

A DEVELOPMENT OF A CONTENT AND LANGUAGE INTEGRATED LEARNING (CLIL)
COURSE TO ENHANCE ENGLISH LANGUAGE ABILITIES, AGRICULTURAL CONTENT,
AND CULTURAL KNOWLEDGE OF UNDERGRADUATE STUDENTS

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บทคัดย่อและแฟ้มข้อมูลฉบับเต็มของวิทยานิพนธ์ตั้งแต่ปีการศึกษา 2554 ที่ให้บริการในคลังปัญญาจุฬาฯ (CUIR)
เป็นแฟ้มข้อมูลของนิสิตเจ้าของวิทยานิพนธ์ ที่ส่งผ่านทางบัณฑิตวิทยาลัย

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are the thesis authors' files submitted through the University Graduate School.

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 2015

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การพัฒนารายวิชาโดยยึดหลักการเรียนตามแนวบูรณาการเนื้อหาและภาษาเพื่อพัฒนาความสามารถ
ทางภาษาอังกฤษ ความรู้เนื้อหาและวัฒนธรรมการเกษตรของนักศึกษาระดับปริญญาตรี



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรดุษฎีบัณฑิต

สาขาวิชาภาษาอังกฤษเป็นภาษานานาชาติ (สหสาขาวิชา)

บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2558

ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Thesis Title A DEVELOPMENT OF A CONTENT AND LANGUAGE
INTEGRATED LEARNING (CLIL) COURSE TO
ENHANCE ENGLISH LANGUAGE ABILITIES,
AGRICULTURAL CONTENT, AND CULTURAL
KNOWLEDGE OF UNDERGRADUATE STUDENTS

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จาริณี จันทร์ศรี : การพัฒนารายวิชาโดยยึดหลักการเรียนตามแนวบูรณาการเนื้อหาและภาษาเพื่อพัฒนาความสามารถทางภาษาอังกฤษ ความรู้เนื้อหาและวัฒนธรรมการเกษตรของนักศึกษาระดับปริญญาตรี (A DEVELOPMENT OF A CONTENT AND LANGUAGE INTEGRATED LEARNING (CLIL) COURSE TO ENHANCE ENGLISH LANGUAGE ABILITIES, AGRICULTURAL CONTENT, AND CULTURAL KNOWLEDGE OF UNDERGRADUATE STUDENTS) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: รศ. ดร. ปัญชลี วาสนสมสิทธิ์, 348 หน้า.

งานวิจัยนี้เป็นการพัฒนารายวิชาโดยยึดหลักการเรียนตามแนวบูรณาการเนื้อหาและภาษาเพื่อพัฒนาความสามารถทางภาษาอังกฤษ เนื้อหาด้านการเกษตรและความรู้ทางวัฒนธรรมของนักศึกษาระดับปริญญาตรี วัตถุประสงค์หลักของงานวิจัยนี้ คือ เพื่อศึกษาขอบเขตที่ว่ารายวิชาซึ่งยึดหลักการเรียนตามแนวบูรณาการเนื้อหาและภาษาสามารถพัฒนาความสามารถทางภาษาอังกฤษ เนื้อหาด้านการเกษตรและความรู้ทางวัฒนธรรมของนักศึกษาระดับปริญญาตรีและเพื่อสำรวจความคิดเห็นของนักศึกษาระดับปริญญาตรีที่มีต่อรายวิชาดังกล่าว

งานวิจัยนี้ดำเนินการทดลองตามแบบแผนการทดลองแบบกลุ่มเดียวทดสอบก่อนเรียนและหลังเรียน กลุ่มตัวอย่างในการวิจัยคือนักศึกษาระดับปริญญาตรี คณะเทคโนโลยีการเกษตร สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหาร ลาดกระบัง จำนวน 27 คน ซึ่งลงทะเบียนเรียนรายวิชาภาษาอังกฤษเชิงวิชาการ

เครื่องมือที่ใช้ในการวิจัยครั้งนี้ประกอบไปด้วย 1) รายวิชาซึ่งยึดหลักการเรียนตามแนวบูรณาการเนื้อหาและภาษา ซึ่งประกอบด้วยบทเรียนหกบท 2) แบบทดสอบรายวิชาซึ่งยึดหลักการเรียนตามแนวบูรณาการเนื้อหาและภาษาซึ่งแบ่งออกเป็นสี่ตอน ได้แก่ แบบทดสอบด้านการอ่าน แบบทดสอบด้านการเขียน แบบทดสอบเนื้อหาด้านการเกษตร และแบบทดสอบด้วยความรู้ทางวัฒนธรรม 3) แบบสอบถามความคิดเห็นของนักศึกษาที่มีต่อรายวิชา และ 4) แบบสัมภาษณ์ความคิดเห็นของนักศึกษาที่มีต่อรายวิชา

ภายหลังการทดลองดำเนินการสอนตามแนวการสอนดังกล่าวเป็นเวลา 12 สัปดาห์ คะแนนจากแบบทดสอบหลังเรียนของนักศึกษาเพิ่มขึ้นอย่างมีนัยสำคัญทางสถิติ ($p < 0.05$) ทั้งในด้านความสามารถทางภาษาอังกฤษ เนื้อหาด้านการเกษตร และความรู้ทางวัฒนธรรม นอกจากนี้ผลการวิจัยยังระบุว่ามีนักศึกษามีความคิดเห็นในเชิงบวกต่อรายวิชาฯ จากผลการศึกษาวิจัยในครั้งนี้ สามารถสรุปได้ว่ารายวิชานี้สามารถช่วยเพิ่มพูนความสามารถทางภาษาอังกฤษ เนื้อหาด้านการเกษตร และความรู้ทางวัฒนธรรมของนักศึกษาระดับปริญญาตรี ดังนั้น จึงควรมีการพัฒนาวิชาซึ่งยึดหลักการเรียนตามแนวบูรณาการเนื้อหาและภาษามากยิ่งขึ้น

สาขาวิชา ภาษาอังกฤษเป็นภาษานานาชาติ

ปีการศึกษา 2558

ลายมือชื่อนิสิต

ลายมือชื่อ อ.ที่ปรึกษาหลัก

5387760320 : MAJOR ENGLISH AS AN INTERNATIONAL LANGUAGE

KEYWORDS: CONTENT AND LANGUAGE INTEGRATED LEARNING, ENGLISH LANGUAGE ABILITIES, AGRICULTURAL CONTENT, CULTURAL KNOWLEDGE, UNDERGRADUATE STUDENTS

CHARINEE CHANSRI: A DEVELOPMENT OF A CONTENT AND LANGUAGE INTEGRATED LEARNING (CLIL) COURSE TO ENHANCE ENGLISH LANGUAGE ABILITIES, AGRICULTURAL CONTENT, AND CULTURAL KNOWLEDGE OF UNDERGRADUATE STUDENTS. ADVISOR: ASSOC. PROF. PUNCHALEE WASANASOMSITHI, Ph.D., 348 pp.

This research involved the development of a Content and Language Integrated Learning (CLIL) course to enhance English language abilities, agricultural content, and cultural knowledge of undergraduate students. The main objectives of this study were to investigate the extent to which the CLIL course improved English language abilities, agricultural content, and cultural knowledge of undergraduate students, as well as to explore the opinions of undergraduate students toward the developed CLIL course.

This research study employed a one-group pretest-posttest design. The sample consisted of 27 undergraduate students from the Faculty of Agricultural Technology, at King Mongkut's Institute of Technology Ladkrabang, who were enrolled in the English for Academic Purposes course.

The instruments used in the present study were namely 1) the CLIL course consisting of six units, 2) the CLIL test which contained the four sub-parts in reading, writing, agricultural content, and cultural knowledge, 3) the opinion questionnaire, and 4) the CLIL course interview protocol.

After the 12-week CLIL implementation, the post-test mean scores revealed that that the students' English language abilities in both reading and writing, agricultural content, and cultural knowledge improved with statistical significance ($p < 0.05$). The findings also indicated that the students had positive opinions toward the course. Based on the findings of the study, it is could be concluded that the CLIL course could enhance English language abilities, agricultural content, and cultural knowledge of undergraduate students. Therefore, it is recommended that more CLIL courses should be developed.

Field of Study: English as an International
Language

Student's Signature

Advisor's Signature

Academic Year: 2015

ACKNOWLEDGEMENTS

Firstly, I would like to express my deepest gratitude to my advisor, Assoc. Prof. Dr. Punchalee Wasanasomsithi, for her patient guidance, useful critiques, and continuous support of my Ph.D. studies. Besides, I wish to thank my dissertation committee members, Assoc. Prof. Dr. Supanee Chinawong, Asst. Prof. Dr. Apasara Chinwonno, Asst. Prof. Dr. Jirada Wudthayagorn, and Assoc. Prof. Dr. Piyatida Changpueng for their insightful comments and suggestions that helped make this research complete.

My sincere thankfulness is extended to the experts involved in the validation of the research instruments. Their opinions and recommendations I received led to significance revision and improvement of instruments to ensure validity and reliability of the gathered findings. My appreciation also goes to Ajarn Tanassanee Jitpanich for her help—offering to mark the students' writing as another rater.

I am profoundly indebted to all of the participants who voluntarily participated in both of the two phases of my study. The completion of this research would not have been possible without their participation.

I would also like to express my heartfelt gratitude to the Higher Education Research Promotion (HERP), under the Office of the Higher Education Commission (OHEC), for their financial support. My thanks also go to all my beloved colleagues at the Department of Liberal Arts, the Faculty of Agricultural Technology, King Mongkut's Institute of Technology Ladkrabang, for their continuous assistance throughout my doctoral studies.

Special thanks go to my EIL colleagues who have been with me through good and bad times, particularly Atinuch Pin-ngern and Thidawan Tunskul. My work would not have been accomplished if they had not been there for me when I needed them.

Last but not least, I would like to dedicate this dissertation to my parents who have shown me unconditional love and unwavering support. Without them, I would never have completed this journey. My wholehearted thanks also go to Na Aew, my beloved auntie, and Pook, my dear brother, for their encouragement as well as assistance throughout my doctoral studies.

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Chapter 1

Introduction

1.1 Background of the Study

Nowadays English has been spoken by not only a large number of native speakers, but also a large number of those who use it as a second language (such as those living in India, Bangladesh, Nigeria, and Singapore) or a foreign language (such as those in China, Japan, and Thailand). The global spread of English has thus signified its role as an international language or a World Language (Jenkins, 2005) and as a lingua franca among those who do not share the same native language (Kirkpatrick, 2010). Needless to say, English has become the language of international communication and has acquired the widespread use in various domains such as business, technology, education, entertainment, and personal domains.

