyze students' voice chats and audioblogs in the first pilot study in July 2009. It showed that all categories existed in students' oral production except 'asking for confirmation,' 'foreignizing' and 'topic avoidance.' In addition to this, the 'use of non-linguistic device' also did not exist in the online interaction which corresponded to Smith's (2003) study. The findings of his study informed us that non- and para-linguistic cues such as eye gaze, nods, intonation, and pitch used in spoken discourse to communicate meaning were absent in CMC exchanges. The findings from the analysis were used as coding categories in the main study and also for developing the Communication Strategy Inventory.

3. Constructing the inventory

This stage was associated with the format and questions on the inventory linked to face validity. The major components of the inventory development adopted from Bell (1993) and Dörnyei (2003) included length of the inventory, layout, and type of questions and question wording.

Length of the inventory

The maximum amount of time to complete the inventory should be taken into consideration. According to Dörnyei (2003), an inventory which is more than 4-6 pages long and requires more than an hour to complete may be regarded as a

burden on the respondents. The Communication Strategy Inventory is 1 page long and takes approximately 10 to 15 minutes to complete all thirty items.

Layout

A significant role of the layout is to motivate the respondents to answer the questions. Dörnyei (2003) suggests five elements which were adopted to improve the inventory in this study. Those were compactness, appropriate density, orderly layout, good quality paper, and proper sequence.

Type of questions and question wording

When constructing the items, the type of questions and question wording should also be taken into consideration. In this study, close-ended questions were used because they consumed less time for administration and tabulation. Words that were considered biased were eliminated. Table 3.3 presents categories and items of Communication Strategy Inventory. (See Appendix B)

Table 3.3 Categories and Items of Communication Strategy Inventory

Categories of CS (Cohen & Dörnyei, 2002)		**Items** (Adapted fromTarone, 1977, Corder, 1983, Faerch & Kasper, 1983, Bialystok, 1983, Paribakt, 1985,Willems, 1987, Dörnyei & Scott, 1997, Cohen & Dörnyei, 2002)	
Avoidance or reduction strategies	Message abandonment	1.	I leave a message unfinished when I am faced with some language difficulty.
		20.	I take risks using new words or forms even though I might make mistakes. (reversed)
	Topic avoidance	2.	I direct the conversation to familiar topics.

		17. I change the subject if I don't have the words I need. 19. I try to discuss new topics even though they aren't familiar to me. (reversed)
	Message replacement	3. I substitute the original message with a new one because of not feeling capable of executing it. 24. I replace the original message with another message because of feeling incapable of executing my original content.
Achievement or compensatory strategies	Approximation	5. I use an alternative term which expresses the meaning of the word I cannot remember as closely as possible. (For example, *ship* for '*sail boat*') 22. I look for a different way to express the idea, such as using a synonym. 4. I simplify my expressions when my conversational partner seems to be confused.
	Circumlocution	21. I describe or exemplify the target word I cannot remember. (*Ex. the thing you open bottles with* for '*corkscrew*')
	Use of all-purpose words	6. I use general terms such as '*thing, stuff, make, and do*' when I do not know the right word. 23. I use words which are familiar to me.

	Word-coinage	7.	I make up a new word which does not exist in English when I do not know what it is called. (For example, '*vegetarianist*' for *vegetarian)*
	Use of non-linguistic means	8.	I use sound imitation to convey the meaning.
	Literal translation	9.	I use a Thai word, idiom or structure when I do not know how to say it in English.
	Foreignizing	10.	I speak English with a Thai accent or with Thai ending particles such as 'na,' 'ka,' or 'krub.'
	Code switching	25.	I switch back to my own language momentarily if I know that the person I'm talking to can understand what is being said.
		27.	I avoid using Thai when communicating in English. (reversed)
Stalling or time-gaining strategies	Use of fillers and other hesitation devices	11.	I use fillers or gambits (e.g. well, now let me see, as a matter of fact) to fill pauses and to gain time to think.
	Repetition	12.	I repeat a word or a string of words immediately after they were said.
Interactional strategies	Appeal for help	13.	I turn to my conversation partner for help either directly (for example, 'What do you call…?') or indirectly (e.g., rising intonation, pauses, eye contact, puzzled expression).

	26.	I ask the speaker to use easy words when I have difficulty comprehending them.
Asking for repetition	14.	I request repetition when not hearing or understanding something properly. (e.g. 'Sorry?,' 'Pardon?')
	28.	I ask for repetition when I can't understand what the speaker has said.
Asking for clarification	30.	I make a clarification request when I am not sure what the speaker has said.
Asking for confirmation	18.	I request confirmation that I have heard or understood something correctly. ('You mean?,' 'Do you mean?')
Expressing non-understanding	15.	I tell my conversation partner verbally or nonverbally to show that I do not understand something (e.g. 'Sorry, I don't understand,' 'I think I've lost the thread').
	29.	I make clear to the speaker what I haven't been able to understand.
Interpretative summary	16.	I paraphrase my conversation partner's message to check that he or she has understood correctly (e.g. 'So what you are saying is….?', 'Let me get this right; you are saying that…..')

3.3.2.2. Validation of the Communication Strategy Inventory

After the development stage, the researcher performed the three stages of validation, namely, back translation, experts' validation, and the pilot study to confirm the content and construct validity. The three processes are discussed as follows:

1. Back translation

The Communication Strategy Inventory (CSI) was translated into Thai to facilitate students' comprehension of the items. The back translation technique was used to evaluate the quality of the translation. According to Hulin et al. (1983), this technique involves three steps. The original version of the instrument is first translated into the target language. The target language instrument is then translated back into the source language by a different translator. Finally, the back translated instrument is compared to the original instrument by an individual who has not been involved in any of the previous steps. Discrepancies are noted, and the troublesome items, questions or instructions are revised.

The CSI was translated into Thai by an experienced tertiary-level English teacher and back translated into English by another experienced tertiary-level English teacher. The two versions were compared, and the differences were noted by a third experienced tertiary-level English teacher. The troublesome items were revised.

2. Experts' validation

The CSI was inspected by three experts based on the communication strategy framework. Evaluation forms with a three-point rating scale, 0 = rejected, 1 = not sure, and 2 = accepted, were provided to the three experts. Mean scores from the experts were calculated and the items which did not score between 0.50 and 1.00

were revised according to the experts' suggestions. Table 3.4 illustrates the experts' validation of the Communication Strategy Inventory.

Table 3.4 Experts' Validation of the Communication Strategy Inventory

	Items	Mean	Results
1.	I leave a message unfinished when I am faced with some language difficulty.	**1.0**	**Accepted**
2.	I direct the conversation to familiar topics.	**1.0**	**Accepted**
3.	I substitute the original message with a new one because of not feeling capable of executing it.	**1.0**	**Accepted**
4.	I simplify my expressions when my conversational partner seems to be confused.	**1.0**	**Accepted**
5.	I use an alternative term which expresses the meaning of the word I cannot remember as closely as possible.	**1.0**	**Accepted**
6.	I use general terms such as '*thing, stuff, make, and do*' when I do not know the right word.	**1.0**	**Accepted**
7.	I make up a new word which does not exist in English when I do not know what it is called. (For example, '*vegetarianist*' for *vegetarian*)	**1.0**	**Accepted**
8.	I use sound imitation to convey the meaning.	**1.0**	**Accepted**
9.	I use a Thai word, idiom or structure when I do not know how to say it in English.	**1.0**	**Accepted**
10.	I speak English with a Thai accent or with Thai ending particles such as *'na,' 'ka,'* or *'krub.'*	**1.0**	**Accepted**

11.	I use fillers or gambits (e.g. *well, now let me see, as a matter of fact*) to fill pauses and to gain time to think.	**0.33**	**Revised**
12.	I repeat a word or a string of words immediately after they were said.	**1.0**	**Accepted**
13.	I turn to my conversation partner for help either directly (for example, 'What do you call…?') or indirectly (e.g., rising intonation, pauses, eye contact, puzzled expression).	**1.0**	**Accepted**
14.	I request repetition when not hearing or understanding something properly.	**0.33**	**Revised**
15.	I tell my conversation partner verbally or nonverbally to show that I do not understand something.	**1.0**	**Accepted**
16.	I paraphrase my conversation partner's message to check that he or she has understood correctly.	**1.0**	**Accepted**
17.	I change the subject if I don't have the words I need.	**1.0**	**Accepted**
18.	I request confirmation that I have heard or understood something correctly.	**1.0**	**Accepted**
19.	I try to discuss new topics even though they aren't familiar to me.	**1.0**	**Accepted**
20.	I take risks using new words or forms even though I might make mistakes.	**1.0**	**Accepted**
21.	I describe or exemplify the target word I cannot remember. (*Ex. the thing you open bottles with* for '*corkscrew'*)	**1.0**	**Accepted**

22.	I look for a different way to express the idea, such as using a synonym.	**1.0**	**Accepted**
23.	I use words which are familiar to me.	**1.0**	**Accepted**
24.	I replace the original message with another message because I feel incapable of executing my original content.	**1.0**	**Accepted**
25.	I switch back to my own language momentarily if I know that the person I'm talking to can understand what is being said.	**0.67**	**Accepted**
26.	I ask the speaker to use easy words when I have difficulties in comprehension.	**1.0**	**Accepted**
27.	I avoid using Thai when communicating in English.	**1.0**	**Accepted**
28.	I ask for repetition when I can't understand what the speaker has said.	**0.33**	**Revised**
29.	I make clear to the speaker what I haven't been able to understand.	**1.0**	**Accepted**
30.	I ask my conversation partner to clarify when I am not sure what the speaker has said**.**	**1.0**	**Accepted**

The CSI in the Thai version was distributed to the experts. Three items (11, 14, and 28) scored less than 0.05 and needed to be revised. However, the wording of several accepted items was also adjusted according to the experts' suggestions. Table 3.5 shows the revised items of Communication Strategy Inventory in the Thai version with the English translation.

Table 3.5 Revised Version of Communication Strategy Inventory

Original	Revised
1.ขณะสนทนา ฉันหยุดพูดเมื่อมีปัญหาทางภาษา I stop immediately when I have language problems.	ฉันทิ้งบทสนทนาค้างไว้เพราะมีปัญหาทางด้านภาษา I leave a message unfinished when I am faced with some language difficulty.
6.ฉันใช้คำที่มีความหมายกว้างๆ เช่น 'thing, stuff, make, do' เมื่อไม่รู้คำที่มีความหมายเฉพาะ I use words that have broad meaning such as thing, stuff, make or do when I know the exact words.	ฉันใช้คำที่มีความหมายกว้างๆ เช่น 'thing, stuff, make, do' เป็นต้น เมื่อไม่รู้คำที่มีความหมายเฉพาะ I use general terms such as '*thing, stuff, make, and do*' when I do not know the right word.
9. ฉันใช้คำและไวยากรณ์ไทย เมื่อฉันไม่รู้ว่าจะพูดเป็นภาษาอังกฤษ อย่างไร I use Thai words and Thai structure when I don't know how to say in English	ฉันใช้คำและโครงสร้างภาษาไทย เมื่อฉันไม่รู้ว่าจะพูดเป็นภาษาอังกฤษว่าอย่างไร I use a Thai word, idiom or structure when I do not know how to say it in English.
11.ฉันมักใช้คำเติมช่วงเงียบ (filler) เมื่อฉันต้องการหยุด หรือยืดเวลาในการคิด I often used fillers when I have to stop to think or need time to think.	ฉันมักใช้คำเติมช่วงเงียบ เช่น well, now let me see, as a matter of fact เมื่อฉันต้องการหยุดหรือยืดเวลาในการคิด I use fillers or gambits (e.g. *well, now let me see, as a matter of fact*) to fill pauses and to gain time to think.
14.ฉันขอให้คู่สนทนาพูดซ้ำเมื่อไม่เข้าใจสิ่งที่เขาพูด I ask my conversation partner to repeat when I don't understand what he or she said.	ฉันขอให้คู่สนทนาพูดซ้ำเมื่อฉันไม่แน่ใจว่าได้ยินหรือเข้าใจสิ่งที่เขาพูดถูกต้องหรือไม่ I request repetition when not hearing or understanding something properly.
15.ฉันบอกคู่สนทนาว่าฉันไม่เข้าใจสิ่งที่เขาพูด I told my conversation partner that I don't understand what he or she said.	ฉันบอกคู่สนทนาทั้งด้วยคำพูดและด้วยท่าทางหรือสีหน้าว่าฉันไม่เข้าใจสิ่งที่เขาพูด I tell my conversation partner verbally or nonverbally to show that I do not understand something.
16.ฉันทวนคำพูดของคู่สนทนาเพื่อตรวจสอบว่าฉันเข้าใจถูกต้องหรือไม่ I check my understanding by repeating what my conversation	ฉันทวนคำพูดของคู่สนทนาโดยใช้ประโยคที่สามารถเข้าใจได้ง่ายเพื่อตรวจสอบว่าฉันเข้าใจคำพูดของเขาถูกต้องหรือไม่ I paraphrase my conversation partner's

partner just said.	message to check that he or she has understood correctly.
18.ฉันขอความมั่นใจจากคู่สนทนาว่าฉันเข้าใจที่เขาพูดอย่างถูกต้อง I ask for confirmation from my conversation partner whether I understand correctly.	ฉันขอให้คู่สนทนายั้ำให้แน่ใจว่าฉันเข้าใจในสิ่งที่เขาพูดอย่างถูกต้อง I request confirmation that I have heard or understood something correctly.
25.ฉันพูดไทยสลับกับภาษาอังกฤษถ้าทราบว่าคู่สนทนาเข้าใจภาษาไทย I switch back and forth from Thai and English if I know that my conversation partner can understand Thai.	ฉันพูดไทยสลับกับภาษาอังกฤษถ้าทราบว่าคู่สนทนาจะเข้าใจสิ่งที่ฉันพูด I switch back to Thai momentarily if I know that the person I'm talking to can understand what is being said.
28. ฉันขอให้คู่สนทนาพูดซ้ำเมื่อฉันไม่เข้าใจ I ask my conversation partner to repeat when I don't understand.	ฉันขอให้คู่สนทนาพูดซ้ำเมื่อฉันไม่เข้าใจสิ่งที่เขาพูด I ask my conversation partner for repetition when I can't understand what the speaker has said.
30.ฉันร้องขอความชัดเจนในสิ่งที่ฉันไม่แน่ใจในสิ่งที่คู่สนทนาพูด I ask for clarification when I am not sure what my conversation partner just said.	ฉันขอให้คู่สนทนาชี้แจง/ ให้ความกระจ่าง เมื่อฉันไม่แน่ใจในสิ่งที่เขาพูด I ask my conversation partner to clarify when I am not sure what the speaker has said**.**

3. The pilot study of the Communication Strategy Inventory

The CSI was pilot tested with 50 English-major students who were representatives of the population but were not participants of the main study. Cronbach's alpha internal consistency was used to estimate its reliability.

The CSI was distributed to the English-major students in the first and final weeks of the implementation of the main study. Wilcoxon Matched-Paired Signed Ranks Test was used to study changes in the Thai undergraduate students' communication strategies used via CMC. In addition, to heighten the reliability of the findings obtained from the Communication Strategy Inventory, the findings from an analysis of students' voice chats and audioblogs were used for triangulation.

3.3.3. Students' voice chats

Voice chat is a synchronous voice CMC tool that allows its users to call and speak to another user or users utilizing another computer or landline telephone. In DCP, voice chats were used as a tool to stimulate students' online interaction with their peers in real time and to elicit communication strategies that the students used while completing tasks that led to a completion of their final projects. The voice chat programs were installed in each computer prior to the class time because a security system at the language lab allowed a new program to be installed only temporarily. In addition, log-in names and passwords were prepared for the students by the instructor so that students were anonymous to one another to help lower their anxiety of loosing face when making mistakes (Kelm, 1996).

3.3.3.1. The pilot study of voice chats

The voice chat was introduced to 17 Thai university students during the first three-week pilot study at the end of July 2009. It was used as a means of communication for the teacher to students and students to students and also for performing the task. In the first week of the pilot study, students used the voice chats in pairs to brainstorm about environmental problems. This activity aimed to stimulate students' motivation to speak and to elicit students' communication strategies.

The findings from the first pilot study showed that even though students were highly motivated by the voice chat, they could not use the tool effectively due to having insufficient time to familiarize themselves with the tool. Secondly, the task that required the students to discuss environmental problems was so broad that students lost the focus of their discussion.

Based on the findings from the first pilot study, the duration of the task was extended and the task was adjusted as follows:

On the second week of the implementation of the main study, the voice chat was introduced to the students for the first time (the first week was the course introduction), and the task that students were to perform to elicit their communication strategies was assigned in the third week. There were two main reasons for this. Firstly, an orientation on the voice chat was conducted a week before the students performed the task. Therefore, students should be more familiar with the tool and able to use it more effectively. Secondly, the task designed for the third week (describing pictures of global warming), aimed to reduce the scope of the topic concerning environmental problems and promote students' negotiation of meaning and interaction. This activity provided a rich source of communication strategies to be analyzed in the main study.

3.3.4. Students' audioblogs

Audioblogs combine blog and audio file technology. Users can post audio files online, instead of or in addition to text files, and share these files with an audience. The entries are catalogued by date and time and are stored as an audio portfolio. The audioblog service used in this study allows users to record their discussions and post them onto the website. It does not require a particular program to be installed; therefore, it is convenient to use. In addition, it provides the user's profile or portfolio that reports the history of each user's contribution to the blog so that the instructor can keep track of students' work. In the next section, the pilot study, the findings of the pilot study, and an analysis of the audioblog are discussed.

3.3.4.1. The pilot study of audioblogs

The audioblog was pilot tested in July 2009 with 17 Thai undergraduate students. During the three-week pilot study, it was introduced in the third week to familiarize the students with the tool and to perform a reading aloud task. Similar to

the voice chat, log-in names and passwords for the audioblogs were prepared for students by the instructor to maintain anonymity and lower students' affective filters.

The findings from the first pilot study on the audioblog reported that students did not have sufficient time to explore the tool because there was a large amount of content being taught that week. In addition, the task that required students to read a text aloud via the audioblog and record it in an MP3 file format did not provide information on students' communication strategies. Therefore, it was essential to adjust the classroom activities concerning the use of the audioblog as follows:

During the first week of implementation, students spent one hour exploring the tool. The task to elicit students' communication strategy use was assigned on the fourth week during which students recorded their reflections on the project plan and assessment rubric via the audioblog. It is believed that students should use their communication strategies when expressing their opinions in this task much more than in a reading aloud task.

3.3.4.2. Analysis of voice chats and audioblogs

Students' voice chats and audioblogs were transcribed based on transcription conventions of Markee and Kasper (2004), Silverman (2006), and MICASE (2002) for conversation analysis. Conversation analysis was adopted in this study because it allows for the analysis of a broad array of oral productions including, for example, sound lengthening, volume of voice, and level of pitch that may indicate the use of communication strategies. It resulted in categories of communication strategies for coding. These communication strategies were categorized by the researcher and an experienced tertiary-level English instructor using a card sorting technique (Nunan and Bailey, 2009).

The major categories of communication strategies that emerged from students' audioblog transcripts included *strategies for compensating for the unknown words* (compensatory strategies), *strategies used for gaining more time* (time-gaining strategies), *strategies for emphasizing* (emphasis), and *strategies used for unsuccessful execution* (avoidance strategies). For the voice chat, all of the above strategies existed including interactional strategies which were divided based on the two roles of the user: *a speaker* and *an interlocutor*. The speaker was the one who initiated the talk, while the interlocutor was the one who responded. The definitions and categories of communication strategies that emerged from students' transcriptions of voice chats and audioblogs are shown in Appendix C.

3.3.5. Semi-structured interview

The semi-structured interview was conducted at the end of the implementation to elicit students' opinions toward the DCP. It consisted of nine questions. Questions one to eight were designed to examine students' opinions about the benefits and drawbacks of DCP, and question nine was to elicit students' suggestions on how to improve the course. (See Appendix D).

3.3.5.1. Validation of semi-structured interview questions

The eight semi-structured interview questions were validated by the three experts based on the DCP framework and instructional manual and lesson plans, using the evaluation form of item content congruence and applicability. Mean scores from the three experts were calculated and the items which did not receive a score between 0.50 and 1.00 were revised according to their suggestions.

3.3.5.2. Findings of the validation of semi-structured interview

Table 3.6 shows mean scores obtained from the experts' validation. All items except item 2 and item 4 were rated 1.0 which meant that there was a consensus on accepting these items to be used in this study. However, the experts suggested that the sequence of the items should be rearranged. Items 2 and 4 were commented to be content-oriented. Therefore, item 2 was eliminated and item 4 was adjusted.

Table 3.6 Experts' validation of semi-structured interview

Items	Mean	Results
1. What was the best thing you learned from this course?	**1.0**	**Accepted**
2. What did you learn from the topic you researched?	**0.33**	**Revised**
3. How did your English speaking improve while doing this project?	**1.0**	**Accepted**
4. What did you learn about using technology?	**0.67**	**Accepted**
5. What are the difficulties you faced when completing the project?	**1.0**	**Accepted**
6. How do you like the classroom atmosphere that incorporates DCP?	**1.0**	**Accepted**
7. What are the three words (adjectives) you would use to describe this course?	**1.0**	**Accepted**
8. Please give some suggestions to help improve this course.	**1.0**	**Accepted**

Table 3.7 shows the revised version of semi-structured interview questions. The experts suggested that the interview should start by eliciting the students' feeling in general. Then the items towards positive and negative attitudes should be balanced. These questions were only the key interview questions. There were also follow-up questions and probes that were naturally asked during the interview.

Table 3.7 Revised version of the semi-structured interview

1. What was the best thing you learned from this course?	1. How did you feel about this course (in general)?
2. What did you learn from the topic you researched?	2. How did your English improve while doing the project work?
3. How did your English speaking improve while doing this project?	3. How did the technology used in the project work help you to learn English?
4. What did you learn about using technology?	4. What are the difficulties you faced when completing the project?
5. What are the difficulties you faced when completing the project?	5. What are the pros and cons of having the classroom atmosphere that incorporates DCP?
6. How do you like the classroom atmosphere that incorporates DCP?	6. What are the three words (adjectives) you would use to describe this course?
7. What are the three words (adjectives) you would use to describe this course?	7. What was the best thing you learned from this course?
8. Please give some suggestions to help improve this course.	8. What do you like least about this course?
	9. What would you do to make this course more interesting and worthwhile for all learners.

The semi-structured interview questions were pilot-tested twice. The findings of both pilot studies are discussed as follows:

3.3.5.3. Pilot study of the semi-structured interview (1)

In the first pilot study, the interview was administered by having all 17 students record their responses to three questions adopted from Dudeney & Hockly (2007) using a program for voice recording at the language lab and email their voice files in the MP3 format to the instructor. It was found that the interview in this pilot study was conducted in a structured manner that did not allow the researcher to gather in-depth information.

3.3.5.4. Pilot study of the semi-structured interview (2)

The objective of the second pilot study of the semi-structured interview was to validate the revised version of semi-structured interview questions. Four students attending the pilot study were randomly selected for the interview. The findings showed that the sequence of interview items was proper, and the content of the items was clear and effectively elicited students' attitudes as intended.

To elicit more in-depth information from the students, the interview was performed in a less structured manner in the main study. All nine students were interviewed. Even though the questions were prepared in English, students were allowed to respond in both English and Thai. To encourage true reflections of students on the DCP, the interviews were conducted three weeks after the end of the implementation of the main study after the students' grades on the final projects had been reported. The interviews were audio-recorded and digitally saved in the MP3 file format. The data were translated, transcribed and categorized by the researcher.

3.4. Research Procedure

This study aimed to develop a speaking intervention (DCP) to enhance Thai undergraduate students' English speaking proficiency. The intervention was based on the frameworks of the following three theories: differentiated instruction, computer-mediated communication, and project work. The research procedure consisted of two main phrases: the preparation of the DCP and the implementation of DCP as shown in Table 3.8.

Table 3.8 Research procedure

Phase 1: Preparation of DCP	
1.	Analyzing documents and reviewing related studies
2.	Conducting learners' analyses
3.	Designing DCP
4.	Performing the pilot test of DCP lessons (1)
5.	Redesigning DCP
6.	Validating DCP
7.	Performing the pilot test of DCP lessons (2)
Phase 2: Implementation of DCP	
1.	Administering the pre-test and distributing the Communication Strategy Inventory (1)
2.	Conducting the main study and collecting data from voice chats and audioblogs
3.	Administering the post-test
4.	Distributing the Communication Strategy Inventory (2)
5.	Conducting the semi-structured interview

3.4.1 Preparation of DCP

The first phase of the research procedures was the preparation stage of DCP. It comprised six major steps: 1) analyzing documents and reviewing related studies, 2) conducting learners' analyses, 3) designing DCP, 4) performing the pilot test of DCP lessons (1), 5) validating DCP, and 6) performing the pilot test of DCP lessons (2). These six mains steps are discussed as follows:

3.4.1.1. Analyzing documents and reviewing related studies

The DCP was implemented as a part of Speech Improvement, a course designed for English-major students at the Faculty of Education at a public university in Thailand. In order to design an intervention effectively, documents such as the course description and course objectives were analyzed and the theoretical frameworks were extensively studied.