In Thailand where English is considered a foreign language, English has been widely used as a lingua franca in various domains such as in international relations as well as in business and the media (Baker, 2008). Consequently, an emphasis has been placed on English learning and teaching at every level of education nationwide. To be specific, English has been made a compulsory foreign language subject in

school as well as in higher education, and that is why it has become the most popular foreign language learners selected in school (Baker, 2008).

Furthermore, according to Thai Higher Education: Policy and Issue (Office of Higher Education Commission, 2012), as a member of ASEAN, it is imperative that Thailand make outstanding contribution to the peace and prosperity of the region and participate in the regional integration for the ASEAN Community. To fulfill such goals, education plays a vital role to promote human resources development to cope with mobility of students and labor force among member countries of ASEAN. In order to help equip Thai students with essential skills required by the international marketplace, the English language is one of the keywords. According to Article 34 of Charter of the Association of Southeast Asian Nations (ASEAN Secretariat, 2008), English is the working language of ASEAN. Consequently, mastery in English helps provide Thai students an opportunity to be well-prepared for higher education harmonization in Southeast Asia as well as for job mobility in the ASEAN Community.

Due to the significance of English, it is a major responsibility of English language teachers to help Thai students develop their English language skills in order to become proficient users of the language. Among the four skills of English, reading is one of the skills that not only increase life skills and knowledge, but also

determine how people think and develop their imagination (Harrison, 2004). That is, reading helps Thai students gain exposure to the target language by providing them with more or less understanding of the language. According to Harmer (1998), some of the language they read has been imprinted on their minds as part of the language acquisition process. In addition, reading texts provides opportunities to study many language aspects, such as vocabulary, and the way sentences, paragraphs, and texts are formed. Reading can also bring about imaginative responses and discussions, which are a good basis for further studies of any subjects.

In spite of the significance of reading, reading should not be promoted separately from other skills. When it comes to teaching and assessing reading, thinking processes or what Bloom (1956) and Anderson, Krathwohl, and Bloom (2001) call 'cognitive processes' play an important role. That is to say, in order to investigate the degree to which students have developed their reading skill, the levels of thinking, such as the ability to understand, apply, or analyze, have to be explored as well. Therefore, in several language classes, reading and thinking skills have been promoted simultaneously.

In addition to thinking, writing is associated with reading. Olson (2003) has pointed out that reading and writing are interconnected since they are processes that

complement each other and involve the use of similar cognitive strategies such as planning and goal setting, tapping prior knowledge, and asking questions and making predictions as a way to construct meaning. Besides, reading and writing help improve each other. On the one hand, when reading, according to Harmer (1998), students can develop their writing skills by using reading as good models for writing. That is why people who read more can have a more effective writing style (Krashen, 2004). On the other hand, when writing, students have to pay attention to accurate language use (Harmer, 2004), and this may provoke their ability in reading. From the scholars' views mentioned above, it can be clearly seen that reading and writing are interwoven. Hence, it will be highly beneficial for language learners if both of the skills are simultaneously developed.

In spite of the significance of reading and writing, a number of students have failed to become a successful English language reader and writer. Many research studies have reported on low English language proficiency of the students in the realm of reading and writing. Prapphal and Opanon-Amata (2002), to begin with, have reported that the majority of Thai students who took the Chulalongkorn University Test of English Proficiency (CU-TEP) scored below 500 in the test's reading part, as equalized with the paper-based TOEFL score. Likewise, according to Wongsothorn

(1993), English reading and writing skills of Thai university students were found to be at a fairly poor level. Similarly, in other countries, for students with different mother tongues, based on Test and Score Data Summary for TOEFL Internet-based and Paper-based Tests: January 2010 - December 2010 Test Data (Educational Testing Service, 2011), the undergraduate test takers scored the lowest in the reading part in both the Internet-based and the paper-based tests. Besides, in comparison with the reading part, although the undergraduate test takers performed better in the writing part, they scored under 70%, which cannot be considered quite satisfactory.

English for Specific Purposes (ESP) students also experience reading and writing problems. Chaisuriya (2006), for instance, has found that English reading problems of graduate Business students ranked from a moderate to high level. Besides, Pawapatcharandom (2007) has revealed that the English problem Thai students in the Faculty of Applied Science at Mahidol University perceived as most serious was writing. The main problems in writing included inability to write an essay within an allocated time, to write an English academic paper, to accurately apply grammatical rules when writing any kind of papers, and to use an appropriate structure for the content. Apart from writing skills, reading skills were found in this research study as one of the other problems the participants encountered. The

major problems in reading the participants experienced were as follows: inability to understand English idioms, to read English academic textbooks, to explain the main idea and summarize English texts, and to guess the meaning of new vocabulary.

Similarly, at King Mongkut's Institute of Technology Ladkrabang, Agricultural Technology students have difficulty in reading and writing in English. Despite the fact that the students are required to take two compulsory courses, Foundation English 1 and Foundation English 2, which place an emphasis on practices in the use of the four language skills, including reading and writing, their average score of the academic year 2011 in Foundation English 2 and that of the academic year 2012 in Foundation English 1 were 39.55% (Department of Liberal Arts, 2554) and 39.61% (Department of Liberal Arts, 2555b), respectively. Furthermore, the students' average score of the academic year 2012 in the English for Academic Purposes (EAP) course was 63.11% (Department of Liberal Arts, 2555a). It is clear that such scores could not be considered satisfactory.

In order to help students enrolled in the EAP course overcome their difficulty in reading and writing, it is significant to explore the nature of the course as well as the teaching approach which has been applied in the course. The English for Academic Purposes (EAP) course is an elective ESP course, included in the

Agricultural Technology Curriculum. It is offered to help students develop their English language skills with an emphasis on reading texts related to students' major fields of studies such as language use for describing processes and causes and effects, etc. The theme-based approach is being currently used. That is, the instructors of the course generally conceptualize the content according to the themes/topics in the agricultural contexts, such as plant parts, soil erosion, and aquaculture. In addition, the instructors of the course conceptualize the content by having the syllabus organized around reading skills. To illustrate, a reading passage is provided to students in each unit, and students are supposed to predict the content, understand the main idea, and interpret the text. In addition to reading, in some units, students are asked to produce their writing to describe processes or causes and effects in accordance with the unit objectives.

Although the theme-based approach provides students an opportunity to be familiarized with some agricultural topics as well as to practice both reading and writing, as previously mentioned, the students' average score of the academic year 2012 in the English for Academic Purposes (EAP) course reflected students' failure to achieve the desired objectives of the course. As such, the current instructional method of effective and another teaching approach may have to be explored.

Among a wide range of teaching approaches, the Content and Language Integrated Learning (CLIL) Approach seems more promising. According to Coyle, Hood, and Marsh (2010, p. 1), CLIL is “a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language.” As quoted, it can be seen that the two main foci of the approach are content and language, which should provide students opportunities to acquire both the subject matters and the target language at the same time. This key characteristic of CLIL may seem to make it indistinguishable from the theme-based approach which emphasizes acquisition of the subject matters and the language simultaneously. However, unlike the theme-based approach, apart from content and language, CLIL also integrates the other two components, namely, cognition and culture, in its teaching and learning practice (Coyle et al., 2010). That is to say, in addition to content and language, according to several advocates such as Cottrell (2005) and Moseley et al. (2005), CLIL highlights cognition—cognitive or thinking skills which drive the process of learning and teaching and are believed by several scholars to be a good basis for learning many subject disciplines, including language. The approach also emphasizes culture— intercultural awareness which includes acquiring the knowledge about ways of life in terms of self and others, which is specifically

associated with the subject matters taught in CLIL. As a result of the role of the ‘cognition’ and ‘culture’ as previously mentioned, the approach may yield students’ deeper understanding in the content knowledge as well as more satisfactory progress in the target language.

When considering the four components of CLIL, it can be seen that CLIL seems to be appropriate for population in the English for Academic Purposes (EAP) course. This is because the two foci of the approach—content and language—offer students a chance both to obtain agricultural content and to practice their reading and writing skills, and this approach corresponds with the nature of an ESP course. Furthermore, acquiring the target language via the non-language subject matters could facilitate students’ language development since it helps students see how language learning enables them to put the language into practice when they are on their career path (Gil, 2012). Besides, the other two components of CLIL, which are cognition and culture, help empower students to obtain the content and develop the language. That is, cognition helps drive students’ process in gaining access to the content and in improving the language, while culture helps bring about students’ intercultural understanding which incorporates knowledge about way of life in terms of self and others, specifically related to the agricultural context. As a consequence,

to help undergraduate students enhance their language abilities with a special focus on reading and writing abilities, which is the main objective of the course, as well as to promote their agricultural content and cultural knowledge, which is a desirable and beneficial by-product, a Content and Language Integrated Learning (CLIL) course should be developed and implemented accordingly.

1.2 Objectives of the Study

1. To investigate the extent to which the CLIL course improves English language abilities of undergraduate students
2. To investigate the extent to which the CLIL course improves agricultural content of undergraduate students
3. To investigate the extent to which the CLIL course improves cultural knowledge of undergraduate students
4. To explore the opinions of undergraduate students toward the CLIL course

1.3 Research Questions

1. To what extent does the CLIL course improve English language abilities of undergraduate students?
2. To what extent does the CLIL course improve agricultural content of undergraduate students?

3. To what extent does the CLIL course improve cultural knowledge of undergraduate students?

4. What are the opinions of undergraduate students toward the CLIL course?

1.4 Statement of Hypotheses

As mentioned earlier, CLIL has played an important role in language teaching in terms of language outcomes, content outcomes, and cultural knowledge. As for language outcomes, several researchers have reported on the effectiveness of CLIL courses or curricula on students' language competence or abilities. For instance, research conducted by Chostelidoua and Grivab (2014) have portrayed the effects of the CLIL accountancy program in the Greek context on students' development of reading skill and content knowledge. Similarly, in another research study carried out by Suwannoppharat (2014), 24 Thai undergraduate students in the Chinese International Program made greater progress in writing and achieved a higher degree of cultural awareness after the CLIL implementation in the course. Furthermore, in another report on CLIL implementation in Japan (Tai, 2015), the analysis of 57 written assignments indicated that the 19 Japanese undergraduate students in an elective CLIL course concerning intercultural communication were able to develop their writing skill in terms of both accuracy and fluency throughout the semester.

Based on such empirical evidence and the aforementioned benefits of CLIL, the following hypotheses were formulated:

1) The post-test mean scores of undergraduate students' English language abilities are significantly higher than the pre-test mean scores after implementation of the CLIL course.

2) The post-test mean scores of undergraduate students' agricultural content are significantly higher than the pre-test mean score after implementation of the CLIL course.

3) The post-test mean scores of undergraduate students' cultural knowledge are significantly higher than the pre-test mean score after implementation of the CLIL course.

1.5 Scope of the Study

This research study employed the one-group pre-test-post-test non-randomized design, in which English language abilities, agricultural content, and cultural knowledge of the participants (undergraduate students) were measured before and after learning through the treatment (the CLIL course). Since the main focus of this study was a course development, the study was divided into two main phases: Phase 1: course development which included a needs analysis, course

development, and validation and evaluation of the developed course, and Phase 2: course implementation and evaluation of the effects of the course.

The participants constituted a section of the second-year, third-year, and fourth-year undergraduate students from the Faculty of Agricultural Technology at King Mongkut's Institute of Technology Ladkrabang (KMITL), Bangkok. Their ages were between 18 and 21 years old, and there were both males and females. Their native language was Thai. The level of their English language proficiency ranged from pre-intermediate to intermediate. They had taken the Foundation English 1 and 2 courses and were taking the English for Academic Purposes course in the 2/2015 academic year so as to be prepared for academic success in their major discipline, as well as in their prospective work. Since English for Academic Purposes is an elective course, an intact group was used, and the number of the participants in the study was 27.

1.6 Definitions of Terms

A *CLIL Course* refers to a course in which the target language is used for the learning and teaching of both content and language (Coyle et al., 2010). Such a course is based on the 4Cs framework of CLIL suggested by Coyle et al. (2010). It comprises 1) content—the non-language subject matters taught in CLIL, 2) communication—learners' production of the target language in both oral and written

form, 3) cognition—promotion of cognitive or thinking skills which drive the learning process, and 4) culture—intercultural awareness involving understanding of self and others, which includes acquiring the knowledge about ways of life, specifically associated with the subject matters taught in CLIL. In this study, a CLIL course referred to an ESP course based on the four components of CLIL adapted from the framework of CLIL proposed by Coyle et al. (2010), which included 1) *English Language Abilities*—language abilities of 1.1) English reading, and 1.2) of English writing, 2) *Thinking ability*—low and higher abilities of thinking, 3) *Agricultural Content*—the topics in agricultural subject areas, and 4) *Cultural Knowledge*—knowledge about ways of life in agricultural contexts, which could be related to agricultural products, practices that members of the culture carried out individually or with others, and perspectives, including perceptions, beliefs, values, or attitudes that underlined the products and that guided persons and communities in the practices of the culture.

English Language Abilities generally refer to the abilities to use English by means of the four skills, namely, listening, speaking, reading, and writing (Brown, 2001). In this study, English language abilities specifically referred to language abilities of English with an emphasis on reading and writing, which are elaborated as follows:

English reading ability refers to the ability to understand the text (Alderson, 2000). In order to understand the text in the reading process, a number of reading skills and strategies are required. According to Brown (2001), strategies for reading are, namely, identify the purpose of reading, use graphic rules and patterns to aid in bottom-up decoding, use efficient silent reading techniques for relatively rapid comprehension, skim the text for main ideas, scan the text for specific information, use semantics or clustering, guess when not certain, analyze vocabulary, distinguish between literal and implied meanings, and capitalize on discourse markers to process relationships. In this study, English reading ability referred to the ability to read the English language by understanding the main ideas and important details of reading texts in the field of agriculture. In order to develop the aforementioned abilities, students inevitably needed to rely on their thinking skills or cognitive ability. To illustrate, students had to understand a text in order to successfully identify the main ideas and effectively analyze the unknown words. They also needed to put all the details gained from the text together to make an inference and identify the author's purpose. Thus, during the time that reading ability was developed throughout the course, thinking ability which played a vital role in students' ability to read was developed simultaneously. English reading ability in the

present study was measured with the reading part of the CLIL test developed by the researcher. The test consisted of the test items that assessed different aspects of reading comprehension, namely, skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose.

English Writing Ability refers to the ability to compose the ideas of the writer (Myles, 2002). It involves various elements, namely, making stylistic and structural choices to meet the purpose of writing as well as to suit the readers, and following conventions of grammar, punctuation, and spelling (Sainsbury, 2009). In this study, English writing ability referred to the ability to write an English language paragraph, with the cause and effect text type and the process text type, in the field of agriculture. So as to develop their writing ability, it was evitable for students to use their thinking ability. That is to say, students had to construct the meaning from both written and graphic communication through the writing prompt when they were assigned to write a paragraph. Besides, they needed to compile their ideas and express them in a form of a paragraph in order to produce their writing. As a consequence, while writing ability was developed, thinking ability which helped empower students' ability to write was promoted simultaneously throughout the

CLIL course. English writing ability in this study was measured with the writing part of the CLIL test developed by the researcher, and the text types that were selected as the choices of the test tasks were considered based on the results of the needs analysis procedure which was undertaken in the first phase of the study to determine discrete features in writing ability of the participants to be assessed, namely, content, organization, vocabulary, language use, and mechanics, as suggested by Jacobs (1981, p. 30).

Thinking Ability refers to both low and higher abilities of thinking. Based on the Revision of Bloom's Taxonomy of Educational Objectives proposed by Anderson et al. (2001, pp. 67-68), such abilities include six main levels of thinking, which are 1) *remember*—'retrieve relevant knowledge from long-term memory,' 2) *understand*—'construct meaning from instructional messages, including oral, written, and graphic communication,' 3) *apply*—'carry out or use a procedure in a given situation,' 4) *analyze*—'break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose,' 5) *evaluate*—'make judgments based on criteria and standards,' and 6) *create*—'put elements together to form a coherent or functional whole and reorganize elements into a new pattern or structure.' In this study, thinking ability referred to both low and higher abilities of

thinking, which involved the six levels of cognitive domains based on a Revision of Bloom's Taxonomy of Educational Objectives proposed by Anderson et al. (2001, pp. 67-68). Such abilities included 1) remember—'retrieve relevant knowledge from long-term memory,' 2) understand—'construct meaning from instructional messages, including oral, written, and graphic communication,' 3) apply—'carry out or use a procedure in a given situation,' 4) analyze—'break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose,' 5) evaluate—'make judgments based on criteria and standards,' and 6) create—'put elements together to form a coherent or functional whole and reorganize elements into a new pattern or structure.' The ability was simultaneously enhanced at the same time as English language abilities, agricultural content, and cultural knowledge were developed throughout the course; thus, the ability in thinking in this study was measured simultaneously with every sub-part (the reading part, the writing part, the content part, and the culture part) of the CLIL test.

Agricultural Content refers to the content in the field of agriculture, which is associated with the selection, breeding, and management of crops as well as animals for economic production (Gupta & Gupta, 2002). As a consequence, the field involves the three main areas, namely, principles of plant production, principles of animal

production, and principles of agricultural economics. Agricultural content in this study referred to the content in the field of agriculture that Agricultural Technology students learned in the CLIL course. In order to make progress in their agricultural content, students inevitably needed to depend on their thinking skills or cognitive ability. To be specific, students had to memorize the lesson they had learned so as to be able to retrieve relevant knowledge from their long-term memory. Also, they needed to comprehend the lesson so that they could construct meaning from the agricultural content taught in each unit of the course. Furthermore, students might have to apply the agricultural subject matters in order to be able to implement such knowledge in a given situation. Since more than one ability was needed in order to be successful in accessing agricultural content in the CLIL course, during the time agricultural content was developed, thinking ability was progressed simultaneously.

The agricultural content in this study was measured with the content part of the CLIL test developed by the researcher. The test consisted of the test items that assessed the topics of agricultural content that students had learned through the course, such as ‘environmental factors affecting plant growth’ and ‘irrigation methods.’

Cultural Knowledge generally refers to knowledge on ways of life which involve how people think, feel, and relate to others (Brown, 2007). According to

Moran (2001), cultural knowledge can be typically understood as knowledge that includes three main shared aspects which are namely products—tangible as well as intangible products of a society, practices—patterns of social interactions, and perspectives of people in a particular social context, and community—beliefs, values, or attitudes that underline the products and that guide persons and communities in the practices of the culture. In this study, however, cultural knowledge referred to the specific knowledge about ways of life, practices, products, as patterns of the same interaction related to agricultural contexts. To exemplify, products involved agricultural tools or buildings, practices meant the practices people involved with such as agricultural irrigation or plant growing, or perspectives which could be the perceptions, beliefs, values, or attitudes that underlined the products and that guided persons and communities in the practices of agriculture, such as attitudes of online shoppers on agricultural products. In order to attain cultural knowledge, students needed to rely on their cognitive ability or to comprehend the targeted cultural knowledge, hence a reflective a key characteristic of CLIL that more than one skill was developed simultaneously. Cultural knowledge was measured with the cultural knowledge part of the CLIL test developed by the researcher, to assess the cultural knowledge emphasized in the course related to

such topic as ‘water management in Northeast Thailand’ and ‘irrigation in Thailand and Malaysia.’

Undergraduate students generally refers to a university student who has not yet achieved a first degree (Oxford Dictionaries). In the present study, undergraduate students referred to the population of this study, which was the second-, third-, or fourth-year undergraduate students from the Faculty of Agricultural Technology at King Mongkut’s Institute of Technology Ladkrabang, Bangkok, who had taken the two compulsory English courses: Foundation English 1 and Foundation English 2, and were taking the English for Academic Purposes course in the 2/2015 academic year. Their ages were between 18 and 21 years old, and there were both male and female students. Their native language was Thai, and the level of their English language proficiency ranged from pre-intermediate to intermediate.

1.7 Significance of the Study

1.7.1 For language learners, the research study can prove that CLIL is an effective instructional approach suitable to teach an ESP course; hence, it should be adopted as a tool to help language learners develop their content knowledge in their specific field of study and cultural knowledge related to agriculture in addition to language skills. Thus, with CLIL, the learners will be better equipped with not only

the needed target language but also specific content and cultural knowledge directly related to their major area of study. Therefore, they should be better able to function more efficiently and effectively in both academic studies and their future career after they have completed the CLIL course.

1.7.2 For language teachers, unlike other educational approaches applied in the realm of ESP which emphasize the target language and the subject matters only, the CLIL principles which have been adopted in this study highlight the language in focus, academic content, and cultural knowledge specifically related to the academic subject matters. With respect to the findings gained from the present study, ESP teachers may have some guidelines on how to design a CLIL course to enhance their students' language skills, academic content, and cultural knowledge which is specifically related to the academic content. With the developed CLIL course in the present study as a model, ESP teachers may consequently be able to design a course which encourages their students to be well-prepared for their further academic studies as well as their prospective career in their chosen major field of their study.

1.7.3 For administrators and stakeholders, the research findings may raise their awareness of an alternative teaching approach that can be utilized to improve

language learners' English language ability, content knowledge in their field of study, and cultural understanding directly related to the academic content, which are indispensable for both their further studies and future career. In brief, the CLIL approach may contribute to production of quality language learners who would subsequently become competent employees in the workplace.