1. Course description of Speech Improvement

The course description of Speech Improvement concerns proper English oral production and practices for English pronunciation. It also included a study of speech problems of non-native English speakers and their treatments.

The content of DCP was designed in relation to the course description by exposing the students to authentic tasks and texts that provided the students with opportunities to practice and monitor their English speaking and pronunciation while completing project work. The foci of this course were on English oral communication and practices on English pronunciation, especially the suprasegmental features, such as sentence stress, rhythm and intonation.

2. Course objectives of Speech Improvement

Even though the course objectives of Speech Improvement were specified by the curriculum developer, they needed to be adjusted to fit in the framework of DCP incorporating technology and project work. The objectives of both instructions are illustrated in Table 3.9 below.

Table 3.9 Course objectives

Course Objectives	
Speech Improvement	DCP
After completing the course, students should be able to:	After completing the course, students should be able to:
1. Speak clearly and fluently with correct stress, rhythm and intonation.	1. Make intelligible pronunciation with proper sentence stress, rhythm and intonation.
2. Overcome the problems of understanding and being understood by other speakers of English.	2. Make an utterance that is appropriate to specific social situations.
3. Participate in social interactions in English outside the classroom.	3. Utilize the CMC tools as means to communicate with peers and the teacher.
4. Synthesize and apply the knowledge learned from authentic texts and speech in class to their daily lives.	4. Produce and evaluate a multimedia project work.

3. The DCP framework

To develop a framework of DCP, related theories were explored from textbooks, journal articles and research papers. The theories reviewed for the study included differentiated instruction, computer-mediated communication and project work which are summarized as follows:

Differentiated Instruction

Differentiated instruction is based on the premise that there is variability among learners and that teachers should adjust their instructional approaches to serve students' readiness levels, interests and learning profiles. Tomlinson (2000a), Tomlinson and Cooper (2006), Rock et al. (2008) and Corley (2005) suggest that content, process and product should be modified as this will help maximize students' learning. According to Corley (2005), content can be modified by providing students with different degrees of complexity and allowing multiple accesses to the content. The process can be modified by flexible grouping and varying process for learning. The product can be modified by providing multiple choices for students to demonstrate their learning. Hall (2002) supports that prior to the instructional design, teachers or curriculum designers should have a thorough knowledge of the gist of what is to be taught (curriculum) and also have an insight into their learners so that they can plan instruction effectively.

The synthesis of all frameworks stated above is shown in Figure 3.1.

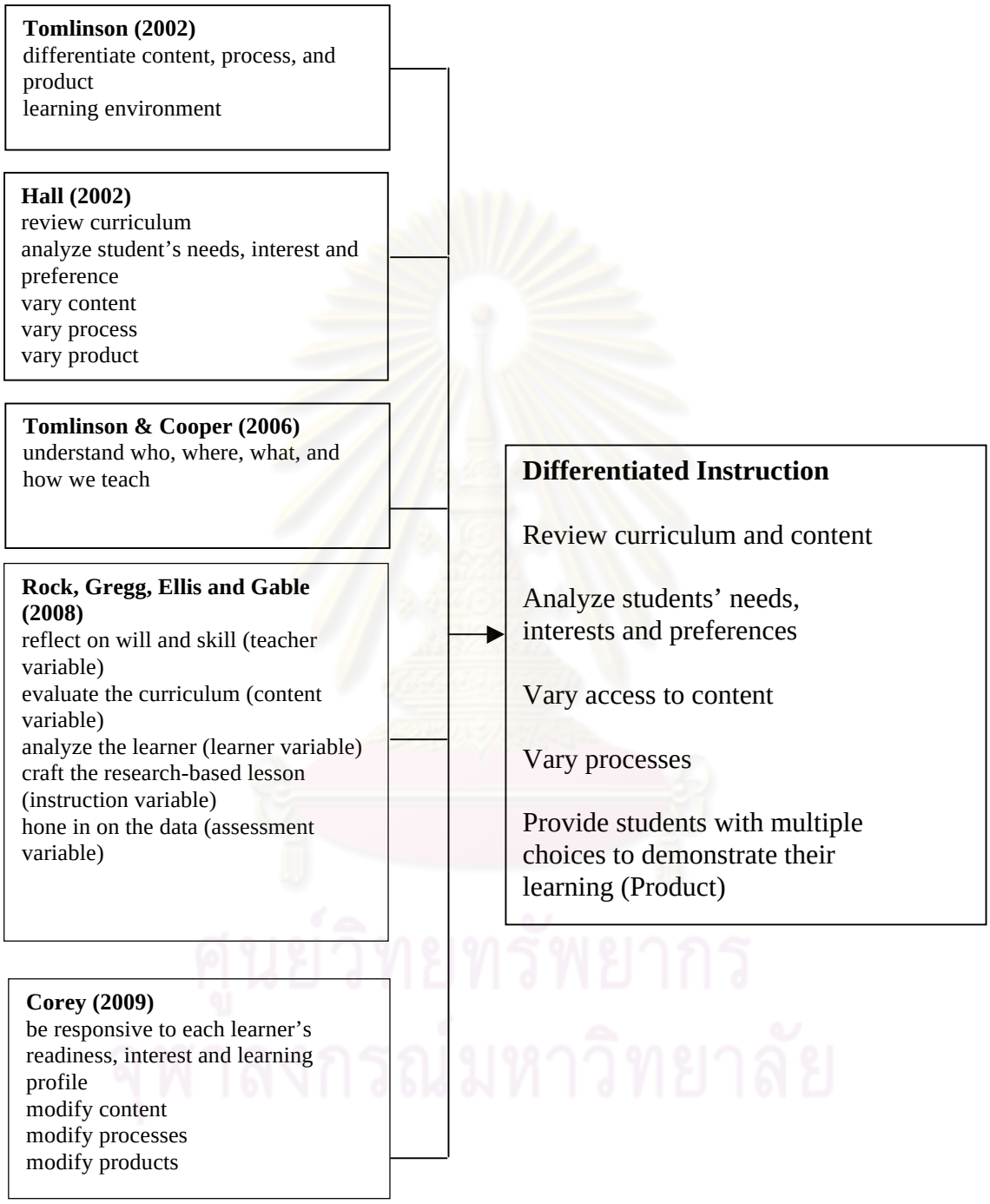


Figure 3.1 Differentiated instruction

2. Computer-mediated communication

Many studies have reported the benefits of computer-mediated communication (CMC) in second language acquisition. Chinnery (2005) states that CMC provides equal participation among students and promotes negotiation of meaning. Mills (2006) and Lamy and Hample (2007) add that it promotes student-centered learning, collaborative learning, scaffolding and life-long learning. Even though CMC is categorized into synchronous and asynchronous modes, their aims for use are similar. Abrams (2003) reports that text chat (synchronous tool) and bulletin board (asynchronous tool) promotes students' input and output, negotiation of meaning and collaborative learning. Likewise Pan and Sullivan (2005), who used Skype, Volle (2005), who used MSN text chat, and Jeon-Ellis, Debski and Wiggleworth (2005) and Satar and Ozderner (2008), who used text-based chat and voice chats in their studies, have reported the same benefits. Comprehensible input and output were promoted when students interacted with each other and tried to be understood by their interlocutor. Negotiation of meaning and collaborative learning were developed when students worked in groups and finally scaffolding was provided by their teachers when students were encountering difficulties. In Figure 3.2, all major characteristics of CMC are illustrated.

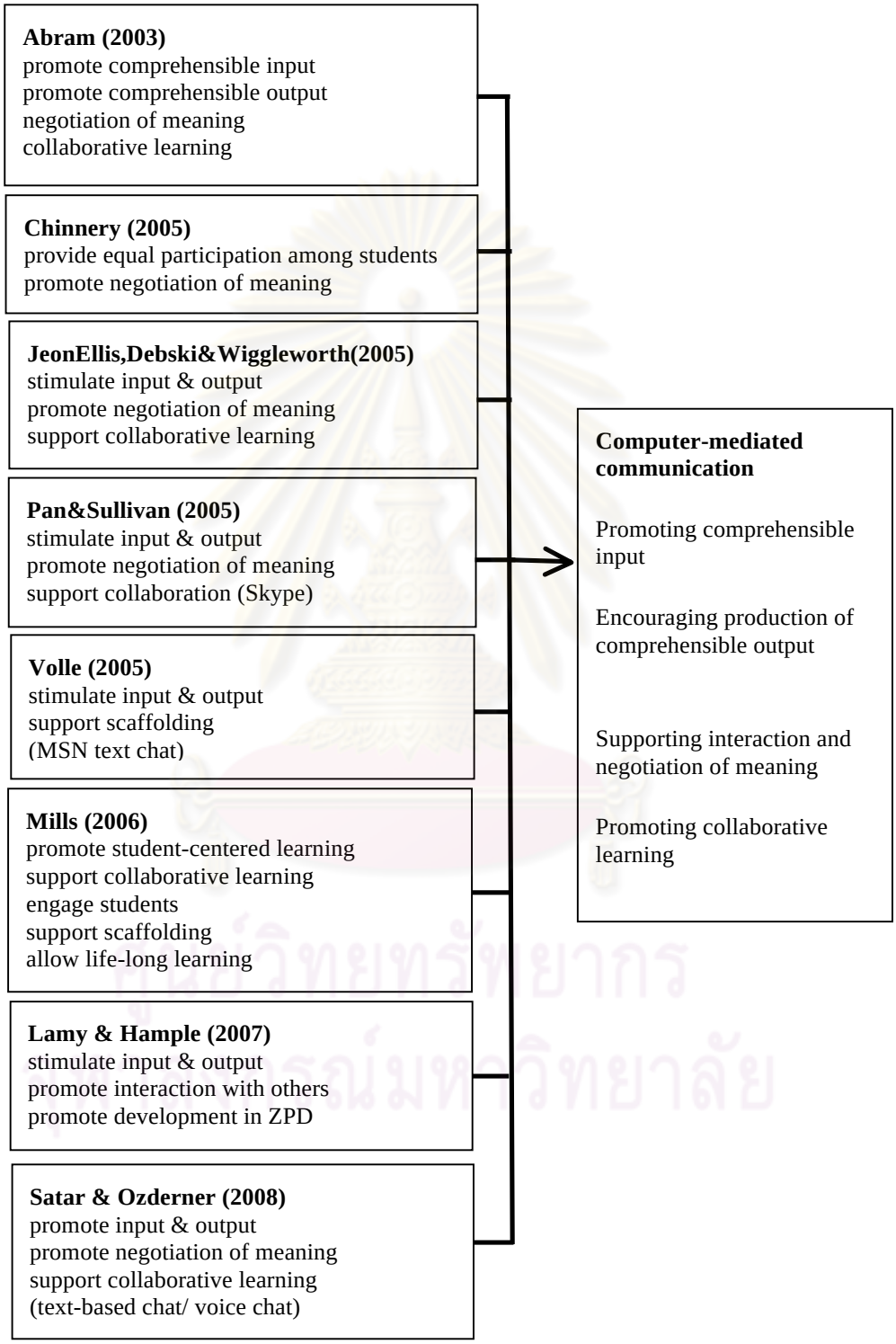


Figure 3.2 Computer-mediated communication

3. Project Work

Frameworks proposed by Fried-Booth (2002), Alan and Stroller (2005), Debski (2006) and Mills (2006) were adapted to construct the instructional process of this study. The main stages included the preparation stage, presentation stage, practice stage, assessment stage and follow-up stage as presented in Table 3.10. In the preparation stage, students' motivation, goals and interests were identified. Then, the teacher and students collaboratively chose the topic, determined the outcome based on their preference and identified tasks that would help them achieve such a goal. In the presentation stage, the teacher identified students' background knowledge and prepared them for the language needs by means of direct instruction or self studying. In the practice stage, students performed the assigned tasks collectively or individually. The teacher would monitor and provide support if needed. In the assessment stage, students presented their final products and were assessed by themselves, their peers and the teacher based on the Project Work Assessment Rubric. Finally, in the follow-up stage, the teacher provided a wrap-up session to inform students of their performance and addressed their language and technological needs.

Table 3.10 Project Work Frameworks

Main stages	Framework for this study	Fried-booth (2002)	Alan and Stoller (2005)	Debski (2006)	Mills (2006)
Preparation	1.identify students' motivation, goals and interests 2. choose the topic 3. determine the outcome 4. identify tasks	Planning stage 1.discuss scope and content of the project 2. discuss language needs and end products 3. set realistic objectives	1.agree on the theme 2.determine the outcome 3.structure the project	1. Incubation (brain storming) 2. Awareness (students' motivation, goal, experience) 3. Investment (establishing community to use target language)	1. identify curriculum-based goal for student learning 2. determine the learning objectives 3. identify the final product 4. establish assessment protocol based on learning objectives, process of learning and products
Presentation	5. prepare for language demand 6. identify information resources		4.prepare for student language demand for (5) 6. prepare language for (7) 8. prepare language for (9)	4. Justification (educate students about the project)	5. identify and define learning tasks and information resources and describe their uses

Main stages	Framework for this study	Fried-booth (2002)	Alan and Stoller (2005)	Debski (2006)	Mills (2006)
Practice	7. perform tasks	Implementation stage 4. Ss complete tasks 5. T supports and monitors	5. gather information 7. compile and analyze the information	5. Creation (research-communicate-develop-reflect) 6. Donation	6. structure and sequence the learning tasks 7. rehearse the learning tasks
Assessment	8. present the final product 9. conduct self-assessment, peer-assessment and teacher-assessment (by rubrics collaboratively generated)	Creation of the end product 6. can be different forms of end product 7. promote collaborative learning 8. use formal or informal evaluation	9. present final product 10. evaluate	7. Assessment (questionnaire, checklist, diaries)	
Follow-up	10. provide follow-up program for language and technological needs	9. T provides follow-up program to address language needs			

3.4.1.2. Conducting learners' analyses

Based on differentiated instruction, the needs of students should be analyzed prior to designing instruction. Four instruments were employed to assess students' English speaking proficiency, learning styles and strategies, interests, and technological background, as well as to guide the DCP instructional design. They were the (1) TOEIC Speaking Test, (2) Multiple Intelligence Inventory, (3) Topic of Interest Questionnaire, and (4) Oral Interviews. According to the results of the TOEIC Speaking Test, students were at the levels of intermediate and upper-intermediate speaking proficiency. The findings from the Multiple Intelligence Inventory, Topic of Interest Questionnaire, and Oral Interviews showed that most students were visual learners and they were interested in the topics of food, travel, and the environment. Their technological backgrounds varied from the beginning to advanced levels. The audio-visual instructional materials and course website were developed to differentiate each instructional level, facilitate students to learn at their own pace, as well as meet the needs of each individual.

3.4.1.3. Designing DCP

Based on the two previous steps, the DCP audio-visual instructional materials and course website were developed to differentiate each instructional level, facilitate students to learn at their own pace, as well as meet the needs of each individual. The three frameworks of Differentiated Instruction, Computer-Mediated Communication and Project Work were synthesized to develop the content, instructional processes, and product of the DCP (see Figure 3.3). In the next section, the design of the DCP including content, process, and product and its pilot studies and findings are discussed.

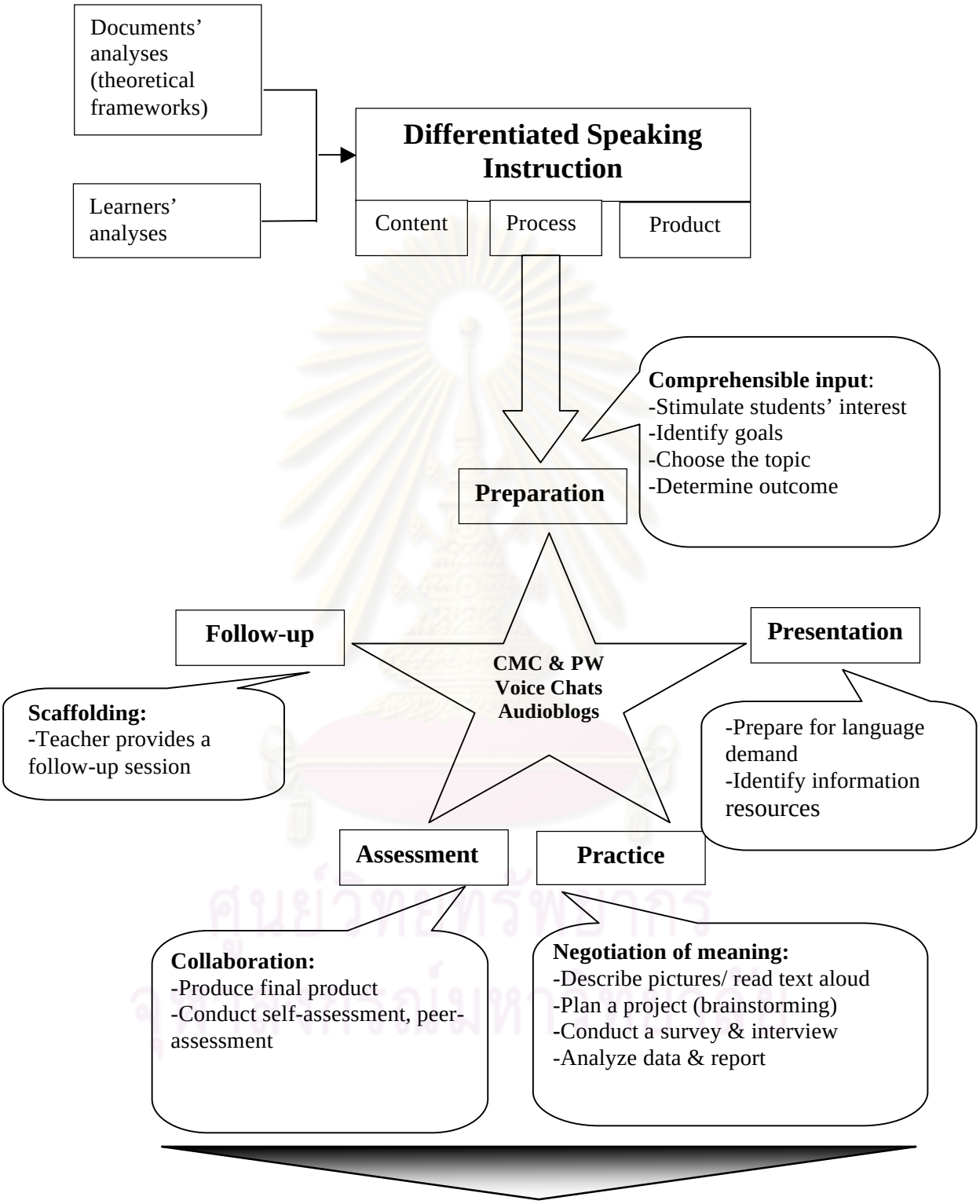


Figure 3.3 Instructional Model of DCP

1. The Content

Based on differentiated instruction, the content should be differentiated by providing the students with multiple accesses to content. In the DCP, students would learn the content in the classroom (face-to-face), from a website (online), or from the videos (self-study). The teacher would monitor each student's learning and provide support by suggesting supplementary materials that were appropriate for the levels of the students. Figure 3.4 is the webpage of the course where students could review the lessons and perform tasks.

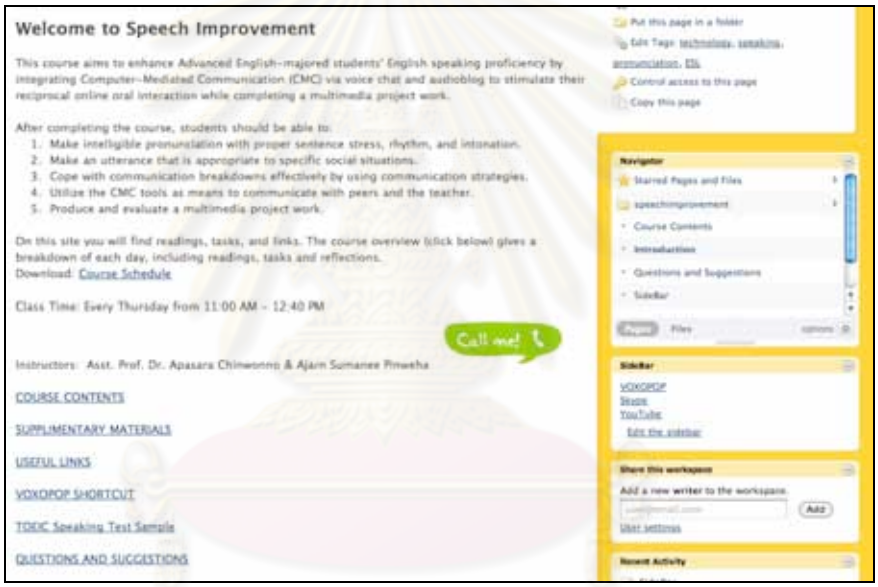


Figure 3.4 The course webpage

2. The instructional processes

The instructional processes of DCP included five main stages: the preparation stage, the presentation stage, the practice stage, the assessment stage and the follow-up stage.

The preparation stage

In the preparation stage, students' motivation, goals and interests were identified. Then, the teacher and students collaboratively chose the topic, determined the outcome based on their preference and identified tasks that

helped them achieve the goal. Figure 3.5 identifies the tasks that students were to perform to complete the project.

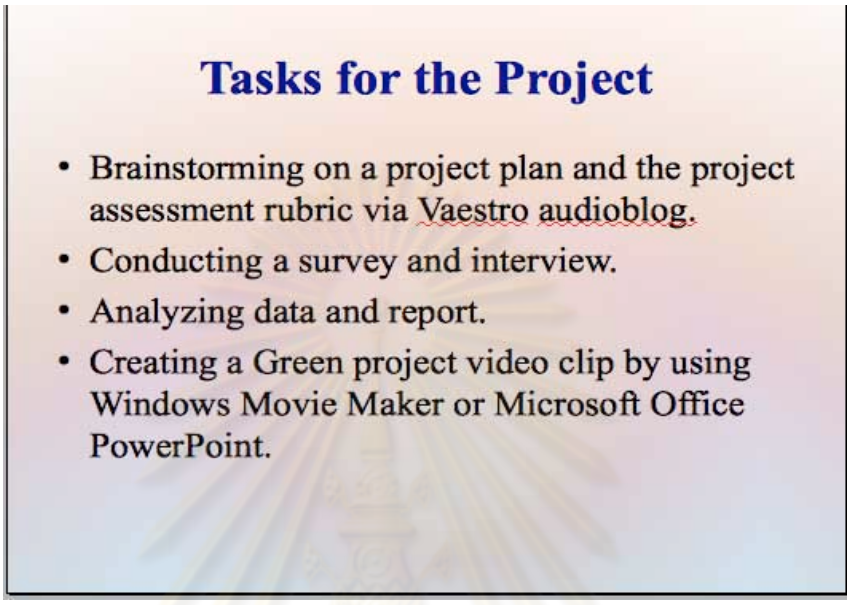


Figure 3.5 Preparation stage

The presentation stage

In the presentation stage, the teacher identified students' background knowledge and prepared them for the language needs by means of direct instruction or self-study. Figure 3.6 demonstrates the content covered in the lesson which included the language components and the technology.

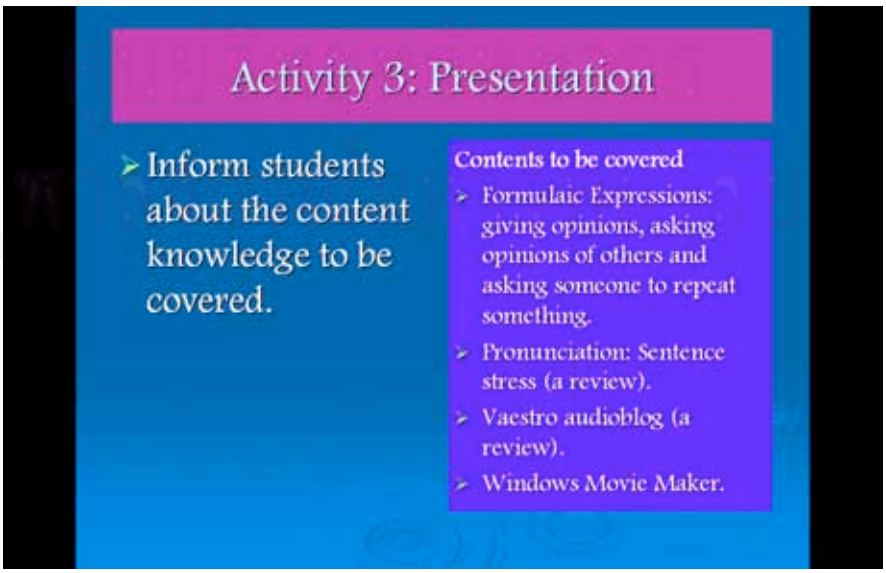


Figure 3.6 Presentation stage

The practice stage

In the practice stage, students performed the assigned tasks either collectively or individually. The teacher monitored and provided support such as by suggesting resources for an extra practice on the language or the technology. Figure 3.7 shows the tasks that students performed.

.