Chapter 2

Literature Review

In order to further students' language abilities, the content in their field of study, and cultural knowledge, designing an appropriate course is demanded. Among the variations of language teaching approaches, the Content and Language Integrated Learning (CLIL) approach has been positively viewed as effective to develop students' second or foreign language. This is because the approach focuses on the target language, the content transmitted through the language, thinking skills, and cultural knowledge (Wolff, 2010). Thus, CLIL implementation helps promote meaningful language learning, thinking processes which are a vital part of academic studies, content in learners' field of study, and cultural knowledge. Due to the fact that language is used to convey content of interest and relevance to learners, the approach is widely discussed and then adopted in the field of Language for Specific Purposes (LSP) or English for Specific Purposes (ESP), which places its focus on the language needs of learners who need language to carry out specific roles (e.g., agribusiness employers, engineers, technicians, nurses, etc.) (Richards & Rodgers, 2003). Therefore, with the aim to develop a Content and Language Integrated Learning (CLIL) course to help undergraduate students enhance their language

abilities, content in their field of study, and cultural knowledge, the underlying principles and components of the CLIL approach and language course development are explored in this section of the study. In addition, the nature of reading and writing and the issues and practices in reading and writing instruction, as well as teaching and assessing reading and writing, are discussed. Apart from this, thinking or cognition, which is considered an important element in the process of language development, including reading and writing, will also be explored. Also, in the last section of the chapter, empirical findings of CLIL implementations are discussed to help best portray the existing view of the effectiveness of the approach.

2.1 Content and Language Integrated Learning (CLIL)

2.1.1 What is CLIL?

CLIL is an acronym for Content and Language Integrated Learning. According to Coyle et al. (2010, p. 3), it is “an educational approach in which various language-supportive methodologies are used which lead to a dual-focused form of instruction where attention is given both to the language and the content.” This corresponds with what Bently (2010) and Dalton-Puffer (2007) have mentioned that CLIL can be referred to as an approach which combines teaching subject matters with teaching the target language; thus, it is the use of a non-native language in non-language subjects. According to European Commission (2012), Content and Language

Integrated Learning or CLIL refers to teaching subject matters through the target language, and the content can be totally unassociated with language learning. In short, it can be seen that CLIL or Content and Language Integrated Learning is an educational approach that involves both the target language and the subject matters which may not have to be associated with language learning. Consequently, knowledge from the content specialist and that from the target language specialist are both vital for CLIL.

The term CLIL was first adopted in 1994 (Marsh, Maliers, and Hartiala, 2001 cited in Coyle et al., 2010) in the European context. The foreign language teaching scholars and other stakeholders find teaching approaches that attempted to equip language learners with better language capability (Marsh, 2002). To achieve such an aim, numerous initiatives were made to come up with the best teaching methods.

This led to the need to provide young European language learners exposure in school to a functional environment in acquiring and learning the target language by allocating additional curricular time for target language learning. Hence, the concept that integrates language into non-language subject matters emerged (Marsh, Maliers, and Hartiala, 2001 cited in Coyle et al., 2010)

Content and the target language, the two main foci of CLIL, may help reflect the underlying principles of the approach which are based on the assumption that the target language can be best learned when the subject matters are conveyed through the language (Wolff, 2010). According to Wolff, classroom content must be drawn from content subjects or academic and specific disciplines rather than from everyday life or general content of the target language. This can be seen that CLIL draws on the beliefs that the target language can be best learned through academic classroom content with the target language as a tool to access basic concepts and skills related to the subject matters.

CLIL co-exists with Content-Based Instruction (CBI); hence, some may be puzzled with the two terms in terms of their similarities and differences. For some scholars (Lara Garridio, n.d.), CLIL is an umbrella term that includes CBI; as a consequence, the two terms may be interchangeably used. However, for other scholars (Fernandez, 2009, for instance), despite the overlapping characteristics, such as being content-driven, contextualized learning, discourse construction content, and task-orientation, the two approaches differ in a number of aspects. Lasagabaster (2008) points out that, compared with CBI, CLIL is distinctive in the way that it is the approach that puts the focus on both language and content. This corresponds with

Wolff (2010) who explains that the goal of CLIL is to improve the learners' foreign language as well as the content competence. That is why it differs from CBI which places an emphasis only on content, and language skills are incidentally acquired in the process of learning. Apart from the focus of the two approaches, Coyle et al. (2010, p. 6) indicate that the second factor that makes CLIL different from CBI is the integration of the four main dimensions, namely, content, cognition, communication, and culture in teaching and learning practice of CLIL. Thus, it may be concluded that although CLIL and CBI share several characteristics, CLIL simultaneously emphasizes both content and language, and it integrates the four blocks of learning, which are content, communication, cognition, and culture, while CBI draws on the basis that content is the main focus of the learning process during which language is acquired by chance, cognition is not emphasized, and acquisition of culture may not take place during the implementation of the approach.

To summarize, CLIL is an educational approach with dual foci: subject matters and the target language. It is the notion that was originated in the European setting based on the premise that it could help foreign language learners develop their target language ability without extra teaching hours of that language, which is one of the keys to success in building multilingualism in Europe as indicated by the

European Commission. Simply put, CLIL draws on the beliefs that the target language can be best learned when the basic concepts of the subject are transmitted through the language. Besides, in spite of its co-existence with CBI, CLIL focuses on content as well as language, and it integrates several dimensions of learning, namely, content, communication, cognition, and culture, whereas CBI emphasizes only content, letting the target language be incidentally acquired.

2.1.2 Components of CLIL

As previously mentioned, the two main foci of CLIL are content and language. Yet, in addition to these two elements, CLIL is made up of the other two components—cognitive skills and culture. The literature on CLIL shows that the components of CLIL that influence CLIL implementations have been stated in two main views: 1) the view portrayed through the Internet site called *The CLIL Compendium* (The CLIL Compendium, 2001), and 2) the view of Coyle et al. (2010) depicted in the book entitled *CLIL: Content and Language Integrated Learning*. In the former view stated in the website *The CLIL Compendium*, the five main components of CLIL include a) *culture* (building intercultural knowledge and understanding, developing intercultural communication skills, learning about specific neighboring countries/regions and/or minority groups, and introducing the wider cultural context, b) *environment* (preparing for internationalization, accessing

international certification, and enhancing school profile), c) *language* (developing the target language competence, developing oral communication skills, deepening awareness of both the mother tongue and the target language, developing plurilingual interests and attitudes, and introducing a target language), d) *content* (promoting studying content via various views, accessing subject-specific target language terminology, and preparing for future studies and/or working life), and e) *learning* (promoting learning strategies, diversifying methods and forms of classroom practice, and increasing learner motivation). In the latter view suggested by Coyle, the four major components of CLIL are a) *content* (the subject matters or curricular subjects taught in CLIL, which can be the development of knowledge, understanding, and both social and affective skills, in specific areas of the curriculum), b) *communication* (the foreign language which learners learn as the target language, as well as the tool that learners use in learning that particular language, which can be both in oral and written forms), c) *cognition* (cognitive or thinking skills which drive the process of learning and teaching), and d) *culture* (intercultural awareness which involves understanding of self and others (sometimes viewed as *Community or Citizenship* (Bentley, 2010)). According to Coyle et al. (2010), the four building blocks

are interrelated and should be considered with a holistic view as illustrated in

Figure 1.

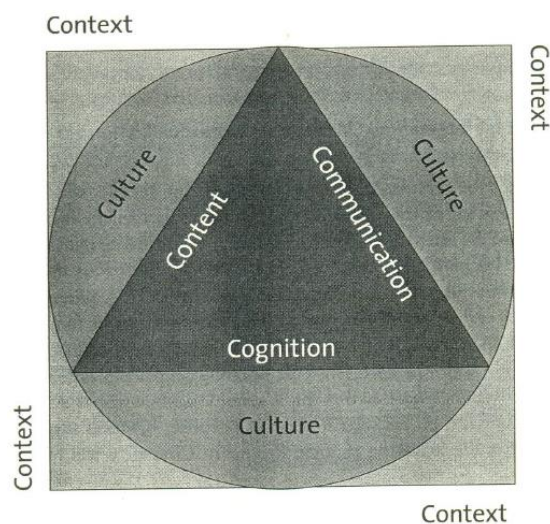


Figure 1: The CLIL 4Cs Framework (Coyle et al., 2010)

According to the figure, it can be seen that ‘content,’ ‘communication,’ and ‘cognition’ were placed in the inner triangle. This shows that CLIL places an emphasis on developing content (the non-language subject matters) and communication, (production of the target language), and cognition (thinking skills which drive the learning process) simultaneously. Apart from that, ‘culture’ is placed in the outer circle. This indicates the importance of culture—intercultural awareness involving understanding of self and others, which complement understanding of the subject matters and the target language. Moreover, the term ‘context’—an

educational situation in which CLIL has been applied—was included and placed outside the rectangle. This portrays how the four components should be put into practice in the wider educational context by taking into account contextual variables which have an influence on the CLIL implementation in a particular setting.

When comparing the two views on the CLIL components, it can be seen that the two perspectives are quite similar since they focus on the three shared components, namely, content, language, and culture. On the other hand, *The CLIL Compendium* also emphasizes the other two dimensions, namely, environment—making preparation for internationalization, especially EU integration, and learning—promoting learning strategies through different forms of classroom practice. On the other hand, Coyle highlights cognition—promoting cognition or thinking skills that drive the learning process), and context or how the four components should be applied in an educational context by considering contextual variables affecting the CLIL practice in a specific educational context.

In this study, the 4Cs framework proposed Coyle et al. (2010) was adopted. This was because, in addition to the focus on ‘content,’ ‘communication,’ and ‘culture,’ which are also included in the view suggested by *The CLIL Compendium*, the 4Cs framework highlights ‘cognition’ or promotion of cognitive or thinking skills,

which drives the learning process and facilitates the development of all the other three components.

Thus, based on the 4Cs framework proposed by Coyle et al. (2010), the CLIL course implemented in this study focused on developing students' English reading and writing abilities (communication), agricultural content (content), and cultural knowledge related to agricultural subject matters (culture). Besides, during the time English reading and writing abilities, the agricultural content, and the cultural knowledge were developed, thinking ability (cognition) that could help facilitate learning the course content was enhanced simultaneously. To be specific, in terms of language development, the students had to rely their thinking skills to construct the meaning from a reading text in order to yield their understanding of it, and to gain their comprehension on the writing prompt in order to be able to produce their writing when they were assigned to write a paragraph. Besides, as for agricultural content and cultural knowledge, the students inevitably needed to count on their cognition to make their progress in them. That is, they had to comprehend such subject matters to make their understanding of them, and might have to apply or evaluate the agricultural as well as cultural subject matters in order to be able to implement such knowledge or make judgements on it in a given situation. Also, with

respect to the role of contextual factors (context), nature of the students, nature of the course as well as the institution, time allocated per class, physical setting, and teaching resources were taken into consideration when developing the CLIL course.

2.1.3 Variations of CLIL Implementations

CLIL can be implemented in various levels and models. On the one hand, it may be applied at the curriculum level with respect to the policy of the school or department in the university as well as the course level as initiatives of an individual teacher (Dalton-Puffer, 2007). On the other hand, CLIL can be adopted in different models. In the view of Coyle et al. (2010), CLIL in higher education has been carried out in three possible models: 1) *Plurilingual education* (More than one language is used through many years of programs with the goals to achieve both the content and language outcomes), 2) *Adjunct CLIL* (Language teaching, which is ‘*field-specific*’ such as mechanical engineering or physics, is implemented parallel to content teaching.), and 3) *Language-embedded content courses* (Content must have been conceptualized from the outset with the objectives of language)). To summarize, CLIL in higher education can be adopted not only in both the curriculum level and the course level, but also in different models, namely, Plurilingual education, Adjunct CLIL, and Language-embedded content courses.

2.1.4 CLIL Course Development Processes

CLIL course development processes have been proposed in two views. In the first view, Coyle et al. (2010) suggest that CLIL can be implemented in class in six stages as follows:

1) *The construction of a shared CLIL vision*—collaboration between a language teacher and a subject teacher to come up with goals for the CLIL implementation;

2) *Analyzing and personalizing the context*— making a decision on an appropriate type of CLIL by studying variables such as type and size of school, environment, and local and national policies;

3) *Planning a unit*—creating a CLIL map by considering the four components which include content, communication, cognition, and culture;

4) *Preparing a unit*—modifying the mind map into materials, resources, activities and tasks, and other educational approaches;

5) *Monitoring and evaluating CLIL*—understanding classroom processes to realize what is required in future planning; and,

6) *Reflection and inquiry*—make a learning community of profession.

In the second view, Darn (2006) has proposed the four-stage framework, which comprises four steps, namely, 1) *Processing the text* (select texts with

illustrations and structural markers (both linguistic and diagrammatical markers)), 2) *Identification and organization of knowledge* (use diagrams of thinking which include tree diagrams for classification, groups, hierarchies, flow diagrams, and timelines for thinking), 3) *Language identification* (emphasize and categorize useful language in the text), and 4) *Tasks for students* (use various kinds of tasks with the consideration of affective factors such as learning styles and learning purpose).

When comparing the two frameworks, it can be seen that Coyle et al.'s Framework is more comprehensive than Darn's. While the former gives the blueprint of how to design a CLIL lesson from the beginning to the final stage, the latter, in a more specific way, shows how to design a CLIL lesson with a special focus on texts and tasks. In this study, to be able to develop a CLIL lesson in a comprehensive way, not only in the text and task levels, the CLIL course development processes suggested by Coyle et al. were adopted.

2.1.5 Benefits and Challenges of CLIL

Several scholars have indicated the benefits of CLIL in terms of content, language, cognition, and culture. According to Clegg (2006), CLIL can offer a variety of benefits, namely, language skills, subject knowledge, thinking skills, cultural understanding, and job market benefits. Like Clegg, Darn (2006) points out that CLIL can help develop the overall competence of the target language, as well as promote

awareness of the mother tongue. Moreover, it helps promote studying subject matters as well as build up intercultural communication skills/knowledge.

Furthermore, based on European Commission (2012), CLIL allows learners to have more contact with the target language without extra teaching hours and increases learners' motivation and confidence in both the language and the subject being taught.

In conclusion, CLIL is advantageous in the realm of education in multi facets. That is to say, CLIL promotes development/progression of new skills/knowledge with the use of the target language as a tool of teaching and learning subject matters. In addition to the content and linguistic aspects, CLIL helps promote thinking skills and develop cultural knowledge which help learners achieve bilingualism/multilingualism which has been increasingly important in recent years. Lastly, CLIL is positively linked to several affective factors, such as motivation and confidence, which are one of the keys factors behind successful learning.

In spite of a variety of benefits of CLIL, several challenges, namely, challenges of subject teachers and language teachers, and finding appropriate CLIL materials, have been found in implementing the approach. First, different teachers may find different challenges. That is, subject teachers have to study more about the language

which is important for the subject matters. On the other hand, language teachers have to study more about specific content (Wolff, 2010). Since CLIL implementation requires knowledge from both the content specialist and the target language specialist, to overcome this constraint, collaboration between subject teachers and language teachers may be needed. Nevertheless, according to Wiwczarowski (2009), collaboration with colleagues from other departments needs determination and a lot of attempts, and it may lead to unwillingness to adapt themselves to implement the new approach. That is why some teachers tend to insist on implementing the approach they have been familiar with and reject CLIL. Second, according to Eurydice (2006), one of the challenges found in CLIL education is finding suitable materials for specific contexts. CLIL teachers may experience difficulty in finding materials developed in the target language, which have to be related to the content. In some cases, teachers have to develop their own materials, and this may lead to their additional workload which they do not desire.

To conclude, CLIL is viewed as beneficial for language learners' development of many aspects such as content, language, thinking skills, and cultural understanding. Nevertheless, when it comes to its implementation, several challenges have been revealed. They include collaboration between the subject

teacher and the language teacher, as well as the need for effective materials. These issues need to be taken into careful considerations in order to ensure effectiveness of the CLIL practice.

2.2 Language Course Development

Language course or curriculum development can be referred to as a set of processes used to obtain a course or curriculum as a product. According to Richards (2007, p. 2) language course or curriculum development is an area that places an emphasis on identifying what knowledge and skills students learn in school, what experiences should be provided to facilitate teaching and learning, and how teaching and learning should be planned and evaluated. Consequently, in brief, in Richards's view, language course or curriculum development can be seen as the processes of "designing, revising, implementing, and evaluating language programs." Like Richards, Graves (2000) has defined language course development as the processes which encompass several major components, namely, determining objectives; setting content, materials, and methods; and evaluation. To conclude, language course development can be considered as series of processes in designing, implementing, and evaluating that particular language course, and the processes include main components such as objectives, content, and evaluation.

The aforementioned components are commonly found as the basis of frameworks of language course development. Among a wide range of frameworks of language course development, the framework of language course development process, proposed by Graves (2000), as can be seen in Figure 2, is widely accepted. However, it is noteworthy that although Graves's framework encompasses the main components as found in other frameworks (determining objectives; setting content, materials, and methods; and evaluation), the order in the process is indefinite. Thus, as long as a course developer can ensure that it makes sense to start the process, he/she can start anywhere, and this makes the framework very practical. For example, in some cases, the teacher may start with assessing needs if he/she needs information that serves as the basis for developing a course to suit the needs of a group of learners. In other cases, the teacher can start with formulating goals and objectives if he/she needs to determine the goals and objectives of the course. Simply put, it can be seen that a course developer can start at a step that he/she considers to be an issue.

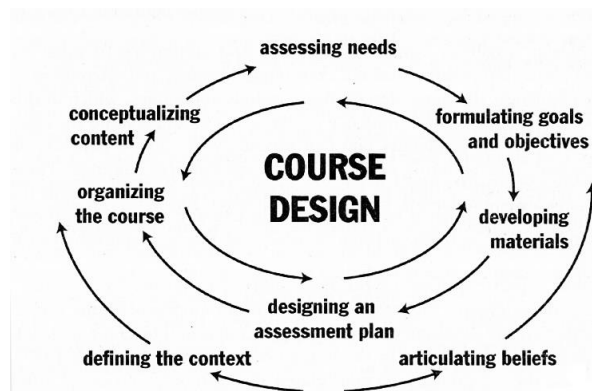


Figure 2: A Framework of Course Development Process (Graves, 2000)

The eight major components are discussed in details as follows:

1) *Defining the context*—Defining the context refers to addressing the relevant aspects of the contexts. These aspects include *people* (information about students as well as other stakeholders such as school administrators, parents, funders, and community), *time* (time allocated per class and how often class meets), *physical setting* (location of school and class size), *teaching resources* (material availability, material development, and teaching equipment), and *nature of the course and institution* (type or purpose of course, mandatory or open enrollment, and relation to other courses). This process helps the course developer understand his/her own setting, which makes developing a language course unique and based on a case-by-case basis.

2) *Articulating beliefs*—Articulating beliefs refers to understanding the views that the course developer holds in teaching and learning. Those views include *the view of language, the view of the social context of language, the view of learning and learners, and the views of teaching*. The views or beliefs that the course developer holds play a significant role in making a decision in every part of the language course development process.

3) *Conceptualizing content*—Conceptualizing the content involves both making a decision on what to include as the content of the course and organizing the content in a way that the relationship among the elements can be seen. This process helps make the course developer able to determine the course objectives, materials, sequence, and evaluation.

4) *Formulating goals and objectives*—Formulating goals and objectives refers to determining the *goals* as well as the *objectives* of the course. That is, the course developer has to be able to identify what the main purposes of the course (goals) are, and what points that the students are supposed to achieve along the way to reach those goals (objectives).

5) *Assessing needs*—Needs analysis is a process of gathering information that serves as the basis for developing a course or curriculum to suit the needs of a

specific group of learners. For ESP course and teaching English to adult learners, the learners' needs are quite specific since they are on the professional basis, such as English for business or English for engineering. Consequently, in developing such a language course, assessing needs is considered as an integral part. The process of needs analysis, as can be seen from Figure 3, encompasses deciding what information to gather and why; deciding the best way to gather it: when, how, and from whom; gathering the information; acting on the information; evaluating the effects and effectiveness of the action; and deciding on further or new information to gather. According to Graves (2000), the needs analysis process can be conducted in several forms such as questionnaires, interviews, lists, and writing activities.

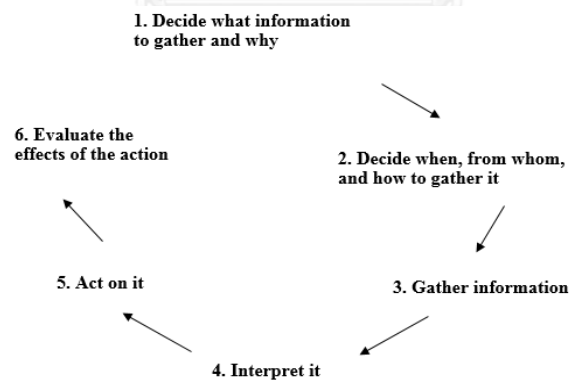


Figure 3: The Needs Analysis Cycle (Graves, 2000, p. 100)

6) *Organizing the course*—This step involves organizing and sequencing the course. It includes five sub-steps, namely, determining the organizing principle(s) (e.g.,

themes, genres, tasks) that drive(s) the course, identifying the course units based on the organizing principle(s), sequencing the units, determining the language and skills content of the units, and organizing the content within each unit. The product of this process is in the form of the syllabus.