Figure 3.7 Practice stage

The assessment stage

In the assessment stage, students presented their final projects and were assessed by themselves, their peers and the instructor based on the Project Work Assessment Rubric. Figure 3.8 demonstrates the audioblog that the students used to reflect on their peers' final projects.

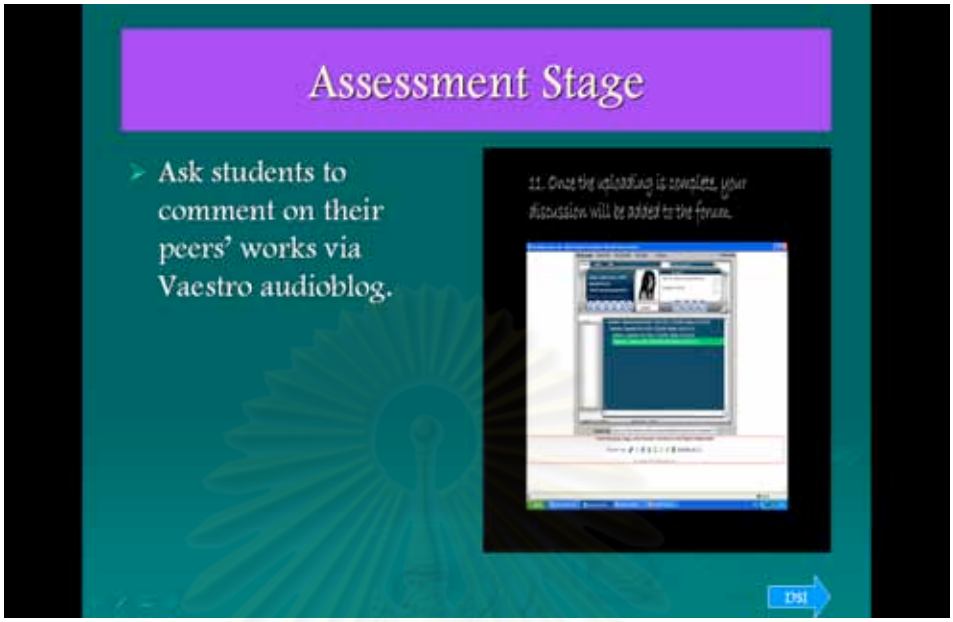


Figure 3.8 Assessment stage

The follow-up stage

In the follow-up stage, the teacher provided a wrap-up session to inform the students of their performance and addressed their language and technological needs. Figure 3.9 summarizes the content covered in the wrap-up session.

Figure 3.9 Follow-up stage

While following each stage, students' discussions were mediated via the CMC tools (voice chats and audioblogs) to promote comprehensible input and output, negotiation of meaning, collaboration, and scaffolding. The tasks designed to promote students comprehensible input in the preparation stage included describing pictures, reading a text aloud and planning for the project. In the presentation stage during which the students were encouraged to produce comprehensible outputs, content which included speaking, pronunciation and CMC was introduced to the students. Students extensively practiced the content learnt during this stage. In the practice stage, the lessons were designed to stimulate students' negotiation of meaning. The tasks in this stage included conducting a survey and interview, analyzing data, and reporting the findings. In the assessment stage, collaboration among students was promoted. Students were encouraged to assess and reflect on their peers' project work. Finally, in the follow-up stage, the teacher helped scaffold students' learning by providing a wrap-up session that focused on students' errors and language and technological needs. It was believed that upon completing the project work, students' English speaking proficiency and communications strategies should be enhanced.

The product

For the product of DCP, students' final projects varied based on the students' technological background. However, the same Project Work Assessment Rubric was used to assess all students' final products. The Project Work Assessment Rubric is a developed rubric created by the researcher acting as an instructor and the students (participants in this current study) based on the studies of Debski (2006), Kayser (2002), Yamak (2008) and ETS (2007). It covered two major components: audio-visual production and oral production. The criteria for audio-visual production consist of content, organization, attractiveness, and synthesis of materials. The criteria for oral production include pronunciation, intonation, structure, and vocabulary. The scale ranged

from 1 = Amateur, 2 = Admirable, and 3 = Exceptional (see Appendix E). Figure 3.10 presents an example of a student's final project.

Figure 3.10 Student's final project.

3.4.1.4. Performing the pilot test of DCP lessons (1)

The DCP lessons were pilot-tested twice. The objective of the first pilot study of the DCP lessons was to validate the construct of the lessons. The pilot study was carried out for three consecutive weeks during the end of July and the first week of August with 17 English-major students in the first semester of academic year 2009 by the researcher acting as the instructor. The three lessons, 'Let's brainstorm!,' 'Hunt for information,' and 'Ready to perform?' were covered during these three weeks.

Week One: Let's brainstorm!

The main goals of this lesson were to familiarize the students with the synchronous voice chats, and to introduce the students to useful expressions (such as agreeing and disagreeing, giving an opinion, asking for the opinion of others, and asking someone to repeat something) and pronunciation (sentence stress) needed for completing the weekly project work assignment. In the first

week, students were to hand in their recorded discussions via the voice chat on environmental problems and their agreement or disagreement on the criteria in the Project Work Assessment Rubric.

Week Two: Hunt for information

The goal of this lesson was to equip the students with the language and skills needed for data gathering via an online interview and online information search. Similar to the first lesson, useful expressions (e.g. interviewing someone) and pronunciation (rising intonation in yes/no questions) needed for completing the task were introduced. For this lesson, students were provided with ten structured interview questions that required their five add-on items. The students were to interview an online partner who was anonymous to them via the voice chat and hand in the recorded interview the following week.

Week Three: Ready to perform?

The goal of this lesson was to introduce the students to the audioblog, an asynchronous CMC tool, and the pronunciation needed for performing effective speech (prominence, thought groups and intonation). In the lesson, students viewed several examples of good speech and students' multimedia project work downloaded from www.youtube.com. The project work assignment for this week was to record speech on the passage provided via the audioblog.

After the implementation of the three lessons, the researcher found several aspects to be reconsidered. Firstly, it was revealed that there was too much content and language focus to be covered each week. According to Warschauer (1996), 'dual immersion' should be performed when implementing computer technology in a language classroom. The balance of the two disciplines--CMC and language--should be carefully designed. In the three lessons stated above, a majority of time spent was on the technology resulting in the insufficient language practice. Therefore, the scope and sequence were revised by separately introducing the CMC tools in the first two weeks of

instruction so that students would become more familiar with each tool when it was integrated into the project work process. In the main study, CMC were introduced during the first and second weeks to familiarize the students with the tools. In the following weeks, the focus shifted to the language.

Secondly, students needed more movement and hands-on activities in class. At first, the researcher expected that students would be excited to see several examples of students' project work video clips. However, it turned out that students seemed to be indifferent. They were more attentive in the hands-on activities such as making discussions online or interviewing a partner. In the main study, the class activities were focused more on lively language practice and allotted less time for lecture and video clips.

Lastly, it is essential to conduct an informal needs analysis before the instruction. The reason is that when integrating technology into the class, the teacher should consider the 'digital divide' (Warschauer, 2010). The researcher found that students in class had different levels of computer skills. Some were professional, while others were novices. A needs analysis was performed to inform the teacher the background of each student in order to provide appropriate support.

3.4.1.5. Redesigning DCP lessons

According to the findings of the first pilot study, the DCP lessons were redesigned as follows:

Firstly, two weeks were devoted to students' familiarization with the CMC tools. During these two weeks, the focus was not on the content knowledge so that students had sufficient time to explore the tools and would effectively be able to use them as a medium to communicate with their peers online. Secondly, the classroom activities were more interactive. The video watching time was reduced and the time for hands-on activities was increased. Finally, informal interviews were conducted with all students prior to the implementation of the DCP to identify students' technological backgrounds. The information obtained from the interview informed the teacher about the

level of students' technological knowledge so that the former could provide appropriate support.

To confirm the content and construct validity, the DCP manual was evaluated and commented on by three experts in terms of rationale, theoretical framework and components of the lesson plans (objectives, instructional activities, and assessment and evaluation). Evaluation forms with a three-point rating scale, 0 = rejected, 1 = not sure, and 2 = accepted, were provided for the three experts. Mean scores from the experts were calculated and the items which did not score between 1.50 and 2.00 were revised according to the experts' suggestions. The details are discussed as follows:

3.4.1.6. Validating the DCP

Three experts reviewed the instructional manual with regards to its rationale, theoretical framework, components, instructional activities and assessment and evaluation. In Table 3.11, the scores from each expert are presented.

Table 3.11 Experts' validation of the instructional manual and lesson plans

	Experts			
	A	**B**	**C**	**Mean**
Rationale	**1.0**	**1.0**	**1.0**	**1.0**
Theoretical Framework	**1.0**	**1.0**	**0.67**	**0.89**
Components	**0.7**	**0.8**	**0.3**	**0.6**
Instructional Activities (Lesson Plans)	**1.0**	**0.67**	**1.0**	**0.89**
Assessment and Evaluation	**1.0**	**1.0**	**1.0**	**1.0**

1.00-0.5 Accepted, 0.5-0 Revised

The mean scores in Table 3.11 show that all of the five items' mean scores were from 0.6 to 1.0 which indicates that the instructional manual was acceptable. However, the experts' comments and suggestions were taken into consideration for the improvement of the instructional manual and lesson plans.

Concerning the rationale of the study, all experts agreed that the background of the study was clearly identified, the rationale was logical and adequate information was provided. However, redundancy should be omitted.

Concerning the main components of the course which included goals and objectives, instructional processes, teacher's role, students' role, content, scope and sequence, the experts suggested the following: 1) the objectives of CMC should also be added to the scope and sequence so that readers could have a clearer view of the activities and assessment, 2) the instructional process should state clearly the modes of communication among students (face-to-face or online), 3) the roles of the teacher and students were briefly stated in the instructional manual; therefore, proper roles of the two parties should be clearly defined and, 4) the content was relevant to the theoretical framework; however, some content and objectives that did not correspond with each other needed to be revised. A sample of the instructional manual is shown in Appendix F.

Concerning the instructional activities, the experts suggested that the activities for introducing technology in the presentation stage should be more interactive and student-centered. Language and technology should be blended together, and CMC should be regarded as tools to enhance teaching and learning. Expert C further suggested that it should be stated in the instruction manual that the project work in this study was a 'half-controlled project work' as the project process had been assigned.

The mean scores from experts' validation and suggestions were used to improve the instructional manual and lesson plans. Following is the second pilot test of DCP lessons after the redesigning of the instructional activities based on the experts' suggestions.

3.4.1.7. Performing the pilot test of DCP lessons (2)

The objective of the second pilot study of the DCP lessons was to validate the construct of the redesigned DCP lessons. It was conducted by the researcher acting as a teacher in the second semester of academic year 2009. The three lessons pilot tested were 'Familiarize with CMC (1)', 'Familiarize with CMC (2)', and 'Let's brainstorm!'.

Familiarize with CMC (1)

This lesson was designed to familiarize the students with the use of the voice chats and to stimulate students' interest in 'Global Warming,' the project work topic. The task was to have students describe pictures of the scenes that were affected by global warming via voice chat. Each student received a voice chat manual to explore the tool. Then, they were divided into two groups. Each group got different sets of pictures. Students were to pair up with someone from the other group and discuss via voice chat to match the pictures and find out whether the pictures they got were taken before or after each other. A sample unit and lesson plan are shown in Appendix G and a sample material is shown in Appendix H.

Familiarize with CMC (2)

This lesson was primarily designed to familiarize the students with the use of audioblogs. Even though the task was to record speech via audioblogs which did not require the language form, appropriate pronunciation of the non-shared sounds and intonation in the lists were briefly introduced. Each student received an audioblog manual and a passage and was to hand in their recorded speech at the end of the lesson.

Let's brainstorm!

In this lesson, students were encouraged to discuss their plans for the project work via the audioblog and explore the video editing tool. Each student

received a manual for the video editing tool. Then they were to discuss with the group and to create a small group project.

Based on the suggestions from the experts and the findings from the previous pilot study, the instructional activities were redesigned to be more student-centered. Time spent on video watching and content introduced had been reduced. It was found that when receiving the voice chat, audioblog, and video editing tool manuals, students were more motivated to learn about the tools by themselves. They were encouraged to use the language to learn about the tools from their peers as well. Therefore, negotiation of meaning and collaboration among students were highly promoted.

After the second pilot study, the seven lessons were designed following the three revised lesson plans after the validation and were implemented in the main study.

3.4.2 Implementation of DCP

The DCP was implemented with nine English-major students from the Faculty of Education at a Thai public university in Thailand who enrolled in Speech Improvement as their elective course in June 2010. There is one section offered for this course every first semester.

The implementation of DCP took place in a language lab equipped with computer booths with headsets, microphones and Internet access. As the DCP integrated the use of technology, programs such as Yahoo Messenger, Microsoft Office PowerPoint and Windows Movie Maker were required to be installed on each computer. Fortunately, all computers had all the programs needed except the Yahoo Messenger. It had to be installed before the class started because the language lab security system allowed new programs to be installed only temporarily (on a one-time-use basis). The implementation of DCP lasted 12 weeks following the five main stages of project work: preparation, presentation, practice, assessment and follow-up.

The content covered was based on the course goals which aimed to help students enhance their English speaking proficiency while completing

project work and to stimulate students' communication strategies. Therefore, the content included linguistic knowledge concerning how to produce effective speech and communication, and technological knowledge about how to utilize CMC tools and programs for the development of project work.

The linguistic knowledge offered in this course focused on both form and function. It included English pronunciation to help students speak clearly and fluently with correct stress, rhythm and intonation, and overcome the problems of understanding and being understood by other speakers of English. It also provided useful English expressions needed for completing each task in the project work.

In addition, the content also covered knowledge of how to use synchronous and asynchronous CMC tools and the video editing tool or presentation tool to create the final project.

The implementation of DCP revolved around the project work process which required students to perform the tasks that led to the final project with the support of the content knowledge mentioned above.

The five stages of the implementation of DCP which included 1) administering the pre-test and distributing the Communication Strategy Inventory, 2) conducting the main study and collecting data, 3) administering the post-test, 4) distributing the Communication Strategy Inventory (2), and 5) conducting a semi-structured interview are elaborated upon as follows:

3.4.2.1 Administering the pre-test and distributing the Communication Strategy Inventory (1)

Week 1: The TOEIC Speaking Test was administered prior to the implementation of the DCP to examine students' readiness level (proficiency). Students' English speaking proficiency was rated by the instructor and an experienced tertiary-level English instructor based on the TOEIC Speaking Test rubric developed by ETS (2007). The criteria included pronunciation, intonation and stress, grammar, vocabulary, cohesion, relevance of content, and completeness of content. After receiving the results of the test, the teacher

(researcher) were informed of students' readiness levels so that she could provide appropriate support for individual students.

In addition, the Communication Strategy Inventory was also distributed to examine students' communication strategies before the intervention.

3.4.2.2.Conducting the main study and collecting data

During week 2 to week 11, the main study was conducted. The data from the voice chats were collected in week 3. The data from the audioblogs were collected in week 4. The classroom activities done each week are discussed as follows:

Week 2: Students performed informal interviews so that the instructor could learn about each student's interest and learning profile and provide support for each student accordingly. In order to help students successfully perform the task, the instructor introduced audioblogs and voice chats, useful expressions for 'responding to questions,' and pronunciation including intonation in wh-questions and yes-no questions. Figures 3.11 and 3.12 illustrate the voice chats used in the lesson.

Week 3: The project plan and criteria for the project work assessment were introduced. Students recorded their reflections on the project plan and assessment rubric via audioblogs. The instructor showed the students examples of project work made in the previous year, and then introduced the video editing program for the creation of the project. Useful expressions on how to 'express an opinion' were covered to help students successfully perform the task.

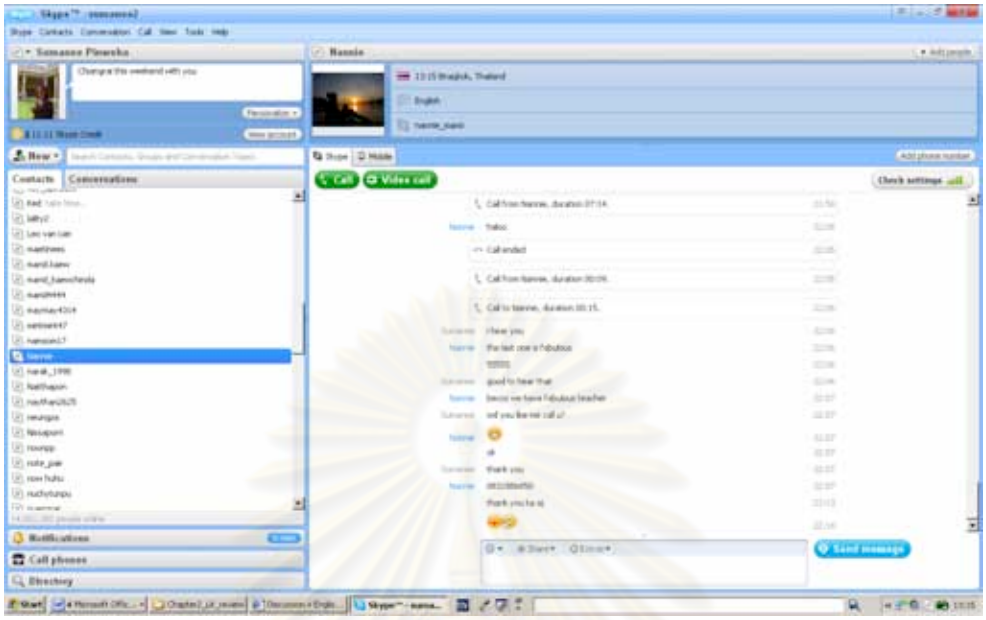


Figure 3.11 Voice chat (1)

Figure 3.12 Voice chat (2)

Week 4: The task was to perform a discussion of environmental problems with partners via voice chats. The objective of this task was to attract students' attention toward the project theme which was 'The Green Project.' In this preparation stage, students in each pair received different pictures of the

same place taken before and after the effects of global warming. Each student then had to explain to their partner what was in the pictures he or she had and record the discussion with a sound recording program installed on the computer in the lab. The content covered in this week was voice chat, useful expressions for ‘explaining something’ and ‘asking someone to repeat something’ and sentence stress. Figure 3.13 contains the sample pictures used in the lesson.

Figure 3.13 Before and after the global warming

Week 5: The main objective of the task for this week was to familiarize the students with the audioblogs. The task was to read a text aloud and record it on audioblogs. The content covered was prominence, thought groups, and non-shared sounds. Figure 3.14 illustrates the audioblog used in this study.

Figure 3.14 Audioblog

Week 6: In this week, a video editing program was introduced to students. Students worked in small groups creating a video clip by following the manual provided. This week was the presentation stage of project work during which students were exposed to technological knowledge required for the completion of their projects. Figure 3.15 shows a video editing tool presented.

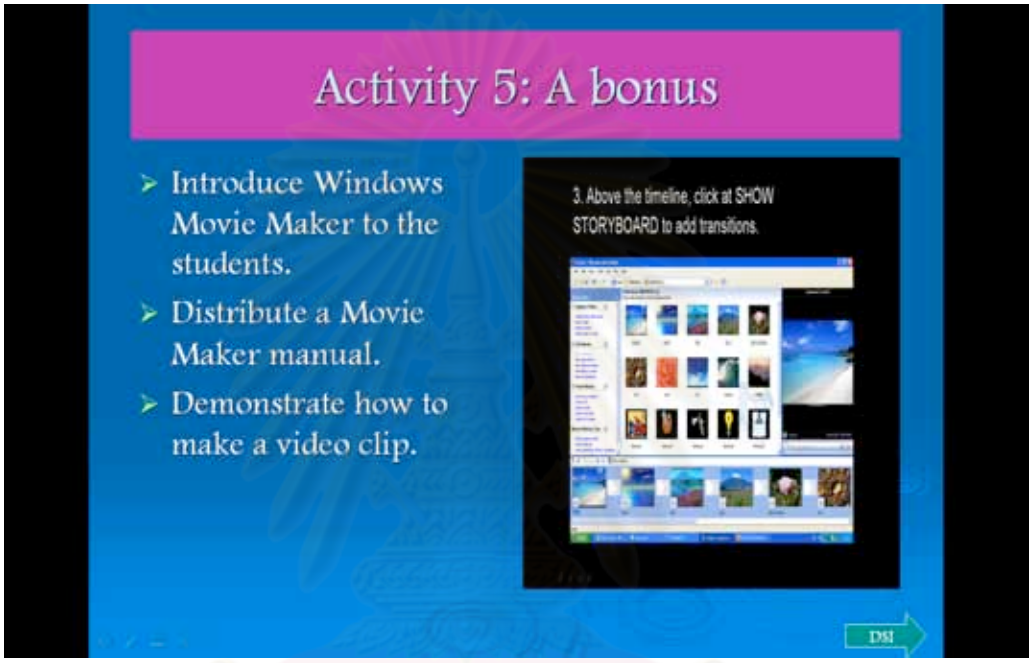


Figure 3.15 Video editing program

Week 7: The students performed a structured interview via voice chat as part of their data gathering for the project work. First, students would get a questionnaire consisting of ten yes/no questions. The students then were to search for more information about global warming from the Internet and add five more items. The content provided for students was useful expressions for 'interviewing someone' and rising intonation in yes/no questions. Figures 3.16 and 3.17 show examples of teaching materials used in the lesson.

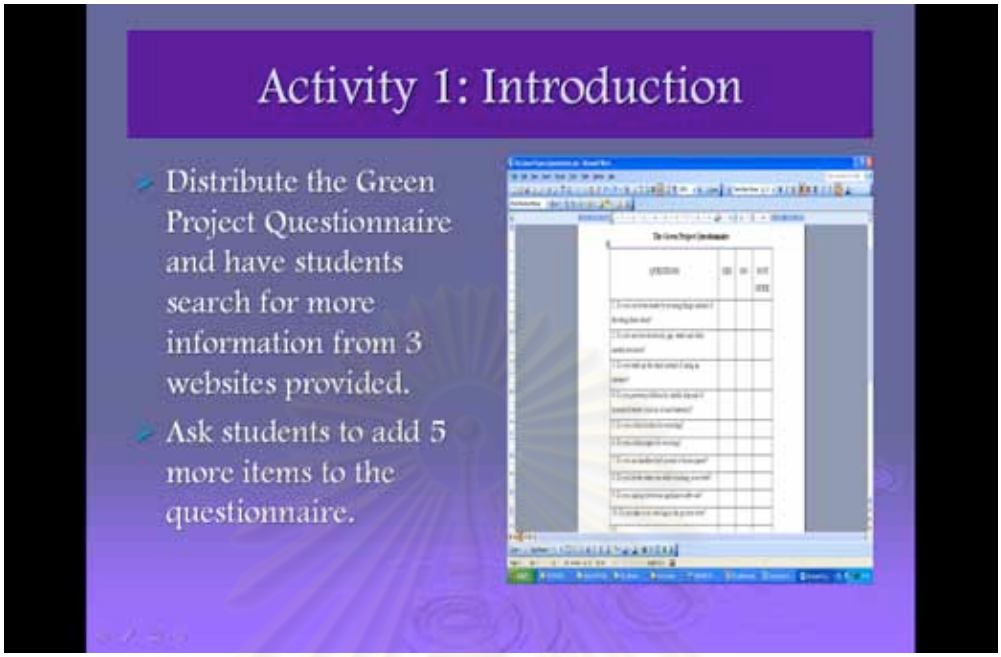


Figure 3.16 Example of teaching material (1)

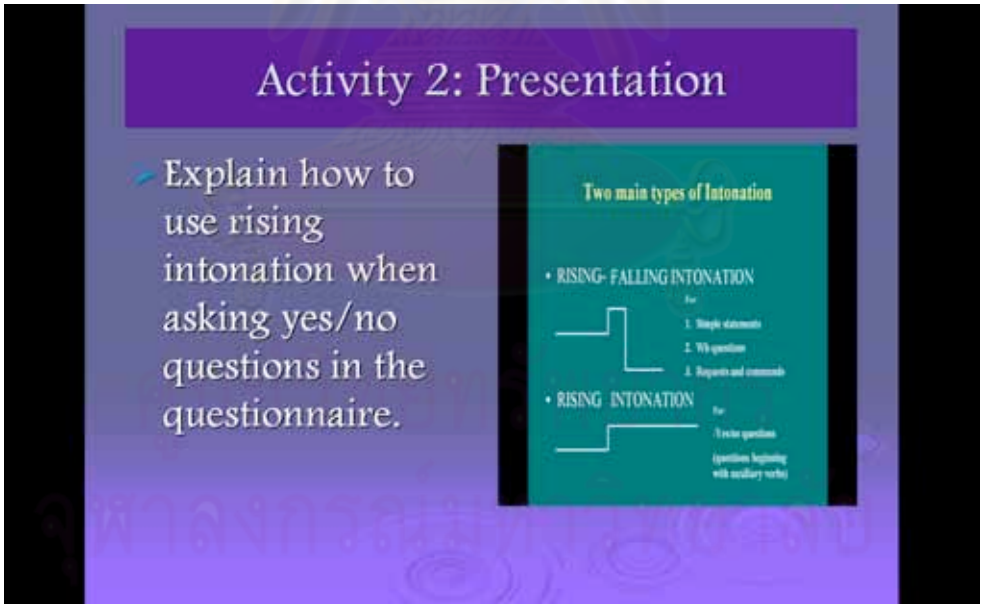


Figure 3.17 Example of teaching material (2)

Week 8: After the students got the data from the structured interview, they were to make a voice recording of ten proposed solutions concerning global warming via audioblogs. The content covered was useful expressions for 'reporting data,' prominence and thought groups.