7) *Developing materials*—Developing materials is the process by which the course developer designs units as well as lessons within the units in order to achieve the formulated goals and objectives.

8) *Designing an assessment plan*—This last process of the course development procedure is to assess student learning and assessing the course. The former, assessing students' learning, may be conducted as a) assessing proficiency to find out what the students can do in the broad sense in the target language, b) diagnosing ability or needs to determine what students can/cannot do regarding a skill or content area, c) assessing progress to determine what the students have learned regarding what has been taught in the course, and d) assessing achievement to find out whether the students have mastered the skills taught in the course. The latter, assessing the course, refers to evaluating several aspects of the course design. These include the goals and objectives, the course content, the needs analysis, the

organization of the course, the materials and methods, the learning assessment plan, and the course evaluation plan.

In conclusion, Graves's framework of language course development process comprises several components. Those components include defining the context, articulating the course developer's belief, conceptualizing content, formulating goals and objectives, assessing needs, organizing the course, developing materials, and designing an assessment plan. As shown in Figure 3 above, the processes in the framework are interrelated, and each process does not rely on any specific order. In other words, the course developer can start at any step as long as he/she can move forward on the entire process. This makes the framework widely accepted in the realm of language course development.

2.3 Reading Ability

Reading is an important skill. It builds up individuals' life skills and knowledge, as well as determines the way they process their thoughts and develops their imagination (Harrison, 2004). This corresponds with what Grabe (2009) points out—although reading skills cannot guarantee success for anyone, it may be much harder to be successful if one is not a skilled reader. Thus, according to Grabe (2009), in order to cope with the influx of information in an information technology era, effective reading skills and strategies are needed. In addition, when it comes to

language learning, reading can help language learners improve other skills such as writing; provide language learners opportunities to study other aspects of the language, namely, vocabulary, grammar, punctuation, and how to form sentences, paragraphs and texts; and promote language learners' imagination (Harmer, 1998). As a consequence, to develop a course to enhance reading ability, it is significant to explore the nature of reading ability, how to teach reading, and how to assess reading ability.

2.3.1 The Nature of Reading Ability

In order to develop reading skills, it is vital to probe the nature of reading. According to Grabe (2009), the act of reading is complex. As a consequence, so as to understand reading ability, it is significant to develop an insight into the process of reading. Furthermore, the interaction between the reader and the text, which can be clearly seen in the form of models of reading, as well as reading skills and reading strategies, which a reader can use when interacting with the text, should be explored to gain thorough understanding of reading ability.

2.3.1.1 Reading Process

According to Irwin (2007), to understand a text, at least five steps of a reading process are needed, namely, understanding sentences, connecting sentences, understanding the whole, elaborating, and metacognition. That is to say,

in terms of understanding sentences, the reader would need to group the words into meaningful phrases, which is called 'chunking.' For example, as Irwin (2007) has exemplified, in the sentence '*The red balloon slowly disappeared into the sky,*' a good reader automatically realizes that *red* should be grouped with *balloon* in order to specify the type of balloon, and that *slowly* describes *disappeared* rather than *balloon*. In addition to chunking, the reader would thus need to select ideas units to remember. For instance, apart from the idea that *the balloon disappeared*, if the idea that *the balloon is red* was important to the progress of the reading, the fact might also be remembered. In terms of connecting sentences, the relationships between clauses and sentences have to be comprehended. Thus, the reader would need to realize how the individual ideas are associated with another sentence. To illustrate, *he* in '*He was hungry*' refers to *John* in '*John went to the store.*' Another inference that can be made is that John went there because he was hungry. The third process, understanding the whole, involves an overall organized pattern of all the ideas. A good reader uses the author's organized pattern to construct his/her own internal summary, which helps him/her recall a piece of information. The fourth process, elaborating, is associated with the process of making inferences not necessarily conveyed by the author. This requires the process beyond a literal

interpretation. In the above example regarding John going to the store, a student may think it was an all-night convenience store, while another may predict John would buy a candy bar. Elaborations, therefore, involve the reader in an active way, and also require prior experiences, making predictions, affective response, mental imagery, and critical thinking. Finally, metacognition, the last cognitive process, can be defined as “conscious awareness and control of one’s own cognitive process.” This includes the process of selecting, evaluating, or regulating one’s strategies to control comprehension as well as long-term recall.

To sum up, according to Irwin, the five types of processes are associated with the act of reading, namely, understanding sentences by grouping words into meaningful phrases, which can be seen as the initial process in understanding the text; connecting sentences by associating the individual ideas with other sentences; understanding the whole by using the author’s organized pattern to construct their own internal summary; elaborating by making inferences not necessarily conveyed by the author; and metacognition by monitoring themselves to control comprehension, which can be seen as the final process in understanding the text.

Like Irwin who mentions that several processes are involved in the act of reading, Grabe (2009) has pointed out that reading encompasses various processes. That is to say, reading covers both lower-level processes and higher-level processes. The lower-level processes include word recognition, syntactic parsing (using grammatical information), and meaning encoding as propositions (building clause-level meaning from word meanings and grammatical information). These processes are part of working memory, “in which cognitive processing and knowledge resources are integrated for comprehension” (Grabe, 2009, p. 22). The higher-level processes include text-model formation (what the text is about), situation-model building (how we decide to interpret the text), inferencing, executive-control processing (how we direct our attention), and strategic processing. These processes “generally assume that the reader can direct attentional resources to these component skills (Grabe, 2009, p. 39)” while reading.

From the views of Irwin and Grabe on the nature of reading, it can be seen that reading is a complex cognitive process. It includes many sub-processes both in a lower level, such as the word level and the sentence level, and in a higher level, such as the interpretation level and the strategic or metacognitive level. These cognitive processes or components, in the lower level as well as in the higher level,

automatically work together in order to bring about the reader's comprehension of the text.

2.3.1.2 Models of Reading

Scholars in the field of reading have been looking for ways to describe what happens when people read. Such interaction between the reader and the text can be explained as models of reading. Barnett (1989 cited in Aebersold & Field, 1997, pp. 17-18) has provided a comprehensive summary of L1/L2 reading models as follows:

1) *Bottom-up theory* argues that the reader constructs the meaning of the text from the smallest units (letters to words to phrases to sentences, etc.), and that the small units operate so automatically that the reader is not aware of them.

For this process, decoding is an earlier term.

2) *Top-down theory* argues that the reader brings to the text his/her "knowledge, expectations, assumptions, and questions" to the text, and keeps reading as long as the text confirms his/her expectations. In other words, according to the top-down school, it is argued that the reader has his/her own cultural, syntactic, linguistic, and historical knowledge, into which he/she fits the text and checks back when new or unexpected information appears.

3) *The interactive school of theorists* argues that both bottom-up and top-down processes are occurring at the same time. It is the type of the text as well as the reader's background knowledge, language proficiency level, motivation, strategy use, and cultural beliefs about the reading that moves in both the bottom-up and the top-down theories.

To conclude, the three common models of reading in L1/L2 are the bottom-up theory, the top-down theory, and the interactive school. Whereas the bottom-up theory draws on the concept that meaning is constructed from the smallest aspects of language, from letters to words to phrases to sentences, the top-down theory is based on the idea that the reader brings with him/her the background knowledge which affects whether he/she continues to read or checks back when new or unexpected information emerges. In a combined way, the interactive school is grounded on both the bottom-up process and top-down process. According to the last school, the two types of process are occurring concurrently. Moving the mechanics of the bottom-up and top-down theories is determined by the type of the text as well as the reader factors, such as background knowledge or language proficiency level.

2.3.1.3 Reading Skills and Strategies

Reading skills and reading strategies are important tools to help readers build effective comprehension to the text. Paris, Wasik, and Turner (1991, p. 611) have defined reading skills as “informational processing techniques that are automatic, whether at the level of recognizing grapheme-phoneme correspondence or summarizing a story. Skills are applied to a text unconsciously for many reasons including expertise, repeated practice, compliance with directions, luck, and naïve use.” It is clear that, according to him, reading skills involve the processes in word cognition as well as the processes of syntactic parsing and semantic proposition formation. In a similar way, Davis (1968 cited in Alderson, 2000) has suggested that reading skills comprise recalling word meanings; drawing inferences about the meaning of a word in context; finding answers to questions answered explicitly or in paraphrase; weaving together ideas in the content; drawing inferences from the content; recognizing a writer’s purpose, attitude, tone, and mood; identifying a writer’s technique; and following the structure of a passage. As can be seen, reading skills defined by Davis cover skills or abilities to recognize words, to connect them into sentences, and to connect sentences into the meaning of the whole text, including making inferences.

In a more explicit way, reading strategies are commonly defined as processes that “are consciously controlled by readers to solve reading problems” (Grabe, 2009, p. 221). The examples of principal strategies for reading comprehension can be seen in the list of reading strategies stated by Brown (2004). The list includes the reading strategies, namely, 1) identify purposes in reading a text; 2) apply spelling rules and conventions for bottom-up decoding; 3) use lexical analysis (prefixes, roots, suffixes, etc.) to determine meaning; 4) guess meaning (of words, idioms, etc.) when not certain; 5) skim the text for the gist and for main ideas; 6) scan the text for specific information (names, dates, key words); 7) use silent reading techniques for rapid processing; 8) use marginal notes, outlines, charts, or semantic maps for understanding and retaining information; 9) distinguish between literal and implied meanings; and 10) capitalize on discourse markers to process relationships.

However, reading skills and reading strategies may overlap in some cases. For instance, it may be quite difficult to draw explicit line between the skill of recognizing words and the strategy of determining meaning, as well as from the skill of drawing inferences from the content, and the strategy of distinguishing between literal and implied meanings. This corresponds with what Grabe (2009) argues that there are several cases in which the distinction between what a strategy is and what

a skill is can be ambiguous, making the distinction between reading skills and reading strategies problematic.

2.3.2 Teaching Reading

Teaching reading has been influenced by models of reading, which include the bottom-up theory, top-down theory, and interactive reading. Brown (2001) has explained teaching reading on the basis of the three approaches. As for the bottom-up theory, it is teaching language symbols, grapheme-phoneme correspondences, syllables, and lexical recognition in the first place, and then comprehension emerges from these parts. Since knowledge of the language is needed to yield readers' understanding, teaching reading based on this theory is data-driven. However, when it comes to the top-down theory, readers will be trained how to work through a problem-solving process, making inferences, and making a decision to retain or not to retain in order to continue their reading; consequently, readers must rely on their intelligence as well as experience to comprehend a text. That is why it is conceptually-driven. As previously mentioned, both bottom-up and top-down processes are occurring at the same time (Barnett, 1989 cited in Aebbersold & Field, 1997); thus, the interactive reading emerges. According to the approach, teaching reading is a combination of a) teaching readers to recognize linguistic signals (letters, morphemes, syllables, words, phrases, grammatical cues, and discourse markers) and

use their data-processing mechanisms to interpret the signals, and b) teaching readers to use their background knowledge and experience to understand a text.