Week 9: During this week, students presented their first drafts of project work which included their speech and video clips. Each student evaluated their own and their friends' work based the Project Work Assessment Rubric.

Week 10: This week was the follow-up stage of project work in which the instructor wrapped up the course with language focus (primarily on students' errors) and content knowledge presented to the students over the entire course. A summary of the classroom activities mentioned earlier is shown in Table 3.12.

Week 11: There was a teacher-student conference during which each student individually consulted with the instructor about their project work progress and storyboard writing. At this stage, the instructor had an opportunity to monitor each student's development and provide more support for those in need.

Table 3.12 Scope and sequence of DCP

Units	Wks	Lessons	Stages of Project Work	Objectives		Content (Presentation Stage of Project Work)			Assessment
				Project Work	CMC	CMC	Speaking	Pronunciation	
1 Orientation	1	**-Orientation (course introduction)** **-Students' self introduction** **-TOEIC Speaking pre-test**							
2 The Green Project	2	2.1 Getting to know you	**Preparation: Task1**: Informal interview on perceived speaking ability, technological background, interest and learning styles	-To identify students' motivation, goal and interest	- To promote comprehensible input	-Introduction of CMC Voice chats Audioblogs	-Responding to questions	- Intonation in Wh-questions and Yes-No questions	Recorded informal interview with a partner via voice chat

Units	Wks	Lessons	Stages of Project Work	Objectives		Content (Presentation Stage of Project Work)			Assessment
				Project Work	CMC	CMC	Speaking	Pronunciation	
2 The Green Project	3	2.2 Let's brainstorm!	**Preparation: Task 2:** Planning a project and setting criteria for project work assessment	-To have the students choose the sub-topic -To determine outcome	- To promote comprehensible input	- Audioblog	-Expressing an opinion	-Intonation	Recorded reflection on the project plan and assessment rubric via audioblog
	4	2.3 Familiarize with CMC (1)	**Preparation: Task 3:** Describing pictures (Before and after the melt-down)	-To stimulate students' interest in the project (Weeks 4 & 5)	- To promote comprehensible input	- Voice chat	- Explaining something - Asking someone to repeat something	-Sentence stress	Voice recording of a discussion with a partner via voice chat on environmental problems. (Describing pictures Recorded)
	5	2.4 Familiarize with CMC (2)	**Preparation: Task 4:** Reading a text aloud			- Audioblog		- Prominence and thought groups - Non-shared sound	Text reading via audioblog

	Wks	Lessons	Stages of Project Work	Objectives		Content (Presentation Stage of Project Work)			Assessment
				Project Work	CMC	CMC	Speaking	Pronunciation	
	6	2.5 Creating a video clip	**Practice: Task1:** Creating a video clip						A mini video clip
	7	2.6 Hunt for information	**Practice: Task2:** Conducting a survey and interview • Online information search	- To identify tasks. - To perform the tasks (Week 6-8).	- To promote students' negotiation of meaning	- Voice chat	- Interviewing someone	-Rising intonation (Yes/no questions)	Voice recording of a structured interview via voice chat
	8	2.7 The result	**Practice: Task3:** Analyzing data and report		- To promote students' negotiation of meaning	- Audioblog	- Reporting data - Propose a solution	- Intonation in lists	Voice recording of 10 proposed solutions via audioblog

	Wks	Lessons	Stages of Project Work	Objectives		Content (Presentation Stage of Project Work)			Assessment
				Project Work	CMC	CMC	Speaking	Pronunciation	
	9	2.8 Ready to perform?	**Assessment:** Performing an oral presentation	- To present the final projects - To perform self-assessment and peer-assessment	- To promote students' collaboration	- Audioblog	- Giving comments		Multimedia final product - Comments on peers' works via audioblog
	10	2.9 Follow-up	**Follow-up:** Wrap-up	- To provide follow-up for language and technological needs	- To scaffold students' learning	-Audioblog - Voice chat - Video editing tool	- Explaining something - Asking someone to repeat something - Expressing opinions - Interviewing someone - Reporting data - Proposing a solution - Giving comments	- Intonation in Wh-questions and Yes-No questions - Prominence and thought groups - Non-shared sounds - Rising intonation - Sentence stress - Intonation in lists	T's comments via audioblog

	Wks	Lessons	Stages of Project Work						
	11	Teacher-Students Conference	Project Work Revision						
	12	**TOEIC Speaking Post-test Semi-Structured Interview**							
	15	**Communication Strategy Inventory**							

3.4.2.3. Administering the post-test

The same form of TOEIC Speaking Test was administered as the post-test in week 12.

3.4.2.4. Distributing the Communication Strategy Inventory

The Communication Strategy Inventory was distributed to all students for the second time to identify their communication strategies after participating in DCP in week 12.

3.4.2.5. Conducting Semi-Structured Interviews

Semi-structured interviews were conducted three weeks after the end of the implementation of DCP. All students reflected on the benefits and drawbacks of DCP.

3.5 The Pilot Studies

Three pilot studies were conducted in this study. The details of each pilot study are discussed as follows:

3.5.1. The Pilot Study I

The first pilot study was carried out for three weeks in July 2009 with 17 Thai undergraduate English-major students. The objectives of this pilot study were to conduct a needs analysis on students' topics of interest, validate the three DCP lessons, test the practicality of the CMC tools, elicit students' communication strategies via CMC tools, and validate the interview questions. The instruments that were pilot tested were the three lesson plans, students' voice chats, students' audioblogs, and the interview questions. The findings based on the objectives of this pilot study are discussed as follows:

The findings

The findings of the first pilot study concerning 1) students' topics of interest, 2) validation and the redesigning of the DCP lessons, 3) the practicality

of the CMC tools, 4) students' communication strategies via CMC tools, and 5) validation of the interview questions are discussed as follows:

1. Students' topics of interest

Based on the frameworks of differentiated instruction and project work, the theme of the final project should derive from students' interests. To investigate students' topics of interest, a needs analysis for topic selection was conducted with 17 Thai undergraduate students. Students were to choose three favorite topics from the list adopted from Chan (2001, cited in Siritararatn, 2007). The choices made by the students were tallied by the researcher and the three most frequently chosen topics were reported.

The findings revealed that the three topics of interest that were the most frequently chosen were food, travel and the environment. However, 'Global Warming' was collaboratively chosen as the theme of the final project. This was because all students agreed that this theme allowed them to choose different sub-topics, such as travel, food, or fashion which they were interested in.

'Global Warming' was then the theme of the project work in the second pilot study and in the main study.

2. Validation and redesign of the DCP lessons

To validate the construct of the three DCP lessons, the lessons were pilot tested for three consecutive weeks in June 2009 with 17 English-major students. The three lessons were 'Let's brainstorm!,' 'Hunt for information,' and 'Ready to perform?'. The main goals for 'Let's brainstorm!' were to familiarize the students with a synchronous voice chat and to introduce them to useful expressions (such as agreeing and disagreeing, giving an opinion, asking for the opinion of others, asking someone to repeat something) and pronunciation (sentence stress) needed for completing the weekly project work assignment. The goal of 'Hunt for information' was to equip the students with language and skills needed for data gathering via an online interview and online information search. Similar to the first lesson, useful expressions (e.g. interviewing

someone) and pronunciation (rising intonation in yes/no questions) needed for completing the task were introduced. Lastly, the goal of 'Ready to perform?' was to introduce an audioblog, an asynchronous CMC tool, and the pronunciation needed for performing effective speech (prominence, thought groups and intonation) to the students. After the pilot study of the three lessons, the researcher found several aspects to be reconsidered.

Firstly, it was revealed that there was too much content and language focus to be covered each week. According to Warschauer (1996), 'dual immersion' should be performed when implementing computer technology in a language classroom. The foci on CMC and language should be balanced.

Secondly, it was found that viewing too many video clips bored the students. More hands-on activities should be added.

Lastly, the teacher should perform a needs analysis in order to clarify students' different levels of technological background. This information would allow the teacher to provide proper support for the students.

According to the findings of the first pilot study, the DCP lessons were redesigned as follows:

Firstly, during the first week, students were exposed to the CMC tools. The focus was not the content knowledge but the students' familiarization with the tools.

Secondly, the time for video watching was reduced and the hands-on activities were increased.

Finally, to explore the students' technological background, the teacher performed the informal interviews prior to the DCP intervention.

3. Practicality of the CMC tools

The CMC tools used in this study were voice chats and audioblogs. When dealing with technology, the teacher should be concerned with the practicality of the tools to avoid unforeseen problems. During this pilot study, the voice chats and the audioblogs were used as a means of communication between the teacher and the student or the student and the student. The issues

considered when using these tools were the program installation, quality of the microphones, headsets, and sound recording program.

The findings of the pilot study concerning the practicality of the CMC tools revealed that the program for voice chat needed to be installed prior to every class because the security system at the lab only allowed a new program to be installed temporarily. However, the audioblogs did not need any programs to be installed before use. In addition, the findings concerning the quality of microphones, headsets, and sound recording program provided at the lab showed that these tools were of high quality. There were no problems hearing the sounds after recording. Therefore, the computer lab was ready for implementing these CMC tools.

4. Eliciting students' communication strategies via CMC tools

The voice chats and audioblogs were used as tools to elicit students' communication strategies. The data obtained from these tools were used to develop the Communication Strategy Inventory (CSI). However, the coding categories for the transcripts of students' voice chats and audioblogs in the main study were drawn from the findings of conversation analysis. The tasks in DCP used to elicit students' communication strategies for the development of the CSI were to brainstorm environmental problems via the voice chat and to read the text aloud via the audioblog.

The findings from an analysis of voice chats revealed that the four main categories of communication strategies found in the first pilot study were *1) avoidance or reduction strategies, 2) achievement or compensatory strategies, 3) stalling or time-gaining strategies, and 4) interactional strategies.* The findings also reported that interactional strategies were the most frequently used by the students. Achievement or compensatory strategies, avoidance or reduction strategies, and stalling or time-gaining strategies were respectively less preferable. These categories of communication strategies from the first pilot study were used to develop the items in the Communication Strategy Inventory.

Besides the voice chats, audioblogs were also used to elicit students' communication strategies. However, there were no communication strategies revealed in the audioblogs because the task was to 'read a text aloud' which did not promote negotiation of meaning. Therefore, the task using audioblogs to elicit students' communication strategies via CMC tools in the second pilot study were changed to 'Reflecting on the Project Work Assessment Rubric' and 'planning a project' which would promote more communication strategy use.

5. Validation of the interview questions

In the first pilot study, the interview was administered by having all students record their responses to three questions adopted from Dudeney & Hockly (2007, p. 57) using a voice recording program at the language lab and emailing their voice files in the MP3 format to the instructor. The researcher found that the interview in the pilot study was conducted in a structured manner that did not allow the researcher to gather in-depth information.

Therefore, in the main study, the interview was performed in a less structured manner. All students were individually interviewed. To encourage true reflections of students on the DCP, the interviews were conducted three weeks after the end of the implementation of the study when the students' grades on the final projects were reported. The interviews were audio recorded and digitally saved in the MP3 file format.

3.5.2. The Pilot Study II

The second pilot study aimed to measure the reliability of the Communication Strategy Inventory. It was conducted with 43 English-major undergraduate students who were representative of the population but were not participants of the main study. The Cronbach's alpha coefficient reliability value of Communication Strategy Inventory was 0.72, indicating that the questionnaire was reliable and appropriate for the study.

3.5.3. The Pilot Study III

The third pilot study was carried out for three hours in the second semester of academic year 2009 with seven students who were separate from the sample group of the study but with the same demographic characteristics. After the validation by experts, the instruments that were pilot-tested included the three lesson plans, and a semi-structured interview. The findings showed positive effects. Therefore, the lesson plans and the semi-structured interview were implemented in the main study without further revision.

3.6. Data Collection

The DCP was implemented for 12 weeks. The data collection consisting of three phases: before, during, and after the treatment is discussed below.

3.6.1. Before the implementation

Week 1: The DCP was introduced to the Thai undergraduate students. The TOEIC Speaking Test was administered as a pre-test to measure the students' English speaking proficiency and the Communication Strategy Inventory was distributed to identify students' communication strategies before the DCP.

3.6.2. During the implementation

Week 2: An informal interview to elicit students' backgrounds was performed. Students were exposed to CMC tools: audioblog and voice chat for the first time. Due to time constraints, audioblog and voice chat IDs and passwords were prepared. Students were anonymous to one another because their real names were not revealed. They then interviewed a partner via voice chat and recorded it in an MP3 file format. The data gained from both the TOEIC Speaking Test and informal interview informed the instructor of each student's readiness level (proficiency), interest, and learning profile so that the instructor could closely monitor students who needed more support and provide proper guidance.

Week 3: Students were to express their ideas about the project plan and reflect their opinions on the Project Work Assessment Rubric via audioblog. Even though the audioblogs allowed users to make sound recordings and upload them to the website, users' sound files could not be downloaded and saved. The sound recording program provided by the language lab was simultaneously used to record students' performance on audioblogs. Students' audioblogs were collected for an analysis of students' communication strategies.

Week 4: The data from students' voice chats were collected as the students performed an online discussion with a partner via voice chat. One aim of this activity was to identify students' communication strategies when negotiating meaning. Each pair of students received different sets of pictures illustrating either before or after global warming. They were to explain what the picture they got on the exercise sheets looked like. The discussions via voice chat were recorded by a sound recording program provided in the language lab.

Week 5: The audioblog was re-introduced to the students to familiarize them with the tool. The task was to read the text aloud.

Weeks 6-8: During these weeks, students created mini video clips, conducted a survey and interview, analyzed data and reported the findings, and wrote a storyboard for the final product. At this stage, students were provided with knowledge and skills needed for completing their final projects.

Week 9: Students presented their final projects to the class. Their work was assessed by the students themselves, their peers, and the instructor.

Week 10: The teacher wrapped up the course with the language derived from students' errors during the DCP intervention.

Week 11: The teacher had a conference with each student regarding the project work. Students revised their work accordingly and resubmitted their final projects.

3.6.3. After implementation

Week 12: The data from the TOEIC Speaking Test and the Communication Strategy Inventory were collected.

The same form of the TOEIC Speaking Test was administered to compare students' English speaking proficiency before and after the implementation of DCP.

The Communication Strategy Inventory was distributed to all students for them to reflect on their perceived use of communication strategies.

Week 15: The semi-structured interview was conducted after the grades for the project work had been reported so that students were more comfortable to reveal their true opinions toward the DCP. The interviews of each student lasted about 15 minutes and were audio-recorded.

A summary of the three phases of data collection is shown in Table 3.13.

Table 3.13 Data Collection

Before implementation
Week 1 • DCP and CMC were introduced. • The TOEIC Speaking Pre-test was administered to identify readiness level. • The Communication Strategy Inventory was distributed.
During implementation
Week 2 • Students performed informal interviews to elicit backgrounds, interests and learning profiles. • Voice chats and audioblogs were introduced to the students. Week 3 • Students' audioblogs were collected. Week 4 • Students' voice chats were collected.

Weeks 5-8 • Students performed the activities in the practice stage of project work.
Week 9 • Final projects were presented and assessed based on the Project Work Assessment Rubric by students themselves, their peers, and the instructor.
Weeks 10-11 • The content knowledge, language focus and skills learned from the course were reviewed. Each student had a conference with the instructor.
After implementation
Week 12 • The TOEIC Speaking Post-test was administered. • The Communication Strategy Inventory was distributed.
Week 15 • The semi-structured interview was conducted.

3.7 Data Analysis

The quantitative data were analyzed by a computer program in terms of descriptive statistics (means and standard deviation), relationship, and reliability using the following statistics: the Wilcoxon Matched-Paired Signed Ranks Test, the Spearman Rank Correlation Coefficient, and the Cronbach's Alpha Internal Consistency. The qualitative data were then transcribed, coded, and categorized by the researcher and another experienced tertiary-level English instructor. The details of the data analysis according to each research question are illustrated in Table 3.1.

Research Question 1:

To what extent does Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work (DCP) improve Thai undergraduate students' English speaking proficiency?

Answers to Research Question 1 came from the TOEIC Speaking Test which was used as the pre-test and post-test. The TOEIC Speaking Pre-Test was administered in the first week before the implementation of DCP. The same form of the TOEIC Speaking Test was used as the post-test in the final week after the implementation. The data gained from this instrument were scored by two raters using the TOEIC Speaking Test rubric generated by ETS (Educational Testing Service). Scores from the pre-tests and post-tests were used to examine effects of the DCP on students' English speaking proficiency. They were compared using the Wilcoxon Matched-Paired Signed Ranks Test, a nonparametric statistic for related samples (Siegel, 1956).

In addition, the effect size of these two mean scores was also calibrated by using Cohen's *d*.

Research Question 2:

What communication strategies do Thai undergraduate students use while participating in DCP?

Three research instruments--students' voice chats, students' audioblogs, and the Communication Strategy Inventory—were used to find answers for Research Question 3.

Students' audioblogs in week 3 and students' voice chats in week 4 were transcribed by the researcher based on transcription conventions of Markee and Kasper (2004), Silverman (2006), and MICASE (2002) for conversation analysis. The results from conversation analysis revealed categories of communication strategies for coding. These communication

strategies were categorized by the researcher and an experienced tertiary-level English instructor using a card sorting technique (Nunan & Bailey, 2009).

The major categories of communication strategies that had emerged from students' audioblog transcripts included *strategies for compensating for the unknown words* (compensatory strategies), *strategies used for gaining more time* (time-gaining strategies), *strategies for emphasizing* (emphasis), and *strategies used for unsuccessful execution* (avoidance strategies). For the voice chat, all of the above strategies existed including interactional strategies which were divided into two roles of the user: *a speaker* and *an interlocutor*. The speaker was the one who initiated the talk while the interlocutor was the one who responded. The definitions and categories of communication strategies that emerged from students' transcriptions of voice chats and audioblogs are shown in Appendix C.

Transcripts of students' audioblogs and voice chats were coded based on the aforementioned communication strategy categories by the researcher and an experienced tertiary-level English instructor whose inter-rater reliability was at the level of 0.93. Frequencies of coding the communication strategies from both raters were compared. Discrepancies were discussed for consensual agreement.

The Communication Strategy Inventory (CSI) adopted the framework of Cohen and Dörnyei (2002) consisting of four classifications of communication strategies, namely, *avoidance or reduction strategies, achievement or compensatory strategies, stalling or time-gaining strategies,* and *interactional strategies*. The inventory was analyzed for the mean scores. Items whose scores were between 1.00 and 2.00 were classified as infrequent, 2.01 and 3.00 as moderate, and 3.01 and 4.00 as frequent.

The results obtained from the qualitative approach and the CSI were triangulated.

Research Question 3:

Is there any significant difference between Thai undergraduate students' perceived use of communication strategies before and after participating in DCP?

The Communication Strategy Inventory (CSI) was used as a research instrument to answer the Research Question 4. The CSI was distributed to the students in the first week and the final week of the implementation of the main study. The data gained from this instrument were analyzed by means of descriptive statistics that were compared using the Wilcoxon Matched-Paired Signed Ranks Test to find the difference between students' communication strategies before and after the implementation of DCP.

Research Question 4:

What are Thai undergraduate students' opinions on DCP?

The semi-structured interview was used as a research instrument to answer Research Question 5. The interview consisted of eight questions eliciting attitudes towards benefits and drawbacks of the DCP, and one question for eliciting students' suggestions on how to improve the course.

The interview was administered and audio-recorded three weeks after the end of the implementation of the main study (after the grades for project work had been reported) so that it would be more likely for the students to give accurate and truthful responses. The data were transcribed and categorized by the researcher.

3.8. Chapter summary

This study is a mixed-method study aiming to examine the students' English speaking proficiency and communication strategies adopting the one-group pretest-posttest quasi-experimental design. Instructional instruments and research instruments were developed and validated by experts. Pilot studies

were carried out to verify the practicality of the instructional treatments and the validity of research instruments.

During the ten-week implementation of the main study, students performed weekly tasks that provided data on students' use of communication strategies via CMC. After the treatments, TOEIC Speaking post-test scores were compared to the pre-test scores to examine the students' English speaking proficiency. The scores from the Communication Strategy Inventory administered before and after the treatment were also compared to study the change in the students' perceived use of communication strategy. The semi-structured interview was administered three weeks after the intervention to elicit the students' opinions about the DCP. The next chapter reports the results of this study according to four research questions.

CHAPTER IV
RESULTS

This chapter presents the findings of data collected from the TOEIC Speaking Tests, the Communication Strategy Inventory, audioblogs, voice chats, and semi-structured interviews. The findings are examined in relation to four research questions:

1. To what extent does Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work (DCP) improve Thai undergraduate students' English speaking proficiency?
2. What communication strategies do Thai undergraduate students use while participating in DCP?
3. Is there any significant difference between Thai undergraduate students' perceived use of communication strategies before and after participating in DCP?
4. What are Thai undergraduate students' opinions about DCP?

Research Question 1 focused on the improvement of English speaking test scores after the intervention, and the mean scores of TOEIC Speaking pre-test and post-tests were compared. Research Question 2 explored the students' communication strategies while participating in the DCP online activities. Mean scores from the Communication Strategy Inventory were examined and the findings were triangulated with the analyses of students' audioblogs and voice chats. Research Question 3 aimed to compare the students' perceived use of communication strategies before and after the intervention. The mean scores of the Communication Strategy Inventory taken before and after the intervention were then examined. Research Question 4 explored students' opinions about the

intervention and students' responses from the semi-structured interviews were categorized.

4.1. Results of Research Question 1

Research question 1 *- To what extent does Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work (DCP) improve Thai undergraduate students' English speaking proficiency?*

This research question explored the effects of DCP on English speaking proficiency by examining the TOEIC Speaking pre-test and post-test mean scores. Due to the small sample size, the scores were not normally distributed. The Wilcoxon Matched-Paired Signed Ranks Test was used to compare both test scores. Hypothesis one guides the comparison of TOEIC Speaking pre-test and post-test scores.

> ***Hypothesis 1:*** *Thai undergraduate students' English speaking post-test mean scores will be significantly higher than their English speaking pre-test mean scores after participating in the Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work. ($p < .05$)*

Table 4.1 Findings of TOEIC Speaking pre-test and post-test scores of Thai undergraduate students participating in DCP

	n	***Mean***	***SD***	***Z***	**Sig.**	**Mean difference**	***d***
Pre-test	9	47.91	4.35	2.67	.00*	28.67	.63
Post-test	9	76.58	2.31				

P*<.05

The findings in Table 4.1 indicate that the students participating in DCP made a significant improvement ($Z = 2.67$, $p < 0.05$) on their TOEIC Speaking pre-tests and post-tests after ten weeks of the intervention. This improvement is shown in an increase of the post-test mean scores of 28.67 points. The effect size calculated by Cohen's *d* suggests that the improvement was large (see Field, 2009). Therefore, Research Hypothesis 1 was supported.

Table 4.2 Criteria of TOEIC Speaking pre-test and post-test scores

Criteria	n	Mean	SD	*Z*	Sig.	Mean Difference
Pro1	9	44.37	7.10	2.67	0.008*	26.27
Pro2	9	70.64	1.96			
Into1	9	50.58	5.10	2.67	0.008*	29.07
Into2	9	79.65	5.80			
Struc1	9	44.07	8.73	2.67	0.008*	24.15
Struc2	9	68.22	4.72			
Vocab1	9	41.55	6.45	2.67	0.008*	33.09
Vocab2	9	74.64	4.70			
Cohe1	9	47.10	4.85	2.67	0.008*	31.97

Cohe2	9	79.07	3.68			
Relev1	9	52.95	4.15	2.67	0.008*	31.47
Relev2	9	84.42	5.19			
Comple1	9	58.89	2.70	2.67	0.008*	20.59
Comple2	9	79.48	6.48			

P* < 0.05

Table 4.2 presents students' TOEIC pre-test and post-test mean scores according to the seven criteria proposed by TOEIC Speaking Assessment Rubrics (ETS, 2007). They are (1) pronunciation, (2) intonation and stress, (3) structure, (4) vocabulary, (5) cohesion, (6) relevance of content, and (7) completeness of content. The findings show that students had significantly improved in all criteria after the intervention. Students' scores on vocabulary, cohesion, relevance of content, and intonation gained the highest mean differences (33.09, 31.97, 31.47, and 29.07, respectively). However, their scores on the structure improved the least (24.15).

4.2. Results of Research Question 2

Research question 2 *- What communication strategies do Thai undergraduate students use while participating in DCP?*

Research Question 2 explored communication strategies that Thai undergraduate students used while participating in the DCP. Quantitative findings from the Communication Strategy Inventory and qualitative findings from analyses of audioblogs and voice chats are discussed as follows:

4.2.1. Quantitative findings

Students' mean scores of the Communication Strategy Inventory (CSI) after the treatment were calculated. It was found that use of all-purpose words (3.67), approximation (3.45), and circumlocution (3.44) were perceived by the students as the most frequently used communication strategies. On the other hand, foreignizing (1.67), word-coinage (1.78), and use of non-linguistic means (2.00) were least frequently used. Based on each major category, message abandonment was the most frequently used in the avoidance or reduction strategies. Use of all-purpose words was the most frequently used in the achievement or compensatory strategies. Fillers and hesitation devices was the most frequently used in the stalling or time-gaining strategies. Asking for repetition was the most frequently used in the interactional strategies. The mean scores of the Communication Strategy Inventory are displayed in Table 4.3.

Table 4.3 Findings of Communication Strategy Inventory (CSI)

Categories of CS (Cohen & Dornyei, 2002)		**Mean**	**SD**
Avoidance or reduction strategies	Message abandonment	2.56	.75
	Topic avoidance	2.48	.61
	Message replacement	2.17	.52
Achievement or compensatory strategies	Approximation	3.45	.63
	Circumlocution	3.44	.73
	Use of all-purpose words	**3.67**	**.61**
	Word-coinage	1.78	.67

	Use of non-linguistic means	2.000	.67
	Literal translation	2.33	.50
	Foreignizing	**1.67**	**.71**
	Code switching	2.78	.53
Stalling or time-gaining strategies	Use of fillers and hesitation devices	2.78	.70
	Repetition	2.56	.73
Interactional strategies	Appeal for help	3.22	.72
	Asking for repetition	3.39	.70
	Asking for clarification	3.22	.67
	Asking for confirmation	2.89	.93
	Expressing non-understanding	3.33	.61
	Interpretative summary	3.11	.78

To triangulate the data and explore students' patterns of communication strategy use, students' audioblogs and voice chats were transcribed based on transcription conventions of Markee and Kasper (2004), Silverman (2006), and MICASE (2002) for conversation analysis.

It was found that topic avoidance, word-coinage, use of non-linguistic means, literal translation, foreignizing, asking for repetition, and expressing non-understanding, strategies which were included in the Communication Strategy Inventory, did not exist in the data obtained from audioblogs and voice chats. On the other hand, as a result of conversation analysis, sound lengthening, long

pauses, high volume, minor pauses, spelling, backchanneling, echoing backchanneling, and guessing emerged from the two tools and were added to the communication strategy category for an analysis (frequency count). It was also found that communication strategies that were used in voice chats but not in audioblogs were comprehension check, appeal for help, spelling, backchannel, echoic backchannel, clarification, confirmation check, guessing, and interpretive summary. Strategies from audioblogs and voice chats could be categorized into five major categories: avoidance, compensatory, time-gaining, emphasis, and interactional strategies. The frequencies of each category are shown below.

Table 4.4 Findings from transcripts of audioblogs and voice chats

	Strategies	**Audioblogs (n=9)**	**Voice chats (n =9)**
		Frequency	
Speakers	**Avoidance**		
	Message abandonment	5	16
	Message replacement (self-correction)	**54**	**63**
	Compensatory		
	Circumlocution	0	7
	Approximation	2	0
	All-purpose words	**24**	**8**
	Use of L1	0	6

Time-gaining		
Fillers	256	373
Sound-lengthening	**375**	**515**
Long pauses	86	159
Repetitions	105	263
Emphasis		
High volume/ stress	5	27
Minor pauses	**753**	**664**
Interactional strategies		
Show/check understanding		
- Comprehension check	0	19
Ask for/ offer help		
- Appeal for help	0	6
- Spelling	0	2

Interlocutors	Show/ check understanding		
	- Backchannel	0	**136**
	- Echoic backchannel	0	11
	- Clarification request	0	10
	- Confirmation check	0	42
	Ask for/offer help		
	- Guessing	0	5
	- Interpretive summary	0	31

Table 4.4 shows frequencies of communication strategies used in audioblogs and voice chats. It was found that minor pauses, sound-lengthening, and fillers were most frequently used. Based on each category: message replacement was most frequently used in the avoidance category, all-purpose words were most frequently used in the compensatory category, sound-lengthening was most frequently used in the time-gaining category, minor pauses were most frequently used in the emphasis category, and comprehension check was most frequently used in the interactional category. One interesting finding is that for each category, the were most frequently used strategies for audioblogs, namely, all-purpose words, sound lengthening, minor pauses, and message replacement, were also the most frequently used in voice chats.

For triangulation, the findings from the CSI and the analyses of audioblogs and voice chats were compared. It was found that the results of transcripts of audioblogs and voice chats supported the results of the CSI in that all-purpose words were the most frequently used compensatory strategy. However, the findings were different in other categories. From the CSI, message abandonment

was most frequent used while analyses of audioblogs and voice chats reported message replacement. In the time-gaining category, fillers were most frequently used according to the CSI while sound lengthening was found to be the most frequently used in analyses of audioblogs and voice chats. For the interactional category, asking for repetition was reported to be most frequently used in the CSI while analyses of audioblogs and voice chats revealed an extensive use of backchannel. The emphasis strategies including use of high volume/stress and minor pauses which emerged from the audioblogs and voice chats did not exist in the CSI. Therefore the findings of the emphasis category were not compared.

4.2.2. Qualitative findings

In addition to frequency, the patterns of communication strategies used via CMC were also revealed. These patterns included (1) multiple strategies for one target, (2) functions of fillers, (3) functions of sound lengthening, (4) functions of minor pauses, (5) functions of longer pauses, (6) functions of repetitions, (7) forms of message abandonment, and (8) evidence of negotiated interaction.

4.2.2.1. Multiple strategies for one target

When students had problems finding the right words, they tried to use multiple strategies to compensate for their linguistic deficit by using approximation, circumlocution, all purpose words, use of L1, and non-linguistic means.

Via voice chat, students were to describe the pictures of four locations taken before and after the global warming and to match them with their partners'. The most troublesome pictures are shown below.

Figure 4.1 Before or after. ***Photos courtesy of www.telegraph.co.uk***

In order to describe 'a pile of spiky-shaped rocks,' students used a wide range of communication strategies to get their message across. Below is an excerpt from VO2 and VO6's voice chat transcripts.

VO6: And there is like there is like a rock (.) a rock **[approximation]** not not the mountain. [The rock

VO2: [the valley

VO6: no no no not valley um::: (.) the::: rock (.) the high rock like (.) Stonehen <sic> **[circumlocution]** you know=

VO2: =but I I think it's about a grand canyon?=

VO6:= Ya. Something like that.

VO2: something the same or similar to right?

VO6: Ya ya. but this like Stonehen <sic> and the guy uh: stands there (.) and (.) there is the *lam* ((sharp)) **[use of L1]** How to say? **[appeal for help]** <SS: LAUGH> the high rock with the um::: like (.) how to say it? **[appeal for help]** ya. And covered by all all around him is the (.) snow **[message replacement]**.

VO6 got the picture on the left, trying her best to convey the message 'a pile of spiky-shaped rocks.' She started by using approximations to provide her

interlocutor a general idea of what her picture looked like. Then, she used circumlocution to help her interlocutor relate what on the picture to his or her background. Next, she used her native language to describe the characteristics of the rock, and used appeal for help to indicate her incapability to finish the statement. Her final strategies were to abandon the previous message and replace it with a different focus.

Via audioblogs, students also used communication strategies extensively. They were assigned to brainstorm the project theme and reflect on a project work assessment rubric. Below is an excerpt from AU5's audioblog transcript.

> "And also they (students) have to concern about the grammar (.) the grammar usage **[message replacement]** because u::m this part is also important as (.) you::re (.) they will look **[message replacement]** (.) will look **[repetition]**(.) u:::m better **[approximation]** if they use (.) if their language use **[message replacement]** (.) is very good. **[all-purpose word]"**

AU5 revealed in a retrospective interview that her intended message was "grammar usage should be entirely correct." However, it is apparent that she was unable to pick the right words to reflect her thought, resulting in three message replacements, one repetition, one approximation, and one all-purpose word.

4.2.2.2. Functions of fillers

It was found that students used fillers in audioblogs and voice chats for four functions: indicating a new topic/sentence, gaining more time, signaling self-correction, and ending an utterance.

1. Indicating new topic/sentence

In every audioblog transcript, the filler “Ok” was used to indicate a new topic and other fillers, such as ‘ah,’ ‘um,’ ‘uh’ were used to indicate a new sentence as shown in the excerpts below.

AU8:

> “*Ok*, I want to talk about the project work assessment rubric. From the criteria, a:::h I think that is cover enough in terms of u::::m (3.0) content, organization, attrativeness, and the synthetis (.) the synthesis of materials……..”
>
> “*Ok*. I will talk (.) about (.) the global warming project. .hhhh u:::m the issue or the topic that I will use to relate to uh global warming project (.) is about (.) food…….”

AU8 used “ok” at the beginning of his new topics. The first excerpt is about the project work assessment rubric. In the second excerpt, the topic shifted to the project theme of global warming.

AU9:

> “…for the au (.) audio-visual production, there a::re four things to consider for the assessment (.) those are content, organization, attractiveness, and synthesis of materials. hhhhhh *U::::m* (.) I think that (.) all the four are things to be considered (.) *a::h* are equally important. *A::h* the con (.) although, the content see (.) seems to be of the most (.) *u::h* important *u::m* (.) and there are three levels of grading, 3 points for exceptional, two points for admirable, and one point for amateur. *U::::m* (.) someone who

gets the exceptional level *u::h* their works (.) must be (.) excellent (.) must be outstanding."

AU9 used fillers, "ah" or "um" at the beginning of his sentences. This is also applicable to other students.

2. Gaining more time

Students also used fillers to gain more time to think of a word. Fillers used for time gaining typically appeared in the medial position of utterances, and frequently preceded an intended word or phrase.

AU6:

"Because they live in the north pole (.) and now the north pole is going to melt (.) by *a:::h* (.) higher temperature."

AU7:

"*U::h* but (.) *u:::h* the topic that *a::h* interest me *a::h* the most is about *a::h* behavior of the *u:::h* of (.) of (.) people o:::r *u:::h* the population in this society that (.) *u::h* will help *u::h* reduce *u::h* the greenhouse effect or the environment crisis."

AU6's audioblog transcript demonstrates a typical filler used for time gaining. It appears in the medial position of an utterance, prior to an intended word. However, AU7's audioblog transcripts reveal an excessive use of fillers which causes lack of fluency.

3. Signaling for self-correction

Students often used fillers before making self-correction. Since, fillers allow students to have more time to think about a word to be replaced, they, at the same time, signal their self-reflections as in an excerpt below.

AU2:

….for example, when they go t:::o (.) u:::h trekking (.) *u:::h* hiking (.) i::n the forest they will u:::m (1.0) they can (.) they will see (.) some of th:::e rare (.) plants or rare (.) trees……..

4. Ending an utterance

"Something like that" was used to end an utterance and used as a signal to give the floor to a counterpart.

VO2:

Yours is after because (.) um:::(1.0) the:: instructor said that before or after the melt-down (.) so:: in your picture if (.) it is ah:: (.) ah::: (.) before picture it (.) will be (.) covered with ice *something like that*.

4.2.2.3. Functions of sound lengthening

In this study, sound lengthening had three main functions: *making an emphasis, gaining more time, and dominating the floor.*

VO2: …..and the picture C there is the *hu::ma::n* **[emphasizing]** in *the:::* **[time-gaining]** (2.0) on *the:::* **[time-gaining]**(.) quite right of the picture (.) a:nd I can *see::* **[emphasizing]** what can we call the pillar (.) *ah:* **[time-gaining]**

the pillar of the ice? *o::r* **[time-gaining]**(2.0) *ah::***[time-gaining]** in line of the picture.

VO7: the fissure?

In an excerpt from the voice chat transcript, VO2 incorporated sound lengthening and stress to make an emphasis on the words “human” and “see,” while “the,” “and,” “or,” and “ah” were used to gain more time and indicate an intention to dominate the floor.

4.2.2.4. Functions of minor pauses

Minor pauses were used to make an emphasis, and to signalize message replacement or self-correction.

1. Making an emphasis

VO9:

> “a::h. The picture A, there is a::h icy mountain at the background of the picture. It is covered with the thick *(.)* **[emphasizing]** layer of ice.”

In this excerpt, VO9 made a minor pause after the word “thick” to make the word stand out.

2. Signaling message replacement or self-correction

In the following excerpt, VO9 and VO7 made several self-corrections by placing a minor pause between previous and corrected forms.

VO9: …..the ice layer is still sick *(.)* **[signaling message replacement]** thick

VO7: o:::k and my pic *(.)* **[signaling message replacement]** my picture number three is um:::ah::: it's about *(.)* **[signaling message replacement]** it's all of the:: *(.)* **[signaling message replacement]** it's all around the picture is about the mountain and in the middle of the mountain, it's covered with the ice.

4.2.2.5. Functions of long pauses

Two major functions of longer pauses are for gaining more time and making an emphasis.

1. Gaining more time

In this study, fluent speakers preferred using longer pauses for time gaining to fillers. In an excerpt below, AU4 used five longer pauses and no fillers.

AU4:

> But first of all, I have to tell you that I'm not a kind of environmental person but I DO concern about this topic. But for this project, I don't wanna make it sounds so boring like talking about the cause (.) the (.) pro and con the *(2.0)* effect of global warming to our world. Because I know that people know a lot about it. So I want to make it *(3.0)* more interesting by (.) suggesting the new idea of how people can help (.) can do something about this problem. And I think of *(1.0)* fashion. As a fashion girl, I like talking about fashion and heard a lot about it. Some certain texture of clothes that can help *(3.0)* the global warning (.) because of the manufacturing and *(2.0)* it's natural trade.

2. Making an emphasis

Longer pauses function like minor pauses by making a word stand out.

VO3:

There is the lakes under the mountains a::nd (.) it seems *(1.0)* dry. I don't know. The mountain (.) the front mountain see:ms dry and drought, (.) you know (.) drought.

. **4.2.2.6. Functions of repetition**

Two major functions of repetition are to make an emphasis, and to gain more time.

1. Making an emphasis

Repetition used for emphasis would be accompanied by minor pauses, stress, sound lengthening, or high volume as in an excerpt below; otherwise, it would be regarded as a time-gaining function.

VO6**:** *But but* **[time-gaining]** my B is only mountain and there's nothing to cover. Just the rocky mountain.

VO2: oh! It's *really really* **[emphasizing]** sad to hear that.

2. Gaining more time

Repetition would be regarded as time-gaining if it is not accompanied by minor pauses, stress, sound lengthening or high volume.

VO4: ok, my first picture, my first picture (.), a lot of (XX) on the ground, on the foreground. The land the land is <LAUGH> it's like *isan ban rao*. ((Northeastern part of Thailand)) <SS: LAUGH>

VO1: and and and there's a mountain covered with (.) with ice right?=

VO4: =Ye:::s, I can't see it but it's=

VO1: =it's like a lake. [ah ha.

VO4: [ya.

VO1: *ya ya I know I know* **[time-gaining]** I think it's match my number two.

VO4: *my my my my* **[time-gaining]** num A picture match number (.) two=

VO1: =<u>two</u>=

4.2.2.7. Forms of message abandonment

In this study, message abandonment can be done in three ways: leaving the message unfinished, using a filler such as 'something like that', and handing over to the partner.

1. Leaving the message unfinished

AU6: <u>So</u>, that's why I choose to talk about (.) u::m (.) u::m polar bear (.) u::h in my project work. And thank you for your (.) a:::h (.) *for you:::r….*

In this excerpt, AU6 could not think of a word at the end of the sentence and let it end abruptly.

2. Using a filler such as "something like that"

VO7: And the mountains (.) and the bottom of the mountains have (.) uh::: (.) have <u>two</u> (2.0) have <u>two holes</u> (.) <u>two very large holes</u> ah::: for (.) for ah::: people can go though in, *something like that*.

VO 7 could not continue the message and ended the sentence with ‘something like that.’ This filler may tell her interlocutor that she has ended the message and the interlocutor may continue or start a new topic.

3. Handing over to the partner

Via voice chat, when students were not able to finish the utterance, they simply handed the floor to the partner.

VO2:Who i::s (.) going to start first?
VO6:Ok? Um:: (.)we are looking a picture for pictures for um::: four pictures of::: um:::about the effect of u::h global warming
VO2:[yes.
VO6: [a::nd ye:s (.) and (.) um:: *ok started at you first Opel?*

VO6 initiated the talk but decided to hand the floor to VO2 because she was not able to continue.

4.2.2.8. Evidence of negotiated interaction

Voice chat allows real-time interaction and facilitates negotiation of meaning among students. Throughout all the voice chat transcripts, the students collaborated extensively in the talks with the goal of completing the task assigned.

VO5: um::: there is (2.0) *mun pen tang tang ah*
((they are shaped like columns)) I don’t know. **[Appeal for help]**
VO8: =alright, alright.= **[Backchannel]**
VO5: =I don’t know how to explain in English **[Appeal for help]**
so (.) sorry to say in Thai.
VO8: oh oh ok. **[Backchannel]** I I I understand it it it

VO5: [so what would you explain? **[Clarification request]**

VO8: [the object in the picture is like a rock right?= **[Confirmation check]**

VO5: =Yeah yeah yeah **[Backchannel]**

VO8: and there is a lot of the snow covered on the rock=

VO5: =yes:: yes. **[Backchannel]** from my picture. How about yours? **[Clarification request]**

VO8: and ah ha=. **[Backchannel]**

VO5: =is it..is there any snow left? Or? **[Clarification request]**

VO8: no no there is a black (.) rock. A lot of rocks in you know in the middle of the picture=

VO5:= ah ha= **[Backchannel]**

VO8:= and the background is like a hill (.) a mountain with (.) a little snow.

VO5: Ah ha. **[Backchannel]**

VO8: What about you? **[Clarification request]** [Cover with the snow.

VO5: [Yeah, **[Backchannel]** I I I couldn't see the background I couldn't see the background the view of the picture. As it is very very white.=

VO8: = ah ha= **[Backchannel]**

VO5: = all I can see is a man standing and he is touching (1.0) the object which what you called it the rock <LAUGH>

VO8: really? you have a ma::n? in your picture? **[Confirmation check]**

VO5: as I told you the man in this picture is uh (.) went went back (.) to his hometown already. <LAUGH>

VO8: really?= **[Confirmation check]**

VO5: =yes. **[Backchannel]**

In this excerpt, VO5 and VO8 were helping one another by offering help when the counterpart showed signs of struggling. They expressed empathy and showed understanding when the partner provided more information. At the end of the talk, they performed a confirmation check to guarantee that they understood the same thing. It is noteworthy that these interactional strategies do not occur in the audioblogs.

4.3 Results of Research Question 3

Research question 3 *- Is there any significant difference between Thai undergraduate students' perceived use of communication strategies before and after participating in DCP?*

Research Question 3 examined the students' perceived communication strategy use before and after the DCP. Wilcoxon Matched-Paired Signed Ranks Test was used to compare the mean scores of the Communication Strategy Inventory (CSI) administered before and after the intervention. Research Hypothesis 3 guides this comparison.

> ***Hypothesis 3:*** *There is a significant difference between Thai undergraduate students' perceived use of communication strategies before and after participating in DCP. Alpha was set at the 0.05 level.*

Table 4.5 shows that there is no statistically significant difference between the students' perceived use of communication strategies before and after the intervention ($Z = .37$, $p < .05$). Therefore, Hypothesis 3 was rejected.

Table 4.5 Findings of Communication Strategies Inventory (CSI) administered before and after DCP

	n	*Mean*	*SD*	*Z*	Sig.	Mean difference
Pre-CSI	9	2.79	.24	.37	.71	.01
Post-CSI	9	2.78	.27			

P* < .5

4.4 Results of Research Question 4

Research question 4 *- What are Thai undergraduate students' opinions about DCP?*

Research Question 4 explored the students' opinions about the intervention. Students' responses to nine semi-structured interview questions, consisting of eight items eliciting attitudes towards benefits and drawbacks of the DCP and one item for suggestions to improve the course, were recorded on an MP3 file format. The data were transcribed and categorized. The findings from the interviews revealed that all students had positive attitudes toward DCP. The only restraint was the use of technology. Students' opinions and suggestions concerning (1) friendly learning environment, (2) self-monitoring, (3) autonomous learning, (4) extra practice time and feedback, (5) integrated skills, and (6) technological problems are discussed as follows:

1. Friendly learning environment

Students reflected that the classroom environment incorporating DCP was relaxing and enjoyable, which lowered their affective filters and stimulated them to participate more in the class. Two students admitted that they were not good at

speaking but because of the friendly classroom environment, they enjoyed the activities and eventually perceived that their speaking skills had improved as shown in the excerpts below.

S8:

"I felt enjoyable every time that I participated in the course. At the beginning, I can't communicate well but I had developed my skill a little. I enjoy so much throughout the course."

English Translation

S8:

"I enjoyed every time I participated in this class. At the beginning, I could not communicate well but my speaking skill gradually developed. I really enjoyed the entire course."

2. Self-monitoring

The findings reveal that DCP allowed students to perform self-monitoring. Each task in DCP required students to record their online performance for formative assessment. Through the recordings, students became more aware of their weaknesses and realized they could avoid making such errors in the future as S5 and S9 state below.

S5:

"Technology helps me in the way that technology helps me to record my project, and when I record it I can hear myself. I can hear my voice. So I know that what did I do, what is my mistake because I can listen to my voice, and I jot down my mistakes and improve it later."

English Translation:

S5:

"Technology helped me to create my project. When recording my voice for the project, I could hear myself. Then I realized how well I did. I jotted down the mistakes to be corrected later."

3. Autonomous learning

Students mentioned that because of the special features of CMC, especially audioblogs, they were encouraged to practice their speaking outside of the class. They enjoyed recording and listening to their voice. One student is a particularly notable case because he did research on his own speech improvement. He recorded all the speaking activities in class and analyzed his own speech to see how he had improved. His excerpt is shown below.

S8:

"I use this (voice recording) with my educational research class to study my improvement. I recorded all the activities I did and used this data to analyze how I improved."

4. Extra practice time and feedback

Students stated that the DCP allowed them to have extra practice time and feedback from the teacher. They revealed that technology such as audioblogs helped them to practice speaking at home and voice chats provided them with opportunities to connect with their teacher outside of the class for feedback or advice. In an EFL context, students did not have a native speaker to practice with. However, they valued opportunities to practice with someone who was more competent such as their teacher.

S7:

"My speaking has been improved because I have to rehearse my script many times. Technology allows me to speak with my teacher in English, someone more professional."

English Translation

S7:

"My speaking has improved because I had to rehearse my script many times. Technology allowed me to speak English with my teacher, someone more proficient."

S4:

"The teacher is very helpful. You tell us one by one about our weaknesses. The technology for communication, the course website, helps us to catch up with the content and the discussion board allows us to ask the teacher for help."

S6:

"The good thing is that we are Thai. We don't really use English outside the classroom. So to use XX (voice chat) to talk with friends and you (the teacher) can help me improve speaking a lot."

5. Integrated skills

It is also reported that students used all language skills to complete their projects. First, they were required to search for information about their project which required them to read extensively. Then, they were to write the script for their 'Global Warming' video clip project which allowed them to practice writing.

Once their scripts had been approved by the teacher, they were to search for shorter video clips to insert in their videos. By doing this, they had a chance to practice their listening skills. Finally, they had to record their speech onto the video which encouraged them to practice speaking as S5 revealed in the excerpt below.

S5:

"I have to use every skill in doing this project. And I have to write my script and I have to practice my speaking to pronounce it clearly. And I have to do the reading as well because I have to read my script. So I think the project helps me improve very much."

6. Technological problems

Students revealed that the main problems they faced while completing the project concerned technology. The video editing program and audioblogs were the most troublesome as most students were not familiar with them and struggled with their use. Common problems the students faced when using the video editing program were being unable to save the file, having different versions from what was used in class, and computers having different specifications causing the program to work improperly. The problem with the audioblogs was mainly about the installation. Some computers required additional programs to be downloaded in order to use an audioblog successfully. Students' problems are reflected in the excerpts below.

S3:

"XXX (audioblog) is too advanced for me. I can't get it to work properly. It always asks me to install some programs I don't know. Now I still can't use it at home."

S5:

"The (video editing) program doesn't work well. When finished, the program did not respond so I had to do everything all over again. But I have a chance to practice more, though."

S7:

"My computer had a new version of XXXX (a video editing program). I had to spend a lot of time trying and trying again for my project……...Some students couldn't get the Internet connection for XX (voice chat) meeting."

In order to solve these technological problems, S1 gave a useful suggestion as presented below.

S1:

"We should spend more time on how to use media such as XXXX (video editing program). It seems easy when we tried it in class. We have little time practice and many students have problems with the program when they do it at home. S4 doesn't know how to get a video clip from XX (a website), so you (the teacher) should teach us."

4.5. Additional findings

Even though this study did not aim to examine the effects of frequency of students' participation via audioblogs and voice chats on their English speaking proficiency, data from the teacher's assignment checklist showed a correlation between students' participation and their performance.