According to Brown, recent research results help prove success of interactive reading on teaching reading.

2.3.3 Assessing Reading

In the reading classroom, apart from playing a role of a facilitator of learning, the teacher is also supposed to play a role of an assessor. According to Aebersold and Field (1997), to measure and evaluate the products of students' learning, the teacher may have to rely on various kinds of measures, which can range from the most formal forms, such as a final examination, which is normally arranged at the end of the semester, to the most informal forms, such as a quiz to recall knowledge, which may be employed at the end of a lesson.

Among the rich variation of measures in language teaching, the two main types of assessment methods are traditional methods and alternative methods (Brown, 2004). Description of the two approaches in language assessment was offered by Armstrong (1994 cited in Brown, 2004) and Bailey (1998 cited in Brown, 2004). Brown has given the summary of the two types. That is, the traditional methods are mostly based on tests produced in the form of one-shot, standardized exams in a timed, multiple-choice format. Since they focus on the 'right answer,' and can be

considered as product-oriented, together with decontextualized test items, they probably lead to non-interactive performance and foster extrinsic motivation. Unlike the traditional methods, the alternative methods are not mainly based on tests, and they are long-term assessment in the untimed, free-response format. Due to the fact that they are process-oriented, which rely on contextualized communicative tasks, individualized feedback and washback and criterion-referenced scores, together with open-ended answers, the methods promote interactive performance and foster intrinsic motivation.

Nonetheless, besides the summary, Brown points out the two caveats on the above description. From his perspective, firstly, it is quite difficult to make a clear distinction between what Armstrong (1994 cited in Brown, 2004, p. 13) and Bailey (1998 cited in Brown, 2004, p. 13) have labeled traditional and alternative assessments. In other words, many forms of assessments “fall between the two” and some “combine the best of both.” Secondly, the description of Armstrong and Bailey, as previously mentioned, reflects a bias toward traditional assessment. One may have the delusion that traditional assessment causes only negative aspects, whereas alternative assessment brings about only the positive aspects. According to

Brown, the traditional methods are worth being utilized due to the functions they provide.

Like in general terms of language teaching, the two main approaches of language assessment can be seen in the field of reading. According to Aebersold and Field (1997), the traditional methods mainly depend on tests, which can be in the forms of multiple-choice questions, vocabulary tests, cloze tests, completion tasks, short answer and open-ended questions, and contextualized or authentic tasks. From the view of Aebersold and Field, since the use of tests is associated with power, classroom teachers are supposed to negotiate between the authority they portray when giving a test and their role as educators to manage classes in which learning atmosphere can be achieved without unproductive tension and anxiety. As for the alternative methods, this is the shift away from what Aebersold and Field call “using assessment as a way to keep students in their place” to what Cohen (1994 cited in Aebersold & Field, 1997) describes as using assessment to help students understand just where they are situated in the quest for second language proficiency. Based on the description of Aebersold and Field (1997, pp. 168-172), six alternative activities, namely, journals (audio and written), portfolios, homework, teacher assessment through observation, self-assessment, and peer assessment, are included. These

alternative methods can be used, along with tests, or the traditional methods, to best evaluate the products of the students' learning in language classes or courses.

In conclusion, the two main types of reading assessment are traditional assessment and alternative assessment. Although traditional reading assessment such as multiple-choice questions and cloze tests may have been criticized for the emphasis on the 'right answer' and can be judged as product-oriented, with decontextualized test items, this type of assessment is needed for some functions in order to more clearly reflect students' learning progress. The most important thing in using tests is the balance between the authority teachers exercise in giving a test, and the teachers' responsibility as educators to bring about a learning atmosphere without unproductive tension and anxiety. Yet, in order to yield the optimum evaluation, alternative assessment, which can be applied in various forms, such as portfolios, observations, and both self- and peer-assessments, should be employed in language classrooms.

2.4 Writing Ability

2.4.1 The Nature of Writing Ability

To develop writing skills, it is essential to understand the nature of writing ability. Although the nature of writing ability can be explored in several aspects (Weigle, 2002), in this study, the nature of writing will be explained and portrayed in

three major ways: writing from a writer's viewpoint, writing as a cognitive process, and writing as a social and cultural phenomenon.

2.4.1.1 Writing from a Writer's Viewpoint

Brown (2001) states that the main characteristics of writing from a writer's viewpoint are as follows:

1) Permanence

The product of writing or the written language is something that lasts for a long time. Hence, once writers have finished their piece of writing and taken its final draft to their audience, they lose their power to revise it, to clarify it, or to cancel it.

2) Production time

Writers are provided with appropriately allocated time to apply the activities in the cognitive process of writing, such as planning, drafting, revising, and editing, in order to produce their final product of writing. Although, mostly, in some educational contexts, students have to deal with time limitation to finish their writing, the proper stretches of time are still given.

3) Distance

When writing, writers are supposed to anticipate their audience. This includes general characteristics of the audience, as well as the interpretation of words, phrases, sentences, and paragraphs. This is the factor that requires the writer's ability

to predict the audience's knowledge, which ranges from their general knowledge, cultural and literary background knowledge, and specific topical knowledge, to how interpretation will be made on the language choice.

4) Orthography

To produce the written language, the formulated ideas, whether they are simple or complicated, have to be transferred through a number of letters and written symbols. Mastery in the mechanics of writing is an important part of writing.

5) Complexity

Writing is a complex process. Writers have to learn so many things in order to be able to create a good piece of writing, such as learn to convey their ideas without redundancy, learn to coherently combine sentences into a paragraph or to combine paragraphs into a text, learn to make references to other parts in the text, and learn to vary lexical and syntactic structures.

6) Vocabulary

Written language really demands vocabulary as a way to bring about good word choice.

7) Formality

In some contexts of writing, to follow particular conventions, formality is needed. For instance, in academic writing, students have to learn about complex conventions of writing such as how to describe, explain, compare and contrast, and criticize.

In summary, the specific elements of writing as described above reflect the particular nature of writing from a writer's viewpoint. That is, in order to develop a piece of writing, writers must know the conventional spelling system of the language, or the orthography. In addition, they have to apply various aspects of knowledge, such as that on vocabulary, social and cultural aspects when it comes to the distance factor, and particular conventions of writing whether formality is needed or not. Besides, writers must be aware that the written language is permanent and complex; thus, it may require sub-skills for writing, such as the ability to use grammatical systems as well as cohesive devices in order to produce a piece of writing in an allocated time.

2.4.1.2 Writing as a Cognitive Process

Apart from a writer's viewpoint, the other major way to probe the nature of writing ability is exploring writing as a cognitive process. According to Weigle (2002), in terms of cognitive processes, among a number of models of writing proposed, the first model of the writing process and one of the most influential

models for teaching writing is the model proposed by Hayes-Flower (Flower & Hayes, 1981) (Figure 4).

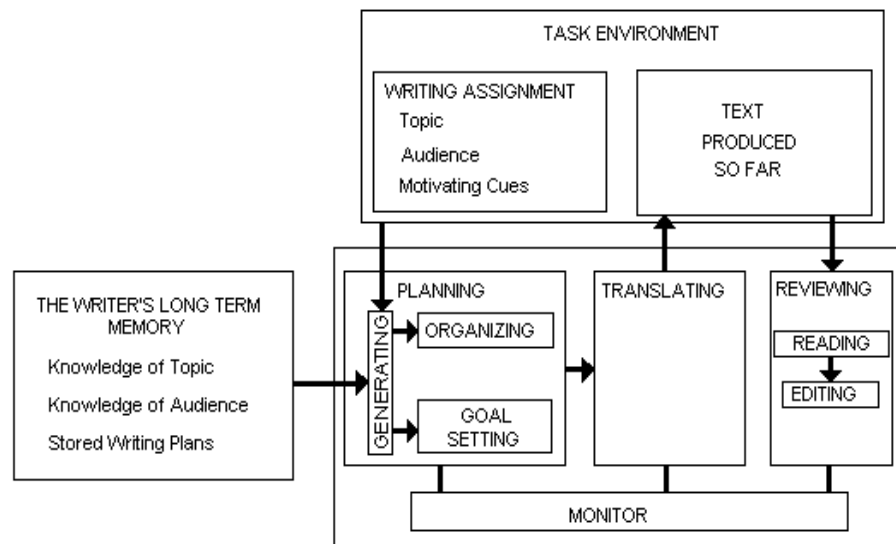


Figure 4: The Hayes-Flower's Writing Model (Flower & Hayes, 1981)

This is the model of a writing process which shows an attempt to portray the main thinking process as well as various influences on the writing process. To be specific, the model describes the act of writing, which incorporates three main aspects: the task environment, the writer's long-term memory, and the writing processes. The first part, the task environment, ranges from the writing assignment to the text produced so far. The second part, the writer's long-term memory, includes the writer's stored knowledge of the topic, of the audience, and of writing plans. The third part is writing processes that include planning, translating, and reviewing, which are controlled by a monitor. In the view of Weigle (2002), the model

is beneficial for the realm of writing since it shows the fact that writing is a recursive rather than linear pattern. Therefore, teaching writing processes is probably more effective than giving students models of a particular rhetorical form and asking them to follow the models in producing their own writing.

2.4.2 Teaching Writing

As mentioned earlier, the nature of writing can be seen from various aspects. Consequently, in order to yield effective instruction in writing, it is necessary to understand major pedagogical approaches in writing, which differ in their conception of the nature of writing.

2.4.2.1 Writing as a Sentence-Level Structure

The focus of the approach is on a sentence-level structure in the use of controlled composition (Matsuda, 2003). That is why the approach is referred to as controlled composition, or sometimes as guided composition (Silva, 1997). Since the approach is based on a behavioral theory of learning with the highlight on habit-formation, controlled composition which includes combining and substitution exercises are used so that students are provided an opportunity to learn about sentence structures, and to be able to produce their writing with as few mistakes as possible. In other words, the text, according to the approach, is considered only in terms of linguistic elements, regardless of the quality of ideas or expressions.

Furthermore, the context of writing in terms of audience or purpose is neglected (Silva, 1997).

However, the use of controlled composition was later found problematic due to the fact that grammar exercises at the sentence level could not “help students to produce original sentences, let alone free composition” (Matsuda, 2003, p. 20). As a result, the use of guided composition, which allows students to have more freedom when writing, was introduced. Nevertheless, no matter with more or less fixed structural guidance, the basis of the approach of writing is that writing or composing beyond the sentence level needs guidance or control.