Table 4.6 Additional findings from teacher's assignment checklist

Students/ Weeks	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total AU/VO**
AU/VO 1	X	X/	/	X	/	X	X	//	//	X	7/6
AU/VO 2	X	X/	//	X	//	X	X/	//	//	X	10/6
AU/VO 3	X	X/	/	X	/	X	X	/	/	X	5/6
AU/VO 4	X	X/	//	X	///	X	X/	///	////	X	14/6
AU/VO 5	X	X/	//	X	/	X	X	//	//	X	8/6
AU/VO 6	X	X/	/	X	/	X	X	//	//	X	7/6
AU/VO 7	X	X/	/	X	/	X	X	//	//	X	7/6
AU/VO 8	X	X/	/	X	//	X	X//	///	///	X//	12/6
AU/VO 9	X	X/	//	X	//	X	X	////	////	X//	15/6

/ = Audioblogs, X = Voice Chats

Table 4.6 shows that AU/ VO 2, AU/ VO 4, AU/ VO 8, and AU/ VO 9, who had high scores on project work and post-tests, participated in audioblogs (/) more often than the average student. Students' participation via voice chats (X) was all equal (six times) because students were assigned to perform the tasks on particular weeks. This teacher's assignment checklist shows that all students completed all six assigned tasks.

Students' interactions with their peers and teacher via voice chats using their personal accounts were not counted on the checklist. However, it is noteworthy to mention that students did become familiar with the tools and used them more frequently.

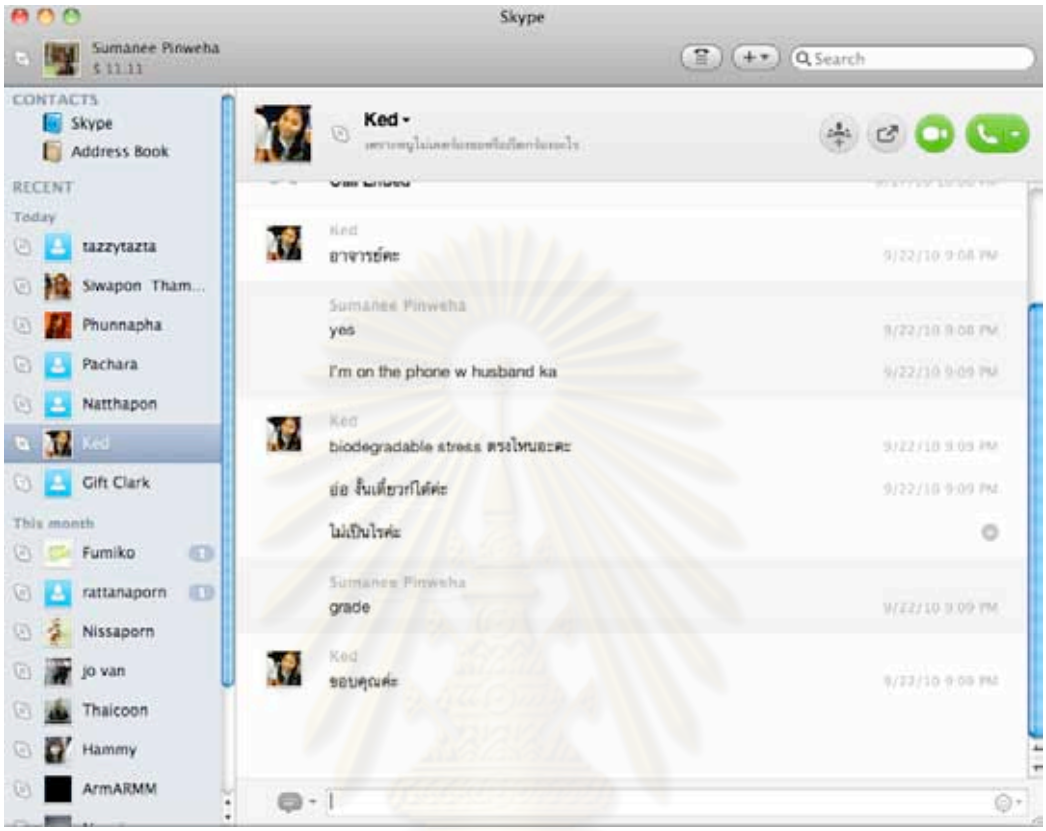


Figure 4.2 Student's voice chat

Figure 4.2 shows that the student used her own voice chat account and stopped by to have a chat with her teacher. The conversation was about how to put the stress on 'biodegradable.' Some other students did the same thing with various topics.

4.6. Chapter summary

This chapter discusses the findings from data analyses to answer the four research questions regarding the effects of DCP on the students' English speaking proficiency and communication strategy use, as well as conveys their opinions about the intervention. After participating in DCP, the students' English speaking

proficiency improved significantly. Students employed a wide range of communication strategies while communicating via audioblogs and voice chats. The most frequently used communication strategies in each category were all-purpose words, sound-lengthening, minor pauses, and comprehension check. However, the findings from the Communication Strategy Inventory revealed that all-purpose words, approximation, and circumlocution were the most frequently used. The patterns of communication strategy use via CMC were the use of multiple strategies for one target, one strategy having many functions, forms of message abandonment, and evidence of negotiated interaction. The mean scores of the Communication Strategy Inventory administered before and after the intervention were compared to determine the change in students' perceived use of communication strategies. However, there were no significant differences. The findings from the semi-structured interviews revealed that students had a positive attitude towards the DCP and that they attentively participated in the activities which may lead to improvement in their English speaking proficiency. Addition findings were shown to support this claim. Discussion of the findings, pedagogical implications, and recommendations for future research are discussed in the next chapter.

CHAPTER V
DISCUSSION AND CONCLUSION

This chapter concludes the current study by summarizing the study and research findings, elaborating on the discussion, and providing pedagogical implications drawn from the findings.

5.1 Summary of the study

This study investigates the impact of Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work (DCP) on Thai undergraduate students' English speaking proficiency and explores their communication strategies while participating in this intervention.

The study aims to answer the following research questions:

1. To what extent does Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work (DCP) improve Thai undergraduate students' English speaking proficiency?
2. What communication strategies do Thai undergraduate students use while participating in DCP?
3. Is there any significant difference between Thai undergraduate students' perceived use of communication strategies before and after participating in DCP?
4. What are Thai undergraduate students' opinions about DCP?

Participants

The participants of this study were 9 Thai students majoring in English from a public university in Thailand, who enrolled in the Speech Improvement course. This was a 16-week elective course (2 hours a week) designed to enhance students' English speaking proficiency focusing on English oral communication and daily social interactions. The students, whose ages ranged from 18-21, were pre-service teachers and were in the fourth year of a 5-year program. The selection of the participants in this study adopted a purposive sampling technique. Only English-major students who had a sufficient level of English (intermediate level) participated in this study. Based on the TOEIC Speaking pre-test scores, all students were in the intermediate to upper-intermediate level. Half of them had been exposed to the synchronous CMC (voice chat) before but none had experienced asynchronous CMC (audioblog).

Procedures

The instruction for this study was prepared according to three relevant theories: differentiated instruction, computer-mediated communication, and project-based instruction. All participants were introduced to DCP, a specially designed 10-week speaking intervention. However, the data collection was completed on the fifteenth week.

Data Collection

To answer research question one, the mean scores of TOEIC Speaking pre- and post-tests were compared to study the effects of DCP on students' English speaking proficiency. Scores from the TOEIC Speaking pre- and post-tests were computed using The Wilcoxon Matched-Paired Signed Ranks Test, a

nonparametric statistic for related samples. Cohen's *d* was also used to calculate the effect size.

Research question two explores communication strategies that Thai undergraduate students used while participating in DCP. Students' audioblogs and voice chats were transcribed based on transcription conventions of Markee and Kasper (2004), Silverman (2006), and MICASE (2002) for conversation analysis resulting in categories of communication strategies used for coding. These communication strategies were categorized by the researcher and an experienced tertiary-level English instructor using card sorting technique. For triangulation, the mean scores of the Communication Strategy Inventory administered after the intervention were calculated. The findings from both sources were then compared.

Research question three examines the students' perceived use of communication strategies before and after DCP. The Wilcoxon Matched-Paired Signed Ranks Test was used to compare the means scores of the Communication Strategy Inventory (CSI) administered before and after the intervention.

Research question four explores the students' opinions about the intervention. Students' responses to nine semi-structured interview questions, consisting of eight items eliciting attitudes towards benefits and drawbacks of the DCP, and one item for suggestions to improve the course, were recorded on MP3 file format. The data were transcribed and categorized.

Summary of findings

The data from the TOEIC Speaking pre- and post-tests revealed significant improvement in students' speaking proficiency. Students also employed a wide range of communication strategies while communicating via audioblogs and voice chats. The most frequently used communication strategies in each category were

all-purpose words (compensatory), sound-lengthening (time-gaining), minor pauses (emphasis), and comprehension check (interactional). However, the findings from the Communication Strategy Inventory revealed that all-purpose words, approximation, and circumlocution were the most frequently used. The patterns of communication strategy use via CMC were the use of multiple strategies for one target, one strategy having many functions, forms of message abandonment, and evidence of negotiated interaction. The mean scores of the Communication Strategy Inventory administered before and after the intervention were compared to determine the change in students' perceived use of communication strategies. However, they were not significantly different. The findings from the semi-structured interviews revealed that students had a positive attitude towards DCP and that they attentively participated in the activities which may lead to their improvement of English speaking proficiency.

5.2 Discussion

The discussion will be presented in three aspects: DCP and gains in English speaking proficiency, communication strategies via CMC, and patterns of communication strategy use in CMC.

5.2.1. DCP and gains in English speaking proficiency

The comparison of the mean scores from the TOEIC Speaking pre- and post-tests shows that students' English speaking proficiency significantly improved in all criteria. These findings can be interpreted as the benefits of an integration of differentiated instruction, Computer-Mediated Communication, and project work.

In differentiated instruction, the teacher takes account of the students' variability. During DCP, the students' learning was closely monitored. Their proficiency level, interests, and background were identified and the teacher prepared lessons and provided proper guidelines corresponding to each student's needs. As a result, students reflected in the interviews that their improved English speaking abilities can be attributed to extra practice time and feedback. This finding supports Tomlinson and Cooper's (2006) statement that teachers should first know their students so that they can create effective lessons and provide proper guidance.

Computer-Mediated Communication in DCP also contributed to students' improvement due to its friendly environment and support in self-monitoring. The findings revealed that students felt the course was relaxing and enjoyable. This friendly environment stimulated students' participation, possibly leading to improvement in their speaking proficiency. The findings concur with Krashen's Affective Filter Hypothesis (1985), which suggests that learners with a low affective filter (high motivation, self-confidence, and low anxiety) tended to be successful language learners. These findings also confirm previous studies on CMC (Beauvois; 1997, Chun, 1998; and Warschauer, 1996) i.e., which state that CMC creates an enjoyable environment ideal for language learning. However, it is beyond the scope of this study to examine how DCP affects the four components of second language performance, namely, complexity, accuracy, fluency, and lexis (Skehan, 2009).

Self-monitoring was also facilitated in the DCP environment during CMC. Based on Schmidt's Noticing Hypothesis (1990), input becomes intake through conscious awareness (noticing) of grammar. Swain (1985) shares a similar belief that language learners should be encouraged to make comprehensible output so

that they notice the gaps, test hypotheses, and consciously think about the language system (metalinguistic function) for successful communication. In DCP, students' improvement in speaking proficiency may result from having opportunities to monitor their own speech, trying out the new forms, and eventually being able to pick appropriate forms for the context.

With an integration of project-based instruction, an instructional approach that engages learners with meaningful and authentic tasks (Beckett, 1990), DCP becomes more effective. The findings show that it promotes learner autonomy and integrated skills that may lead to students' improvement in English speaking proficiency. Previous studies on project-based instruction show that students became more autonomous learners when they were engaged in designing and developing the project (Gu, 2002; Ho, 2003; Lee, 2002). In DCP, students took part in choosing the topic, brainstorming the project work assessment rubrics, planning, and creating the final project. This might help students develop a sense of ownership and responsibility for their own learning.

Furthermore, improved English speaking proficiency may result from incorporating project work. As the students followed each stage of the project work, they performed different tasks such as searching for information, reading articles, writing the script, watching and listening to video clips, recording speech, and incorporating all sources used in the project which required different skills. Therefore, students reflected that all their language skills: speaking, listening, reading, and writing were enhanced.

In addition, while creating video clips, students were also involved in a new literacy called multimodality. According to Kress (2010), there is a tremendous change in the way communication occurring in the era of globalization. Books and the pages now appear on a computer screen, replacing

the technologies of print by digital, electronic means. The previous mode of writing has likewise been transformed by the mode of images. There is now an integration of different modes such as writing, image, and color to convey the message. Multimodality addresses how different modes of communication convey meaning and in DCP, students integrate the script, images, color, and music to present their intended message. This may help prepare the students for the new literacy of the digital era.

However, the benefits of DCP demonstrated in studies should be interpreted with caution. The students might be excited about being part of a new intervention and therefore work harder to perform their best. Landsberger (1958) described this phenomenon as the Hawthorne effect, an effect which occurs when participants perform differently when they know they are being studied. In this study, students were informed that they would be experiencing a new speaking intervention but the foci on speaking proficiency and communication strategies were not fully revealed.

5.2.2. Communication strategies via CMC

It was found that CMC extensively stimulated the use of communication strategies. Five major communication strategies emerged from analysis of audioblogs and voice chats: compensatory, time-gaining, emphasizing, avoidance, and interactional strategies - consistent with Cohen and Dörnyei's (2002) classification of communication strategies which includes all of the above except emphasizing. Since this study employed conversation analysis to examine online oral interaction, emphasizing strategies, i.e. the use of high volume/stresses and pauses, emerged from the data. It was also found that the communication strategies used in audioblogs and voice chats were different. In audioblogs where

there was no interaction, students used avoidance, compensatory, time-gaining, and emphasizing to get their messages across. These findings correspond to Faerch and Kasper's (1983) statement that without cooperative assistance, students can find ways to cope with communication problems. For example, on audioblogs, students frequently used all-purpose words such as “good” for the words, *acceptable*, *attractive*, or *fluent*, and “parts” for the words, *criteria* or *components* in different contexts. This might be because students could not expect their partners’ help by asking for clarification or making a confirmation check so that they employed all-purpose words to compensate for the unknown words.

One surprising finding that should be further explored is that the ‘use of L1’ strategy did not occur in the audioblogs or in the text-based CMC (Smith, 2003). This may prove insightful for EFL teachers who plan to use audioblogs to stimulate the L2 use. However, this study does not suggest that occasional L1 use in the voice chats would have a negative effect on language learning since there have been studies that show the benefits of L1 use as well.

In the voice chats, there was evidence of extensive use of communication strategies in students’ negotiated interactions. These findings concur with Yule and Tarone's (1997) statement that native speakers employed communication strategies as well. However, they “mostly seem to employ a somewhat larger sub-technical vocabulary than the L2 learners” and they tend “to use more analytical strategies, producing a greater volume of talk, than the learners who generally favor more holistic strategies” (p. 21). It can be concluded that the use of communication strategies is common for both the L2 learners and native speakers; however, the degree of use is different. In this study, whether playing a speaker's role or interlocutor's role, students employed multiple interactional strategies to show or check understanding and to ask for or offer help. The students'

engagement in these interactions likely contributed to their language learning.

5.2.3. Patterns of communication strategy use in CMC

Besides exploring *what* communication strategies were employed, this study also discovered *how* these strategies were used in CMC. The patterns of communication strategy use in a CMC environment may give language teachers insights into how the language is used and whether or not these patterns should be taught. The patterns reported in this study include multiple strategies for one target, one strategy for many functions and negotiated interaction.

The findings show that students tended to use several communication strategies for one target word or phrase. These findings likewise support Yule and Tarone's (1997) statement regarding native speakers' use of communication strategies. It would be worthwhile for future studies however to compare the use of communication strategies via CMC by L2 learners and native speakers.

Because of the finding that one strategy may perform different functions, interpretation was done with caution. The researcher and her peer-coder were aware of conflicting interpretations when coding the same strategy in different contexts. Fillers, for example, were found to perform four functions: to indicate a new topic or sentence, to gain more time, to signal self-correction and to end an utterance.

"Ok" can be used to indicate a new topic or a new sentence, to gain more time to think of a word, to signal self-corrections, and to end an utterance. "Uh" or "um" were also found to have different functions. For example, students may use "uh" to gain more time as in, "There is *uh*… **[gaining more time]** icy mountain at the background of the picture…," while "um" was used to indicate a new sentence as in, "*Umm*…**[indicating a new sentence]** it is the sheet of ice.

Umm…**[indicating a new sentence]** there are some cracks but not much." These findings agree with Clark and Fox Tree's (2002) study about fillers, i.e., that speakers use "*uh*" or "*um*" to (1) indicate that they are searching for words, (2) decide what to say next, and (3) signify whether to keep or cede the floor. Even though their study only focused on two fillers, the stated functions are applicable to the current study.

In addition to fillers, functions of short or long pauses can be tricky to concretely specify. Ward (1994) stated, "pauses have many functions. Some pauses contribute to prosody, and so convey meaning or mark clause boundaries. Some pauses serve discourse functions, for example, to indicate deference to or fear of the hearer, to allow the hearer a chance to take a conversational turn, or to pretend to the hearer to be doing any of the above. Some pauses probably provide time to monitor one's own speech" (p. 203). This can be interpreted to mean that one needs to understand the context and the speaker's intention. Garman (1990) categorized pauses as having three functions: (1) physiological, (2) cognitive, and (3) communicative. The physiological function of pauses is to allow the speaker to inhale, the cognitive function is to allow the speaker to plan ahead, and the communicative function is to signal the speech unit to the listeners. The two functions of pauses in this study —time-gaining and emphasizing —may belong to the cognitive and communicative functions. Students may pause to gain more time to think about what to say and may also pause to signify the emphasized unit within their speech.

The findings also show evidence of extensive use of communication strategies in students' negotiated interactions in voice chats. In this study, whether playing the speaker's role or interlocutor's role, students employed multiple interactional strategies to show or check understanding and to ask for or offer

help. One of the most interesting interactions was between VO2 and VO7 via voice chats. VO2 acquired a new word “spike” while negotiating meaning with VO7. First, VO2 explained the picture (see Figure 4.1) as “pillars of the ice.” She asked for help several times for the right word. VO7 made a guess (fissure) and asked for confirmation. Later, VO7 took her turn and described the picture she had as “spiky shaped rocks.” VO2 picked up the new word and concluded her explanation as “spikes of the rock.”

Student engagement such as exhibited in this interaction can contribute to their language learning. Nakatani (2010) found that the use of communication strategies could enhance student communicative ability. This study supports his finding and also demonstrates that students’ participation via CMC has a positive correlation with their performance. Students with higher scores on the project work and post-tests tended to use CMC more often than their peers. This also confirms that CMC is an invaluable tool to promote EFL students’ engagement and willingness to orally communicate extensively and meaningfully.

Another interesting finding that should be pointed out concerns students’ perceived use of communication strategies before and after the DCP. It was found that there were no significant differences in perceived use of these strategies. This concurs with a study of Farrell (2001) which shows that, even with an intensive 18-hour training, students could not break their ‘old habits’ (p. 638) and tended to use the strategies they were comfortable with. This suggests that it takes time for one to change his or her use of strategies. Even though Farrell studied reading strategies, his finding is also applicable to this study. 10 weeks without communication strategy instruction may be too short a time to see the differences in students’ communication strategy use online.

5.3. Conclusion

This study investigates the effects of a speaking intervention with Differentiated Speaking Instruction using Computer-Mediated Communication and Project Work on Thai undergraduate students' speaking proficiency, explores students' use of communication strategies via audioblogs and voice chats, and solicits students' opinions about the intervention.

The findings support previous studies on the benefits of differentiated instruction, computer-mediated communication, and project work for English speaking proficiency. Differentiated instruction allowed teachers to closely monitor students' learning and provide proper guidance and feedback corresponding to each student's needs. CMC provides a friendly learning environment and promotes self-monitoring and pushes output. The integration of the process of project work engaged the students in meaningful and authentic tasks and enhanced autonomous learning and integrated other language skills.

The present study also highlights the contributions of communication strategy use to language learning. Communication strategies were extensively used in CMC while students negotiated meaning. According to Nakatani (2010), the more students used communication strategies to maintain conversation flow, the more their language proficiency was enhanced. That there is no 'L1 use' in audioblogs may also challenge EFL teachers to integrate audioblogs into their lessons.

The patterns of communication strategy use also imply that future researchers' should use careful interpretation of coding for communication strategies. This is because some communication strategies, such as fillers and use of pauses may have different functions depending on the context. Without a consistent system and an effective tool for coding different functions of

communication strategies, the study may end up with a 'taxonomy with doubtful validity' as Bialystok (1990) argued. Finally, the findings showed that without communication strategy instruction, students perceived the same use of communication strategies as they had previously.

5.4. Pedagogical implications

The findings of this study have pedagogical implications in three areas: positive learning environment, students' agency in speaking proficiency, and EFL education. The learning environment plays a significant role in promoting students' English speaking proficiency. In a friendly learning environment with motivating lessons, students were willing to actively and effectively communicate in class. It is vital for teachers, institutions, and policy makers to realize the impact of a positive learning environment and adapt their goals to lower students' affective filters, in particular, confidence, motivation, and anxiety.

Moreover, students should recognize that 'agency,' initiative, autonomy, self-regulation, and self-determination about one's own learning (van Lier, 2008), are essential for successful language learning. Students should actively participate in class and be responsible for practicing the language outside of class. In an era of globalization, students can easily gain access to numerous online resources and be extensively exposed to the language used by native and non-native speakers. Online tools, such as audioblogs, allow students to practice their speaking, share their recordings with a real audience, and get feedback from the online community. Students' speaking proficiency can improve significantly this way because they are exposed to comprehensible input, and are stimulated to generate an output.

Finally, EFL educators should take into account their students' variability when designing a curriculum as no two students are the same. Based on differentiated instruction, the curriculum and the course designer should provide multiple ways to access content for students with different backgrounds, interests, and learning profiles. This way, students' different needs can be served.

5.5. Recommendations for further study

Based on the findings of the present study, there are three suggestions for future study regarding sample size, integration of technology into the classroom, and data collection and data analysis processes.

Due to a small sample size, the findings of this study may not be generalized to the whole population. In future studies, DCP may be conducted in different settings with a larger number of participants.

Secondly, when integrating the use of technology into the classroom, it may be useful to introduce the tool before the implementation of the main study. This might lessen the chance of technical problems which occur as the students will be more familiar with the tool.

In addition, when collecting data for the study of communication strategy, it is advisable to capture the students’ other features, such as gestures, intonation, or volume of voice, which may indicate communication strategies. Concerning the data analysis, the transcribing process of these features should be consistent and systematic. Smith and Gorsuch (2004) suggested the usability lab (UL) for text-based CMC. However, it is still questionable as to whether it would be applicable for voice CMC. In this study, conversation analysis was adopted for the transcription convention because voice CMC shares similar features to spoken discourse. The transcription convention was found to be effective and informative.

Therefore, the data analysis in future studies may be more powerful if video recording and conversation analysis are incorporated.

REFERENCES

Abrams, Z. I. (2003). The effects of synchronous and asynchronous CMC on oral performance in German. *The Modern Language Journal. 87* (2): 155-167.

Ahn, H. (2006). *The impact of individual learner characteristics and synchronous computer-mediated communication on language production in learners of English*. Unpublished Doctoral Dissertation, University of Arizona.

Alan, B., and Stoller, F. L. (2005). Maximizing the Benefits of Project Work in Foreign Language Classrooms. *English Teaching Forum, 43* (4): 10-21.

Andrews, C. (2000). Project-oriented use of the World Wide Web for teaching and learning culture. *Computer Assisted Language Learning, 13* (4-5): 357-376.

Ashley, J. (2003). *Synchronous and Asynchronous Tools*. [Online]. Avialable from: http://www.asaecenter.org/PublicationsResources/articledetail.cfm?ItemNumber=13572 [2009, March 21]

Atkinson, J. M., and Heritage, J. (1984). *Structures of Social Action: Studies in Conversation Analysis*, Cambridge: Cambridge University Press.

Bailey, K. (2005). *Practical English Language Teaching*. Singapore: McGraw-Hill.

Bailey, K. (2006). Issues in teaching speaking skills to adult ESOL learners. *Review of Adult Learning and Literacy*. [Online]. Available from: http://www.ncsall.net.fileadmin/resources/ann_rev/comings_ch5.pdf [2009, March 15]

Barson, J. (1997). Space, time and form in the project-based foreign language classroom. In R. Debski, J. Gassin & M. Smith (Eds.), Language learning though social computing (pp. 3-37). *Applied Linguistics Association of Australia*, Occasional Papers 16.

Barson, J., and Debski, R. (1996). Calling back CALL: Technology in the service of foreign langauge teaching based on creativity, contingency and goal-oriented activity. In M. Warschauer (Ed.). *Telecollaboration in foreign language learning* (pp. 49-68). Honolulu, HI: University of Hawai'I Second Language Teaching and Curriculum Center.

Beauvois, M.H. (1992). Computer-assisted classroom discussion in the foreign language classroom: Conversation in slow motion. *Foreign Language Annals, 25* (5): 455-464.

Beauvois, M. H. (1997). Write to speak: the effects of electronic communication on the oral achievement of fourth semester French students. In J. Muyskens (Ed.), *New ways of Learning and Teaching: Issues in Language Program Direction* (pp. 93-115). Boston: Heinle & Heinle.

Beckett, G. H. (1990). *Project-based instruction in a Canadian secondary school's ESL classes: Goals and evaluations*. Unpublished Doctoral Dissertation, University of British Columbia. Vancouver.

Beckett, G. H. (2002). Teacher and student evaluation of project-based instruction. *TESL Canada Journal*, 19(2): 52-66.

Beckett, G. H., and Slater, T. (2005). The Project Framework: a tool for language, content, and skills integration. *ELT Journal*, 59(2): 108-116.

Beckett, G. H., and Miller, P. C. (2006). *Project-Based Second and Foreign Language Education: Past, Present, and Future*. Connecticut: Information Age Publishing.

Bell, J. (1993). Doing your research project. 2nd ed. Bristol, PA: Open University Press.

Bialystok, E. (1990). Communication Strategies. Oxford: Blackwell.

Biyaem, S. (1997). *Learner training: Changing roles for a changing world, educational innovation for sustainable development*. 3 rd UNESCO-ACEID International conference, Bangkok.

Blake, R. (2000). Computer mediated communication: A window on L2 Spanish interlanguage. *Language Learning&Technology*, 4 (1): 120-136.

Brown, G., and Yule, G. (1983). *Teaching the Spoken Language: An approach based on the analysis of conversational English*. Cambridge: Cambridge University Press.

Brown, H.C. (1994). *Principles of Language Learning and Teaching*. London: Prentice Hall.

Burns, A. (1998). Teaching speaking. *Annual Review of Applied Linguistics*. (18): 102-123.

Burns, A., and Joyce, H. (1997). *Focus on Speaking*. Sydney: NCELTR.

Bygate, M. (1987). *Speaking*. Oxford: Oxford University Press.

Bygate, M. (2001.) Speaking. In R. Carter & D. Nunan (Eds.), *The Cambridge guide to teaching English to speakers of other languages* (pp. 14-20). Cambridge: Cambridge University Press.

Canale, M. (1983). From communicative competence to communicative language pedagogy. In Richards, J. C., & Schmidt, R. W. (Eds.), *Language and Communication,* pp. 2-27. London: Longman.

Canale, M., and Swain, M. (1980). Theoretical bases of communicative approaches to second language teaching and testing. *Applied Linguistics*, 1 (1): 1-47.

Chamot, A. U. (1987). The learning strategies of ESL students. In A. Wenden. & J. Rubin (Eds.), *Learner strategies in language leaning,* 71-84. Englewood Cliffs: Prentice-Hall.

Chan, V. (2001). Determining students' language needs in a tertiary setting. *English Teaching Forum*. 39 (3): 16-27.

Charmaz, K. (2006). Constructing Grounded Theory. CA: SAGE Publications.

Cheon, H. (2003). The viability of computer mediated communication in the Korean secondary EFL classroom. *Asian EFL Journal,* 5 (1). [Online]. Available from: http://www.asian-efl-journal.com/march03.sub2.php [2006, January 31]

Chinnery, G.M. (2005). Speaking and Listening Online: A Survey of Internet Resources. *English Teaching Forum,* 43 (3): 10-16.

Chomsky, N. (1957). *Syntactic structures*. The Hague: Mouton.

Chun, D. (1994). Using computer networking to facilitate the acquisition of interactive competence. *System,* 22(1): 17-31.

Chun, D., 1998. Using computer-assisted class discussion to facilitate the acquisition of interactive com- petence. In: Swaffar, J.S., Romano, P., Markley, K., Arens, X. (Eds.), *Language Learning Online: Theory and Practice in the ESL and L2 Computer Classroom*. Labyrinth Publications, Austin, TX, pp. 57–80.

Clark, H. H., and Fox Tree, J. E. (2002). Using *uh* and *um* in spontaneous speech. *Cognition* , (84): 73-111.

Cohen, A. D. (1990*). Language Learning: Insights for Learners, Teachers, and Researchers*. Boston, MA: Heinle & Heinle.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.

Cohen, A. D., and Dornyei, Z. (2002). Focus on the Language Learner: Motivation, Styles and Strategies. In N. Schmitt (Ed.) *An Introduction to Applied Linguistics.* (pp.170-190). London: Arnold.

Cohen, A.D., and Scott, K. (1996). A synthesis of approaches to assessing language learning strategies. In R. Oxford (Ed.), *Language Learning Strategies Around the World: Cross-cultural Perspectives* (pp. 89-106). Manoa: University of Hawaii Press.

Corder, P. (1983). Strategies of communication. In C. Faerch & G. Kasper (eds.) *Strategies in Interlanguage Communication*, London: Longman.

Corley, M. A. (2005) *Differentiated Instruction: Adjusting to the needs of all learners*. [Online]. Available from: http://www.ncsall.net/?id=736 [2009, February 3]

Crook, C. (1994). *Computers and the collaborative experience of learning*. London: Routledge.

Csikszentmihalyi, M. (1990). *Flow: The Psychology of Optimal Experience. New York: Harper& Row.*

Debski, R. (2006). *Project-based language teaching with technology.* Sydney: National Center for English Languge Teaching and Research.

Debski, R., Gassin, J., and Smith, M. (1997). Language learning through social computing. *Applied Linguistics Association of Australia,* Occasional Papers 16.

Dörnyei, Z. (1995). On the Teachability of Communication Strategies. *TESOL QUARTERLY*, (29): 55-85.

Dörnyei, Z. (2003). *Questionnaires in second language research: construction, administration, and processing*. New Jersey: Lawrence Erlbaum Associates Publishers.

Dörnyei, Z. (2007). *Research methods in applied linguistics : quantitative, qualitative, and mixed methodologies*. Oxford: Oxford University Press.

Dörnyei, Z., and Scott, M.L. (2002). Review Article: Communication strategies in a second language: Definition and taxonomies. *Language Learning*, 47 (1): 173-210.

Dreyer, C., and Oxford, R. L. (1996). Learning strategies and other predictors of ESL proficiency among Afrikaans-speakers in South Africa. In Oxford, R. L. (Ed.), *Language learning strategies around the world: Cross-cultural perspectives* (pp.61-74). Manoa: University of Hawaii Press.

Dudeney, G., and Hockly, N. (2007). *How to teach English with technology*. Essex: Pearson Education.

Dulay, H., Burt, M., and Krashen, S. (1982). *Language two*. Oxford: Oxford University Press.

Educational Testing Service. (2007). TOEIC Examinee Handbook: Speaking & Writing. Princton, NJ: Educational Testing Service. [Online]. Available from: http://www.educationmac.com/_files/userfiles/files/TOEIC_Speaking_and_Writing_Examinee_Handbook.pdf [2009, March 15]

Egbert, J. L. (2005). Conducting research on CALL. In J. L. Egbert & G. M. Petrie (Eds.), *CALL research perspectives* (pp.3-8). Mahwah, NJ: Lawrence Erlbaum.

Ellis, R. (1994). *The study of second language acquisition*. Oxford: Oxford University Press.

Ellis, R. (2003). *Task-based language learning and teaching*. Oxford: Oxford University Press.

Epstein, R., and Ormiston, M. (2005). Project and community contact materials. *English Language Teaching Materials: A Practical Guide.* (pp. 284-308). CERTESL Program, University of Saskatchewan: Canada.

Ewing, M. (2000). Conversations of Indonesian language students on computer-mediated projects: Linguistic responsibility and control. *Computer Assisted Language Learning*, 13 (4): 333–356.

Eyring, J. L. (1989). *Teacher experience and student responses in ESL project work instruction: A case study*. Doctoral Dissertation. University of California, Los Angeles.

Faerch, C., and Kasper, G. (1983). Plans and strategies in foreign language communication. In C. Fearch & G. Kasper (Eds.), *Strategies in interlanguage communication.* (pp. 20-60). Harlow, UK: Longman.

Farrell, T. (2001). Teaching reading strategies: 'It takes time!' *Reading in a Foreign Language*, 13(2): 631-646.

Fernandez-Garcia, M., and Martinez-Arbelaiz, A. (2002). Negotiation of meaning in non-native speaker-on-native speaker synchronous discussions. *CALICO Journal*, 19(2): 279-294.

Field, A. (2009). *Discovery Statistics Using SPSS*. London: SAGE Publications.

Florez, M. (1999). *Improving adult English language learners' speaking skills.* Washington, DC: ERIC Clearinghouse for ESL Literacy Education. (ERIC Document Reproduction Service No. EDO-LE-99-01.

Fried-Booth, D. L. (1986). *Project work*. Oxford: Oxford University Press.

Fried-Booth, D. L. (2002). *Project work* (2nd ed.). New York: Oxford University Press.

Gardner, H. (1993). *Multiple intelligences*: *the theory in practice*. New York: Basic Books.

Garman, M. (1990). *Cambridge textbooks in linguistics: psycholinguistics.* Cambridge: Cambridge University Press.

Graddol, D. (2006). *English Next*. UK: The English Company.

Gu, P. (2002). Effects of project-based CALL on Chinese EFL learners. *Asian Journal of English Language Teaching*, (12): 195-210.

Haines, S. (1989). *Projects for the EFL classroom: Resource material for teacher.* Walton-on-Thames, UK: Nelson.

Hall, T. (2002). *Differentiated Instruction*. Wakefield, MA: National Center on Accessing the General Curriculum. [Online]. Availble from: http://www.cast.org/publications/ncac/ncac_diffinstruc.html [2009, February 3]

Hample, R., and Hauck, M. (2004). Towards an effective use of audio conferencing in distance language courses. Language Learning and Technology, 8 (1): 66-82. [Online]. Available from: http://llt.msu.edu/vol8num1/hampel/default.html [2008, March 15]

Harley, B., Allen, P., Cummins, J., and Swain, M. (1990). *The development of second language proficiency.* Cambridge: Cambridge University Press.

Hedge, T. (1993). Project work. *English Language Teaching Journal,* 47(3): 276-277.

Herring, S. C. (1996). *Computer-Mediated Communication: Linguistic, Social and Cross-Cultural Perspectives*. Amsterdam: John Benjamins Publishing.

Ho, R. (2003). *Project approach: teaching.* (2nd ed). (ERIC Document Reproduction Service No. ED. 478 224)

Horwitz, E. K., Horwitz, M. B., and Cope, J. A.(1991). Foreign language classroom anxiety. In E. K. Horwitz & D. J. Young (Eds.), *Language Anxiety: From theory and research to classroom implication* (pp.27-36). Englewood Cliffs, NJ: Prentice Hall.

Hughes, A. (2003). *Testing for language teachers*. Cambridge: Cambridge University Press.

Hulin, C. L., Drasgow, F., and Parsons, C. K. (1983). *Item Response Theory*. Illinois: Dow Jones-Irwin.

Hymes, D. (1974). *Foundations in Sociolinguistics*. Philadelphia: University of Pennsylvania Press.

Jacobs, G., and Farrell, T. (2003). Understanding and Implementing the CLT Paradigm. *RELC Journal,* 41(1): 5-30.

Jeon-Ellis, G., Debski, R., and Wiggleworth, G. (2005). Oral interaction around computers in the Project-oriented CALL classroom. *Language Learning & Technology, 9* (3): 121-145.

Jones, P. (1996). Planning an oral language program. In Pauline Jones (ed), *Talking to Learn,* pp.12-26. Melbourne: PETA.

Kasper, G., and E. Kellerman. (1997). *Communication Strategies. Psycholinguistic and sociolinguistic perspectives.* London: Longman.

Kayser, A. (2002). Creating Meaningful Web Pages: A project-based course. *English Teaching Forum,* 40 (3): 12-19.

Kelm, O. R. (1992). The use of synchronous computer networks in second language instruction: a preliminary report. *Foreign Language Annuals,* (25): 441-454.

Kelm, O. R. (1996). The application of computer networking in foreign language education: Focusing on principles of second language acquisition. In M.

Warschauer (Ed.), *Telecollaboration in foreign language learning*: Proceeding of the Hawai'I Symposium. Hawaii: Second language teaching and curriculum center.

Kern, R. (1995). Restructuring classroom interaction with networked computers: effects on quantity and characteristics of language production. *The Modern Language Journal*, (79): 457-476.

Khamis, H. (2010). Communication Strategies in CMC: An Egyptian EFL Context. *CALICO*, 28 (1): 35-48.

Khunmuen, W. (2003). A *Study of the English Communication Problems of Business English Students at Suan Dusit Rajabhat Institute with Foreign Teachers*. Master's Thesis, Ramkamhaeng University, Bangkok.

Kim, S. Y. (2003). A combination of CMC and FFC: its effects on Korean students' oral proficiency and attitudes. *English Teaching*, 58(1): 61-80.

Kobayashi, M. (2004). *A sociocultural study of second language tasks: Activity, agency, and language socialization*. Doctoral Dissertation, University of British Columbia, Vancouver.

Krashen, S. (1985). *The Input Hypothesis: Issues and Implications*. London: Longman.

Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. New York: Routledge.

Lamy, M., and Hampel, R. (2007). *Online Communication in Language Learning and Teaching*. New York: Palgrave Macmillan.

Landsberger, H. A. (1958). *Hawthorne Revisited*. New York: Cornell University.

Lee, I. (2002). Project work made easy in the language classroom. *Canadian Modern Language Review*, (59): 282-290.

Levelt, W. (1989). *Speaking: From Intention to Articulation*. Cambridge, MA.

Levy, M. (1997). Project-based learning for language teachers: Reflecting on the process. In R. Debski, J. Gassin, & M. Smith (Eds.), *Language learning through social computing* (pp. 181-191). Melbourne: Applied Linguistic Association of Australia and Horwood Language Center.

Liddicoat, A.J. (2007). *Introduction to Conversation Analysis*. Continuum: London

Long, M. (1996). The role of the linguistic environment in second language acquisition. In W. Ritchie and T. Bhatia (Eds.), *Handbook of second language acquisition* (pp. 413-468). San Diego: Academic Press,.

Long, M. (2006). *Problems in SLA*. Mahwah, NJ: Lawrence Erlbaum Associates.

Markee, N. , and Kasper, G. (2004). Classroom Talks: An Introduction. *Modern Language Journal*, (88): 491-497.

Maskhao, P. (2006). *A Case Study of English as a Foreign Language (EFL) Acquisition in a Postgraduate Diploma Course.* Doctoral Dissetation, University of Queensland, St. Lucia, Qld.

McTighe, J., and O' Conner, K. (2005). Seven practices for effective learning. *Educational Leadership,* (63): 10-17.

Mills, Steven C., (2006).*Using the Internet for Active Teaching and Learning*. Pearson Merrill Prentice Hall: New Jersey.

Milton, J. (2005). From parrots to puppet masters: Fostering creative and authentic language use with online tools. In B. Holmberg, M. Shelly, & C. White (Eds.), *Distance education and language evolution and change* (pp. 242-257). Clevedon, UK: Multilingual Matters.

Moss, D., and Van Duzer, C. (1998). Project-based learning for adult English language learners. *ERIC Digest*. Washington, D.C: Center for Applied Linguistics (EDRS No. ED 427 556).

Muller-Hartmann, A. (2000). The role of tasks in promoting intercultural learning in electronic learning networks. *Language learning and technology*, 4(2): 129-147.

Mullins, P. (1992). *Successful English language learning strategies of students enrolled in the Faculty of Arts, Chulalongkorn University, Bangkok, Thailand*. Doctoral Dissertation, United States International University, San Diego, CA.

Murphy, J.M. (1991). Oral communication in TESOL: Integrating speaking, listening and pronunciation. *TESOL Quarterly*, 25(1): 51-75.

Murray, D.E., and McPherson, P (2004). *Using the web to support language learning*. AMEP Research Center, Sydney, Australia.

Nakatani, Y. (2010). Identifying strategies that facilitate EFL learners' oral communication: a classroom study using multiple data collection procedures. *The Modern Language Journal,* (94): 116-131.

Nunan, D. (1990). *Second language teaching & learning*. MA: Heinle & Heinle.

Nunan, D. (1992). *Collaborative language learning and teaching*. Cambridge: Cambridge University Press.

Nunan, D., and Bailey, K. M. (2009). *Exploring second language classroom research: A comprehensive guide.* MA: Heinle.

O'Malley, J. M., and Chamot, A. U. (1990). *Learning strategies in second language acquisition.* Cambridge: Cambridge University Press.

O'Malley, J. M., and Pierce, L. (1996). *Authentic assessment for English language learners: Practical approaches for teachers*. White Plains, NY: Addison-Wesley.

Oxford, R. L. (1990). *Language Learning Strategies: What Every Teacher Should Know*. Boston, MA: Heinle & Heinle Publishers.

Oxford, R. L., and Ehrman, M. E. (1995). Adults' language learning strategies in an interactive foreign language program in the United States. *System*, (23): 359-386.

Oxford, R. (2001). Language Learning Styles and Strategies. In M. Celce-Murcia(ed.), *Teaching English as a Second or Foreign Language*, pp. 359-366. MA: Heinle & Heinle.

Pan, C., and Sullivan, M. (2005). Promoting synchronous interaction in an eLearning environment. T.*H.E. Journal*, 33(2): 27-28, 30.

Paribakht, T. (1985). Strategic competence and language proficiency. *Applied Linguistics*, 6, 132-146.

Payne, J. S., and Whitney, P.J. (2002). Developing L2 oral proficiency through synchronous CMC: Output, Working Memory, and Interlanguage Development. *CALICO Journal*, 20(1): 7-32.

Pelletieri, J., 2000. Negotiation in cyberspace: the role of chatting in the development of grammaticalcompetence. In: Warschauer, M., Kern, R. (Eds.), *Network-based Language Teaching: Concepts and Practice* (pp. 59-86). Cambridge University Press: New York.

Perez, L.C. (2003). Foreign language productivity in synchronous versus asynchronous computer-mediated communication. *CALICO, 21*(1): 89-104.

Pica, T., Holliday, L., Lewis, N., and Morgenthaler, L. (1989). Comprehensible output as an outcome of linguistic demands on the learner. *Studies in Second Language Acquisition, 11*(1): 63–90.

Powers, D. E., Kim, H., Yu, F., Weng, V. Z., and Waverely, V. (2009). *The TOEIC Speaking and Writing Tests: relations to test-taker perceptions of proficiency in English*. [Online]. Available from: http://www.ets.org/Media/Research/pdf/RR-09-18.pdf [2010, March 21]

Promsiri, R., Prapphal, K., and Vichulata, B. (1996). A Survey of English Problems and Wants in Teacher Training of Upper-Secondary English Teachers in Government Secondary Schools in Educational Region 12. *PASAA*, (26): 80-88.

Purpura, J. (1997). An analysis of the relationships between test takers' cognitive and metacognitive strategy use and second language test performance. *Language Learning*, 42 (2): 289-325.

Resnick, M. (2002). Rethinking learning in the digital age. In G. Kirkman (Ed.), *The global information technology report: Readiness for the networked world.* New York: Oxford University Press.

Richards, J. C. (2005). *Communicative Language Teaching Today.* RELC Portfolio Series: 0219-6069: 13. Singapore: SEAMEO Regional Language Center.

Rita, S., David, L., and Sheryl, L. (2002). *The Michigan Corpus of Academic Spoken English.* English Language Institute, The University of Michigan, Ann Arbor, MI. USA.

Rivers, W. M. (1981). *Teaching Foreign Language Skills*. (2ed.) Chicago: University of Chicago Press.

Rivers, W. 1983. *Communicative Competence Approaches to Language Proficiency Assessment: Research and Application.* Clevedon, England: Multilingual Matters Ltd.

Roblyer, M. D. & Edward, J. (2000). *Integrating Educational Technology into Teaching*. (2ed.) NJ: Prentice Hall.

Rock, M., Gregg, M., Ellis, and Gable, R. (2008). REACH: A Framework for Differentiating Classroom Instruction. *Preventing School Failure*, 52 (2): 31-47.

Rosell-Aguilar, F. (2005). Task design for audiographic conferencing: Promoting

beginner oral interaction in distance language learning. *Computer Assisted Language Learning,* (18): 417-442.

Rubin, J. (1975). What the "good language learner" can teach us. *TESOL Quarterly*, 9 (1): 41-51.

Satar, H.M. & Ozderner, N. (2008). The effects of synchronous CMC on speaking proficiency and anxiety: Text versus Voice chat. *The Modern Language Journal,* (92): 596-613.

Savignon, S. (1972). *Communicative Competence: An Experiment in Foreign Language Teaching*. Philadelphia: Center of Curriculum Development.

Savignon, S. (1983). *Communicative Competence: Theory and Classroom Practice. Reading,* Mass.: Addison-Wesley.

Savignon, S. (1991). Communicative Language Teaching: The State of the Arts. *TESOL Quarterly,* 25 (2): 261-277.

Savignon, S. (2002). Communicative curriculum design for the 21st century. *English Teaching Forum,* January, 2-7.

Schegloff, E. A. (1968). Sequencing in conversational opening. *American Anthropologist*, (70): 1075-1095.

Schmidt, R. (1990). The role of consciousness in second language learning. *Applied Linguistics,* 11 (2): 129-159.

Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics,* (10): 209-241.

Siegel, S. (1956). Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill.

Silverman, D. (2006). *Interpreting Qualitative Data*. London: SAGE Publication.

Siritararatn, N. (2007). *A development of the english oral communication course using the project-based laerning approach to enhance english oral communication ability of Kasetsart University students*. Doctoral Dissertation. Chulalongkorn University. Bangkok.

Skehan, P. (1998). *A cognitive approach to learning language*. Oxford: Oxford University Press.

Skehan, P. (2009). Modelling Second Language Performance: Integrating Complexity, Accuracy, Fluency, and Lexis. *Applied Linguistics,* (30):510-532.

Slater, T., Beckett, G., and Aufderhaar, C. (2006). Assessing projects as second language and content learning. In G. H. Beckett & P. C. Miller (Eds.), *Project-Based Second and Foreign Language Education* (pp. 241-260). Connecticut: Information Age Publishing.

Smith, B. (2003). The use of communication strategies in computer-mediated communication. *System*, (31): 29-53.

Smith, B., and Gorsuch, G. (2004). Synchronous computer mediated communication captured by usability lab technologies: new interpretation. *System*, (32): 553-575.

Sternberg, R., Torff, B., and Grigorenko, E. (1998). Teaching triarchically improves student achievement. *Journal of Educational Psychology*, (90): 374-384.

Stoller, F. L. (1997). Project work: A means to promote language and content. *English Teaching Forum*, 35(4): 2-9, 37.

Stoller, F. (2006). Establishing a theoretical foundation for project-based learning in second and foreign language contexts. In G. H. Beckett & P. C. Miller (Eds.), *Project-based second and foreign language education: past, present, and future* (pp.19-40). Information Age Publishing: Connecticut.

Sudrung, J. (2004). *A development of the project-based process curriculum to enhance English language skills for upper secondary school students*. Unpublished Ph. D. dissertation, Chulalongkorn University.

Sullivan, N., and Pratt, E. (1996). A comparative study of two ESL writing environments: a computer-assisted classroom and a traditional oral classroom. *System*, 29 (4): 491-501.

Swain, M. (1985). Communicative competence: some roles of comprehensible input and comprehensive output in its development. In S.M. Gass & C. G. Madden (Eds.), *Input in Second Language Acquisition* (pp. 235-253). Boston, MA: Heinle & Heinle.

Tarone, E. (1977). Conscious Communication Strategies in Interlanguage: A Progress Report. In H.D. Brown, C.A. Yorio, & R.H. Ruth (Eds.), *TESOL'77 teaching and learning English as a second language*, Washington D.C.: TESOL, 194-203.

Tarone, E. (1980). Communication strategies, foreigner talk and repair in interlanguage. *Language Learning*, (30): 417-431.

Tarone, E. (1981). Some thoughts on the notion of communication strategy. *TESOL Quarterly*, 25 (2): 285-295.

Tarone, E., Cohen, A. D., and Dumas, G. (1983). A closer look at some interlanguage terminology: a framework for communication strategies. In C. Faerch & G. Kasper (Eds.) *Strategies in interlanguage communication*, pp. 4-14. London: Longman.

Tarone, E., Frauenfelder, U., and Selinker, L. (1976). Systematicity/ Variability and Stability/Instability in Interlanguage Systems. In H. D. Brown (Ed.), *Papers in Second Language Acquisition (Language Learning Special Issue No. 4*), pp. 93-134.

Tarone, E., and Yule, G. (1989). *Focus on the Language Learner: Approaches to identifying and meeting the needs of second language learners*. Oxford: Oxford University Press.

Tomlinson, C. A. (2000a). Differentiation of Instruction in the Elementary Grades. *ERIC Digest*. Champaigne, IL: ERIC Clearinghouse on Elementary and Early Childhood Education. (ERIC Document No. ED 443572). [Online]. Available from:http://www.eric.ed.gov/ERICDOCS/data/ericdoc2/content_storage_01/0 00000000b/80/2a/30/ef.pdf [2009, February 3]

Tomlinson, C. A. (2000b). Reconcilable differences: Standards-based teaching and differentiation. *Educational Leadership*, (58): 6-11.

Tomlinson, C. A., and Cooper, J. M. (2006). *Differentiating Instruction*. Houghton Mufflin: MA.

Toyoda, E. (2000). Arduous but exciting: Web-creation project in Japanese. *Computer Assisted Language Learning*, 13 (4-5): 441–448.

Tragoolsrid, V. (2002). *A proposed model of web-based instruction with project-based learning for team learning of students at King Mongkut's University of Technology Thonburi.* Doctoral Dissertaion. Chulalongkorn University. Bangkok.

Tsui, A. (1996). Reticence and anxiety in second language learning. In K. Bailey and D. Nunan (eds.), *Voices from the Language Classroom*. Cambridge: Cambridge University Press.

U.S. Department of Education. *Building the legacy: IDEA 2004*. [Online]. Available from: http://idea.ed.gov/explore/home [2008, March 15]

U.S. Department of Education. *No Child Left Behind Legislation and Policies.* [Online]. Available from: http://www2.ed.gov/policy/elsec/guid/states/index.html [2008, February 3]

van Lier, L. (1995). *Introducing language awareness.* London: Penquin English.

van Lier, L. (2000). From input to affordance: Social-interactive learning from an ecological perspective. In J. P. Lantolf (ed.), *Sociocultural Theory and Second Language Learning*. Oxford: Oxford University Press.

van Lier, L. (2008). Agency in the classroom. In J. P. Lantolf & M. E. Poehner (Eds.), *Sociocultural theory and the teaching of second languages*. London: Equinox Publishing.

Váradi, T. (1973). Strategies of target language learner communication: message adjustment. Paper presented at the *sixth conference of the Romanian-English Linguistics Project* in Timisoara.

Volle, L. M. (2005). Analyzing oral skills in voice e-mail and online interviews. *Language Learning & Technology*, 9 (3): 146-163.

Vygotsky, L. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.

Ward, N. (1994). *A connectionist language generator*. New Jersey: Ablex Publishing.

Warschauer, M. (1996). Comparing face to face and electronic communication in the second language classroom. *CALICO Journal*, (13): 7-25.

Warschauer, M. (1997). Computer-mediated collaborative learning: Theory and practice. *The Modern Language Journal*, (81): 470-480.

Warschauer, M. (2010). Digital divide. In Bates, M. J. & Maack, M. N. (Eds.), *Encyclopedia of library and information sciences*, Vol. 2, Third Edition (pp. 1551-1556). New York: CRC Press.

Warschauer, M., and Healey, D. (1998). Computers and language learning: An overview. *Language Teaching*, (31): 57-71.

Warschauer, M., and Kern, R. (2000). Introduction: Theory and practice of networked-based language teaching. In M. Warschauer & R. Kern (Eds.), *Network-based language teaching: Concepts and practice* (pp. 1-19). New York: Cambridge University Press.

Warschuauer, M., Shetzer, H., and Meloni, C. (2000). *Internet for English Teaching.* Virginia: Teaching English to Speakers of Other Language, Inc.

Willems, G. (1987). Communication strategies and their significance in foreign language teaching. *System*, (15): 351-364.

Wiriyachitra, A. (2002). *English language teaching and learning in Thailand in this decade.* ThaiTESOL Focus. [Online]. Available from: http://www.apecknowledgebank.org/resources/downloads/English%20Language%20Teaching%20and%20Learning%20in%20Thailand.pdf. [2008, August 8]

Wolcott, W. (1998). *An overview of writing assessment: Theory, research and practice*. Urbana, IL: National Council of Teachers of English.

Yamak, L. A. (2008). Student documentaries: A language learning tool. *English Teaching Forum*, (1): 20-27.

Yule, G., and Tarone, E. (1997). Investigating communication strategies in L2 reference: pros and cons, in G. Kapper and E. Kellerman (Eds) *Communication Strategies*, New York: Addison Wesley Longman.

Zimmerman, B. J., and Matinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal*, (23): 614-628.

APPENDICES

Appendix A: TOEIC Speaking Test Rubric

Questions	Tasks	Criteria	3	2	1	0
1-2	**Read a text aloud**	**Pronunciation**	Pronunciation is highly intelligible, though the production may include minor lapses and/or other language influence	Pronunciation is generally intelligible, though it includes some lapses and/or other language influence.	Pronunciation may be intelligible at times, but significant other language influence interferes with appropriate delivery of the text.	No response or response is completely unconnected to the stimulus.
		Intonation and Stress	Speaker's use of emphases, pauses, and rising and falling pitch is appropriate to the text.	Speaker's use of emphases, pauses and rising and falling pitch is generally appropriate to the text, though the response includes some lapses and/or moderate other language influence.	Speaker's use of emphases, pauses, and rising and falling pitch is not appropriate and the production includes significant other language influence.	No response or response is completely unconnected to the stimulus.
3	**Describe a picture** (criteria also include all above)	**Structure**	Speaker's use of structures allows coherent expression of ideas.	Speaker's use of structures may be limited and may interfere with overall comprehensibility.	Speaker's use of structures significantly interferes with comprehensibility.	No response or response is completely unconnected to the stimulus.
		Vocabulary	Speaker's vocabulary is appropriate to the question and word choice is accurate.	Speaker's vocabulary may be limited or somewhat inaccurate, although overall meaning is clear.	Speaker's vocabulary is inaccurate, or relies on repetition of the prompt.	No response or response is completely unconnected to the stimulus.
		Cohesion	Response addresses the task appropriately.	Response connected to the task, though meaning may be obscured at times.	Response does not address the task appropriately.	No response or response is completely unconnected to the stimulus.
4-6 **7-9** **10** **11**	**Respond to questions** **Respond to questions using information provided** **Propose a solution** **Express an opinion** (include all above)	**Relevance of content**	Response presents a clear progression of ideas and conveys the relevant information required by the tasks.	Response conveys some relevant information, but is clearly incomplete or inaccurate.	Response is a minimal reaction to the prompt or a misunderstanding of the prompt.	No response or response is completely unconnected to the stimulus.
		Completeness of content	Response includes appropriate detail, though it may have minor omissions.	Response attempts to address the prompt, but tasks or parts of tasks are neglected.	Response may show no awareness of the tasks in the prompt.	No response or response is completely unconnected to the stimulus.

183

Appendix B

Sample of Communication Strategy Inventory

Direction: How often do you use these communication strategies? Read the following statements and tick √ in the boxes below.

1 = Never 2 = Seldom 3 = Sometimes 4 = Often

Items	1	2	3	4
1. I leave a message unfinished when I am faced with some language difficulty. ขณะสนทนา ฉันทิ้งบทสนทนาค้างไว้เพราะมีปัญหาทางด้านภาษา				
2. I direct the conversation to familiar topics. ฉันเลือกที่จะพูดหัวข้อเรื่องที่ฉันคุ้นเคย				
3. I substitute the original message with a new one because of not feeling capable of executing it. ฉันเปลี่ยนเรื่องคุยเมื่อรู้สึกตัวว่าไม่สามารถคิดคำพูดเป็นภาษาอังกฤษได้				
4. I simplify my expressions when my conversational partner seems to be confused. ฉันใช้คำศัพท์ที่ง่ายขึ้นเมื่อคู่สนทนาไม่เข้าใจที่ฉันพูด				
5. I use an alternative term which expresses the meaning of the word I cannot remember as closely as possible. ฉันใช้คำอื่นที่มีความหมายใกล้เคียงเมื่อฉันไม่รู้คำศัพท์คำนั้นในภาษาอังกฤษ				

Adapted from Tarone (1977), Corder (1983), Faerch & Kasper (1983), Bialystok (1983), Paribakt (1985),Willems (1987), Dörnyei & Scott (1997), Cohen & Dörnyei (2002).

Appendix C

Communication Strategy Categories, definitions, and examples from audioblogs and voice chats

Speakers

Strategies	Definitions	Examples from Audioblogs	Examples from Voice chats
1. Compensatory			
1.1 Circumlocution	The speaker described the target word he or she did not know.	"the polar bear has nowhere to sleep, nowhere to live, *no house*." (habitat)	"it's kinda like *the sea which is freezing*." (glacier)
1.2 Approximation	The *speaker* used an alternative term for the unknown word.	"I have many dogs. I have bunny. I have *rats*…oh no… not the rat in the market or on the roads." (guinea pigs)	"*it's a high rock.*" (a pile of spiky-shaped rocks)
1.3 All-purpose word	The *speaker* used an alternative term which expressed the meaning of the word they did not know.	"there a::re four *things* to consider for the assessment." (components)	"The global warming has *done something with* this mountains." (affected)

1.4 Use of L1	The *speaker* used the native language	NA	*"like esan ban rao." (the northern part of Thailand)*
2. Time-gaining			
2.1 Fillers	a sound or word that used to fill up gap in an utterance	"many movies *um* talks about *uh* global warming…."	*"Uh…," "something like that."*
2.2 Sound-lengthening	the *speaker's* lengthened sound	"*A::nd* I'm going to talk about *the::* topic related to green project."	"*Ah:::* I think the first picture for me is somewhere in the dessert."
2.3 Long pauses	a gap the *speaker* made within utterances one to ten seconds	"Some certain texture of clothes that can help *(3.0)* the global warning…"	"My D picture, *(2.0)* I can't describe it. I don't know what it is."
2.4 Repetitions	the *speaker*'s repeated a word or a phrase with no intention to emphasize it	"*it's* uh *it's* not very much or not a lot of topics or idea *for this* uh *for this* criteria."	*"it's it's it's* very sad."

3. Emphasis			
3.1 High volume/ stress	the *speaker* wanted to emphasize a word or phrase by speaking the particular word or phrase louder.	"I am a *MAN*. So it is a pricing if I choose to do the project about how to flirt a girl and also support the idea of global warming."	"*REALLY?*"
3.2 Minor pauses	a tiny gap (less than one second) occurring within a longer string of utterances for emphasizing the word or phrase preceding it.	"I have to tell you that I'm not a kind of environmental person (.) but I DO (.) concern about this topic."	"My A picture match with your (.) number (.) two."
4.Avoidance			
4.1 Message abandonment	the *speaker* left the message unfinished**.**	*"If we….if this….*because this is a big project."	*"I have, I also have…."*

4.2 Message replacement (self-correct)	the *speaker* substituted the original message with a new one	"suggesting the new idea of how people *can help…can do* something about this problem*."*	*"it's like u::h there's a man."*
		"But the green tourism will help tourist to realize the importance of some of these u:::m *preserva uh conservation."*	"*there is uh:: there are* four pictures." (self-correction —replacing the wrong form with a correct one)
5.Interactional strategies			
5.1 Show/check understanding -Comprehension check	the *speaker* checked his or her interlocutor's comprehension to prevent communication breakdown	NA	*"Can you follow my description?"*

	5.2 Ask for/ offer help – Appeal for help	the *speaker* appealed to his or her interlocutor that he or she had a problem thinking of the right word	NA	*"What do I call?,"* and *"I don't know how to explain."*
	- Spelling	the *speaker* spelled out the word that might be problematic for the interlocutor	NA	*"D..U..L..L.. DULL weather."*
Interlocutors	5.3 Show/ check understanding - Backchannel	a brief utterance with marked intonation contours (O'Connor and Arnold, 1973, in van Lier and Matsuo, 2000). The *interlocutor* backchannels to show his or her understanding and agreement on the topic discussed	NA	*"Ah ha,"* and *" Yeah."*

- Echoic backchannel	the *interlocutor* repeated the speaker's previous words or phrases.	NA	VO2: ……..they were in line. VO7: in line?
- Clarification request	the *interlocutor* attempted to draw clarification from the speaker's previous utterances	NA	"*I'm so confused right now," and "What is glacier?"*,
- Confirmation check	the *speaker* requested confirmation that he or she had heard or understood something correctly	NA	*"Oh, really?*"
5.4 Ask for/offer help - Guessing	the *interlocutor* tried to guess the word when the speaker showed sign of incapability of finishing the speech	NA	VO 6: And next next to this is like the::: lake o::r (.) lake or something the upper= VO2: =sky. right?=
- Interpretive summary	the interlocutor paraphrased the speaker's message to check whether he or she understood it correctly	NA	"So your picture is before, and mine is after."

Appendix D
Semi-Structured Interview Questions

1. How did you feel about this course (in general)?
2. How did your English improve while doing the project work?
3. How did the technology used in the project work help you to learn English?
4. What are the difficulties you faced when completing the project?
5. What are the pros and cons of having the classroom atmosphere that incorporates DCP?
6. What are the three words (adjectives) you would use to describe this course?
7. What was the best thing you learned from this course?
8. What do you like least about this course?
9. What would you do to make this course more interesting and worthwhile for all learners?

Appendix E

Project Work Assessment Rubric

Criteria	Exceptional(3)	Admirable(2)	Amateur(1)
Non-Language Criteria (Audio-Visual Production)			
Content	Covers topic in-depth with details and examples. Subject knowledge is excellent.	Includes essential knowledge about the topic. Subject knowledge appears to be good.	Includes essential information about the topic but there are 1-2 factual errors.
Organization	Presentation is clear, logical and organized. The audience can follow line of reasoning.	Presentation is generally clear and well organized. A few minor points may be confusing.	Concept and ideas are loosely connected; lacks clear transition; flow and organization are choppy.
Attractiveness	Makes excellent use of font, color, graphics, effects, etc. to enhance the presentation. Ideas are creative and inventive.	Makes good use of font, color, graphics, effects, etc. to enhance the presentation. Work shows some original thought.	Makes use of font, color, graphics, effects, etc. but detract from the presentation content. Little evidence of original thinking
Synthesis of Materials	Use of multiple resources to support the presentation.	Use of resources not as varied and not well connected .	Little variation in material presented.
Language Criteria (Oral Production)			
Pronunciation	Pronunciation is highly intelligible, though the production may include minor lapses and/or other language influence	Pronunciation is generally intelligible, though it includes some lapses and/or other language influence.	Pronunciation may be intelligible at times, but significant other language influence interferes with appropriate delivery of the text.
Intonation and Stress	Speaker's use of emphases, pauses, and rising and falling pitch is appropriate to the text.	Speaker's use of emphases, pauses and rising and falling pitch is generally appropriate to the text, though the response includes some lapses and/or moderate other language influence.	Speaker's use of emphases, pauses, and rising and falling pitch is not appropriate and the production includes significant other language influence.
Structure	Grammar and usage almost entirely correct. Only minor mistakes are detected.	Grammar and usage usually correct with occasionally errors that obscure meaning.	Frequent errors in grammar and usage and word orders that interfere with meaning.
Vocabulary	Speaker's vocabulary is appropriate and word choice is accurate.	Speaker's vocabulary may be limited or somewhat inaccurate, although overall meaning is clear.	Speaker's vocabulary is inaccurate.

Adapted from Debski (2006), Kayser (2002), Yamak (2008) and ETS (2007).

Appendix F
A sample of the instructional manual

I. Rationale

English is considered to be one of the most important subjects taught at school in Thailand. It is a tool for communication as well as a device to enable learners to increase their knowledge of the world (Promsiri, Prapphal and Vijchulata, 1996). Learners who are proficient in English language will gain better opportunities in life, education and work. However, the study shows that overall English proficiency of Thai university students is low when compared with those from neighboring countries such as Malaysia, Singapore and the Philippines, especially in listening and speaking skills (Wiriyachitra, 2002). Rivers (1981) mentions that speaking is used twice as much as reading and writing outside the classroom. Unfortunately, speaking skill is not the focus of Thai tertiary education (Wiriyachitra, 2002) and it is recognized as the weakest skills of Thai students because of an interference from the mother tongue (Thai), a lack of opportunity to speak English in daily life, shyness to speak English with classmates (Biyaem, 1997), unchallenging English lessons, and being passive learners (Wiriyachitra, 2002). To help Thai students survive in this competitive world, changes have to be done in the classroom to help promote students' speaking or oral communication ability.

II. Theoretical frameworks

To develop a framework of DCP, related theories were explored from textbooks, journal articles and research papers. The theories reviewed for the study include the Differentiated Instruction, Computer-Mediated Communication and Project Work which are summarized as follows:

1. Differentiated Instruction

Differentiated instruction derives from the need of teachers to ensure that all students with different abilities will accomplish in their learning. It is based on four guiding principles which focus on essential idea in the course

content, responsiveness to individual students' differences, an integration of assessment and instruction and an ongoing adjustment of content, process and products to meet individual students' levels of prior knowledge and way of thinking (Rock et al., 2008). Tomlinson (2006) proposes that variance of learner, a classroom environment, curriculum and teaching method should be considered when planning a differentiating lesson. It is important that teachers recognize their students' differences on readiness to learn, interest and personal profile which includes learning style, gender, cultural and intelligence preference. Beside this, the classroom environment is also important. Teachers should create a learning environment that makes students feel accepted or appreciated and at the same time is challenging for developing their strengths. Furthermore, the curriculum should be focused, engaging and challenging. Finally, the method of teaching should be varied. Teachers should realize learner variance and aim to develop multiple routes for teaching and learning to help students achieve the goals. In addition, Rock et al. (2008) suggest that assessment is also an essential part of differentiated instruction. It should not be a traditional method of using multiple choice tests to evaluate students' learning. Instead, an assessment should be an ongoing process that takes place at different stages of an instruction: before, during and after.

2. Computer-mediated communication

Computer-mediated communication (CMC) is "communication that takes place between human beings via the instrumentality of computers" (Herring, 1996, p. 1). It benefits language learning in many ways. Beauvois (1997), Chun (1998) and Warschauer (1996) found that CMC helps create less stressful environment for second language learning. Besides, Chun (1994) and Sullivan & Pratt (1996) state that it provides more equal participation than face-to-face interaction by allowing shy and less motivated students to participate in the exchanges. Furthermore, CMC also increases output from more learner participation in the exchange (Beauvois, 1997; Kelm, 1992; Kern, 1995; Kim, 2000; Warschauer, 1996). Finally, CMC users perform syntactically more

complex and morphologically more accurate language (Chun, 1994; Kelm, 1992; Kern, 1995; Warschauer, 1996). It is evident that CMC facilitates comprehensible input and output, promote negotiation of meaning through online interaction and improves learners' linguistic features as they interact with more competent language users.

Nevertheless, this interaction would be worthless if learners are not engaged in a meaningful task. The project work is then integrated into this study.

3. Project work

Project work is an instructional approach that engages learners with meaningful and authentic tasks which help promote student-centeredness, learner autonomy, collaborative learning, creative thinking and creativity. Its unique characteristic is that specific language aims are not prescribed, but all skills and content knowledge are enhanced while learners completing an end product. This approach is based on Dewey and Kilpatrick's Constructionism and Vygotsky's Social Constructivism. The heart of project work is the determination of the teacher to engage students in a 'binding communicative activity' (Barson, 1997, p.4) having a final project (product) as a stimulant for creative energy and contextualized language use and learning.

With a combination of the Differentiated Speaking Instruction, Computer-Mediation Communication and Project work (DCP), students should be more motivated to speak English. Through Differentiated Speaking Instruction, students' learning will be closely supported. In CMC environment incorporated with Project Work, students should be engaged in meaningful interactions that will help them enhance their English speaking proficiency.

III. Teacher's role

The teacher acts as an instructional facilitator and coach who guides, consults, and provides feedback to students. In a student-centered learning environment such as this, teachers no longer dominate the class. The teacher should even learn with or from their students. The teacher's active role should

be observed in the class preparation process that he or she effectively designs activities that enable students to master complex skills to construct knowledge. Besides, as this approach requires technical skill, the teacher does not have to be technological expert but must be confident in using technology and in supporting students' use of technology.

Appendix G

Sample Unit and Lesson Plan

Unit 2: The Green Project

Lesson 2.2: Familiarize with CMC (1)

Objectives: After completing this unit, the students will be able to;

1. Describe pictures with appropriate details, explain something to someone and ask someone to repeat something.
2. Produce intelligible pronunciation with an appropriate placement of sentence stress.
3. Effectively discuss with a partner via voice chat on environmental problems.

Materials:

1. Power Point slides on "The 11th Hour" video clips from Youtube.
2. Pictures of nature affected by global warming.
3. PPT on how to explain something to someone and ask someone to repeat something, sentence stress, Yahoo Messenger voice chat.
4. Pictures of the melting Arctic Ocean.
5. "Before and After" handout.

Time: 2 hours

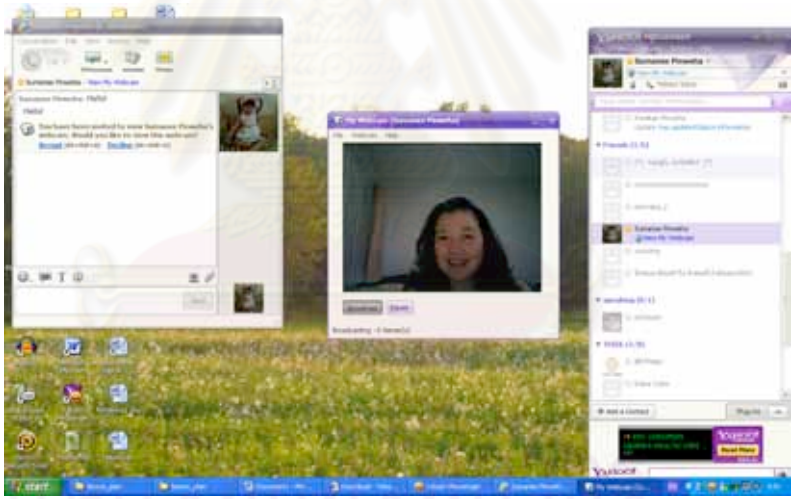
Lesson Plan

Units/Topics	Procedures	Material Aids
Unit 2: The Green Project **Lesson 2.2: Familiarize with CMC (1)**	**Warm-up activity** • Show the students " The 11th Hour" movie trailer and ask them how they feel about the environmental problems.  	1. "The 11th Hour" video clips from Youtube.

198

	• Show the students different pictures of the nature affected by the global warming.   **Activity 1: Introduction** • Declare to students that the today's activity will be meaningful to them. • They are to play a game by matching the pictures they have to the ones that their friends have via voice chat (introduced in the previous week). • Perform "**Building up the board**" activity to elicit from the students how they	2. Pictures of nature affected by the global warming. 3. PPT on list of language support unit.

	would say in English when describing pictures, explaining something, asking someone to repeat something and how much they know about sentence stress and voice chat. **Activity 2: Presentation** • Make a conclusion from students' answers by showing useful formulaic expressions for describing pictures, explaining something and asking someone to repeat something.  	4. PPT on how to explain something to someone and ask someone to repeat something.

	• Students practice using such expressions in pairs by giving each pair four pictures of before and after the melt-down (face-to-face). • Students take turn describing the picture they pick to the partner (face-to-face). • Introduce the students how to place a proper sentence stress when making utterances. • Review the use of voice chat (introduced on the previous week). 	5. Pictures of the melting Arctic Ocean. 6. PPT on sentence stress. 7. PPT on voice chat.

	Activity 3: Practice • Distribute each student a “Before or After” handout. • Show the students how to perform the task. (Modelling) • Perform **“Information gap”** activity by having students work in pair (randomly assigned by the instructor) discussing about pictures they have in the handout and match them with the pictures that their friends have. (Same scenes but taken at different periods.**)** • Let the students discuss with their partners via voice chat and have them record the talk.	8. “Before or After”handout.

	Activity 4: Extension • Ask students to search for more pictures concerning global warming that they think the most serious from the Internet and show the pictures to the class. The one who shows the most “shocking” or “impressive” picture will be rewarded.	

203

Appendix H

Sample Material

Before or After?

Look at the pictures below and discuss with your partner whether they were taken before or after the melt-down. Then match them with the other 4 pictures that your partner has.

A

B

C

D

BIOGRAPHY

Sumanee Pinweha received her Bachelor's Degree in Education from the Faculty of Education, Chulalongkorn University and an M.A. in English for Careers, Language Institute, Thammasat University. Her research interests include English oral communication and pronunciation, computer-mediated communication, project-based instruction, and communication strategies.

Academic Presentations:

Pinweha, S. (April, 2011). *Differentiated Speaking Instruction via CMC for Thai Learners.* Poster session presented at The Annual 45th IATEFL Conference and Exhibition, Brighton, UK.

Pinweha, S. (November, 2010). *Differentiated Instruction via Computer-Mediated Oral Communication for Thai Learners.* Paper presented at CATESOL Northern Regional Conference, Monterey Institute of International Studies, CA, U. S. A.

Pinweha, S. (January, 2010). *Differentiated Speaking Instruction: CMC and Project Work*. Paper presented at The Annual 30th Thailand TESOL, Bangkok, Thailand.

Working Experience:

2008-Present	Visiting Professor School of Aviation Business Management Mae Fah Luang University, Chiang Rai
2007-Present	Visiting Professor Faculty of Education, Chulalongkorn University
Sep - Dec 2011	Visiting Scholar Monterey Institute of International Studies, California, U.S. A
2005-2008	Instructor Language and Culture Institute, Thai Airways International
1996-1997	Instructor Thongsook College, Bangkok