2.4.2.2 Writing as a Process

Rather than a reproduction of learned grammatical features, the emphasis of the writing approach is on the writer’s cognitive process of constructing organization as well as meaning (Matsuda, 2003). According to the approach, writing is “a non-linear, exploratory and generative process whereby writers discover and reformulate their ideas as they attempt to approximate meaning” (Zamel, 1983 cited in Hyland, 2002). In addition, the activities in the process which are Pre-writing, Writing, and Post-writing are recursive rather than uninterrupted (Hyland, 2002). According to Hyland (2002), the model of Flower and Hayes’ (1981 cited in Hyland, 2002) is influential to this approach. It draws on the belief that the writing process is

mobilized by the task-environment as well as the writer's long-term memory. The

major features of the model are as follows:

- writers have aims
- they make a plan
- planning includes defining a rhetoric problem, considering it in a context, paying attention to its parts, coming up with solutions, and transferring ideas into the piece of writing
- all activities can be reviewed, even before the text has been produced
- planning, drafting, revising, and editing are recursive, interactive, and potentially concurrent
- plans and text are evaluated
- the entire process is managed by a monitor.

As stated above, it can be seen that the model describes mental activities which function when the writer is writing. This may portray the major assumptions of the approach, which shows writing teachers how writing should be taught (Hyland, 2002). That is why some scholars considered the arrival of the approach as a “paradigm shift” (Matsuda, 2003, p. 21) in the realm of writing.

In spite of satisfactory and wide reception of the approach in ESL, the process-based approach has been negatively criticized by some as well. That is to say, the limitation of the approach is believed to be a neglect of a particular context of writing; thus, the responsibility of this is on the writer (Silva, 1997). To be specific, it is the writer who has to identify “the particular task, situation, discourse community, and sociocultural setting” (p. 16) in which he/she is involved as a way to produce an effective piece of writing. This brought about the shift from the writer to the reader with the focus on the academic discourse community.

2.4.2.3 Writing as Language Use in Context

As previously mentioned, writing as a process, according to several critics, neglects to take into consideration variations in the process of writing, such as writing tasks, situations, and shared knowledge of writers in a particular academic discourse community. Then the question from scholars in English for Specific Purposes (ESP) as well as English for Academic Purposes (EAP) whether the process-based approach can really help develop students' writing ability for the academic profession arose, and an alternative approach in writing has been proposed.

As for the alternative approach, the emphasis is on academic discourse genres as well as the nature of academic writing tasks (Silva, 1997). Students are provided with the context of language use in order to successfully

understand the various contexts of writing, including main features of a particular academic genre (Matsuda, 2003). Therefore, writing is the production of what is acceptable in an academic community, of which the members are supposed to have “schemata for academic discourse and clear and stable views of what is appropriate” (p. 17), and learning to write is part of being involved in such an academic institution.

In summary, teaching writing can be viewed in three main approaches which include writing as a sentence-level structure, writing as a process, and writing as a language use in context. The focus of the first approach is on a sentence-level structure in the use of controlled composition, which focuses on exercises used to train students to learn about sentence structure and to enable them to produce their writing with few mistakes. Although the approach may be effective for writers in terms of linguistic elements, it has been believed to ignore the quality of ideas or expressions. Thus, the focus of teaching writing is then shifted to the writer’s cognitive process of constructing organization and meaning, which is the basis of writing as a process. According to the second approach, writing is a mental process which involves Pre-writing, Writing, and Post-writing as recursive activities. Despite its success, the approach is criticized in a way that it seems to neglect a particular context of writing. Then the third approach emerged, and it is the approach that

places an emphasis on academic discourse genres and the nature of academic writing tasks. That is, writers are provided with the context of language use so that they understand the contexts of writing. Due to the fact that writing on the basis of this approach is the production of what is acceptable in an academic community, it helps enhance students' writing ability for the academic profession and it has been viewed to be beneficial in the field of English for Specific Purposes (ESP) and English for Academic Purposes (EAP).

In this study, the process-based writing approach was adopted mainly due to the nature of the course. As previously mentioned in the background of the study, the CLIL approach was implemented in the English for Academic Purposes (EAP) course. Although the course was an elective ESP course included in the Agricultural Technology Curriculum, students were not supposed to produce their writing in academic discourse genres according to the course description. To be specific, apart from emphasizing on reading texts related to students' major subjects, the EAP course, focused on using the appropriate language in different text patterns, such as processes and causes and effects. So as to help develop students' writing in different text patterns, the process-based writing approach seemed to suit such a situation. This was because the approach placed an emphasis on the writer's

cognitive process of constructing organization as well as meaning. Thus, through the activities in the process, namely, planning, making a draft, and revising and editing, students had an opportunity to develop their ability to produce their writing in a particular text pattern.

2.4.3 Assessing Writing

When it comes to writing, the performance to be assessed can be categorized into four types: imitative, intensive (controlled), responsive, and extensive (Brown, 2004). That is to say, 1) *imitative writing performance* involves learners' basic skills of writing which includes writing letters, words, punctuation, and simple sentences. Since, at this stage, learners' aim is to become proficient in the mechanics of writing, form is the primary focus rather than context and meaning. 2) *Intensive (controlled) writing performance* involves learners' skills of writing in selecting appropriate word(s) in a particular context, collocations and idioms, and correct grammatical aspects that suit a sentence length. Thus, although context and meaning are important to some extent, form is the place of focus in most assessment tasks. 3) *Responsive writing performance* involves learners' skills of writing in a limited discourse level at which learners are required to combine sentences into a paragraph and to create an organization of two or three paragraphs. This may include brief narratives and descriptions, short reports, lab reports, summaries, brief responses to reading, and

interpretations of charts and graphs. Due to the fact that learners must focus on the discourse conventions needed to meet the aims of the written texts, form-focused attention is required at the discourse level with the primary concern with context and meaning. 4) *Extensive writing performance* involves learners' skills and strategies of writing for all purposes with the length of an essay, a term paper, a research report, or a thesis. At this level, learners emphasize achieving the objectives of a written text, organizing the ideas, varying syntactic and lexical choices, and getting involved with processing drafts to yield a final paper. Since the process of multiple drafts is important, focus on grammatical form depends on occasions of editing or proofreading a draft. It can be seen that, compared to writing performance in stages 1 and 2, in latter stages, stages 3 and 4 require learners' more complex and sophisticated skills in writing with a strong emphasis on context and meaning as well as on form focus at the discourse level.

With respect to the categories of writing performance as previously explained, assessment task design can be elaborated in three main types, namely, imitative writing, intensive (controlled) writing, and responsive and extensive writing (Brown, 2004) as follows:

1) *Tasks for imitative writing* are used to assess test-takers' ability 1.1) to write letters, words, and punctuation and 1.2) to spell and detect phoneme-grapheme correspondences. For the first sub-type, *writing letters, words, and punctuation*, some of the common types of tasks are a) copying (asking test-takers to copy letters or words), b) listening cloze selection tasks (asking test-takers to select the best alternative from choices given to fill in the blanks in a text while listening), c) picture-cued tasks (asking test-takers to look at pictures displayed and write the word the picture represents), d) form completion tasks (asking test-takers to fill in a form-registration or application, etc. that asks for name, address, phone number, and other information), and e) converting numbers and abbreviations to words (asking test-takers to write numbers in words). For the second sub-type, *spelling and detecting phoneme-grapheme correspondences*, some of the common types of tasks are a) spelling tests (asking test-takers to write the spelling of a word), b) picture-cued tasks (asking test-takers to select the item that shows the spelling which corresponds with the picture displayed), c) multiple-choice techniques (asking test-takers to select the item that shows the spelling of the word which best suits the context (phrases/sentences) given), and d) matching phonetic symbols (asking test-takers to look at phonetic symbols and write the correctly spelled word alphabetically).

2) *Tasks for intensive (controlled) writing* are used to assess test-takers' ability in grammar, vocabulary, or sentence formation. Common types of the tasks are a) *dictation* (asking test-takers to listen to stretches of discourse and write them down with proper punctuation insert) and *dicto-comp* (asking test-takers to listen to a paragraph read at normal speed, usually two or three times, and to rewrite it), b) *grammatical transformational tasks* (asking test-takers to change the tense in a paragraph, change full forms of verbs to reduced forms, change statements to yes/no or wh-questions, change questions into statements, combine two sentences into one using a relative pronoun, change direct speech to indirect speech, or change from active to passive voice), c) *picture-cued tasks* (asking test-takers to look at the picture(s) and write a sentence/sentences describing it/them), d) *vocabulary assessment tasks* (asking test-takers to define a word, to write collocational possibilities, or to derive morphological forms), e) *ordering tasks* (asking test-takers to order or reorder a scrambled set of words into a correct sentence, and f) *short-answer and sentence completion tasks* (asking test-takers to respond to the prompts by writing a short answer or to complete a sentence).

3) *Tasks for responsive and extensive writing* are used to offer test-takers' opportunity to give creative responses at the discourse level within a pedagogical or

assessment framework. Common types of the tasks are *a) paraphrasing* (asking test-takers to write a text in their own words), *b) guided question and answer* (asking test-takers to write an answer in response to a set of questions that serve as an outline of the test-takers' writing), and *c) paragraph construction tasks* (asking test-takers to develop a paragraph or a longer text).

To sum up, task design in assessing writing corresponds with types of writing performance. That is, tasks for imitative writing aim to assess test-takers' ability to write letters, words, and punctuation, as well as to spell and detect phoneme-grapheme correspondences. In a more advanced level, tasks for intensive (controlled) writing are used to assess test-takers' competence in grammar, vocabulary, or sentence formation. At the utmost level, tasks for responsive and extensive writing are used to assess test-takers' ability to write at the discourse level which may be at the paragraph level or beyond the paragraph level.

2.5 Thinking Ability

2.5.1 What is Thinking?

Several scholars have discussed the meaning of thinking skills. Morin (2013), for instance, has defined thinking skills or cognitive skills as the abilities to gain both meaning and knowledge from experience as well as information. As a result, such abilities includes many aspects of thinking, such as thinking about new information,

making its connections to other information acquired, etc. Similarly, according to Bernstein (2011), thinking skills refer to the ability to perform several mental processes, such as reasoning, remembering, understanding, and problem solving. In short, thinking skills can be referred to as the ability to be engaged in many levels of the mental process, such as remembering, understanding, and applying, in order to create meaning of the new information applied.

As previously mentioned, thinking skills can be viewed in many levels. Based on *Bloom's Taxonomy of Educational Objectives: The Classification of Educational Goals (Handbook1: Cognitive Domain)* (Bloom, 1956), thinking skills can be seen in six main levels. The levels include 1) *knowledge*—recalling information, 2) *comprehension*—understanding facts and ideas, 3) *application*—using facts and ideas acquired to solve problems in new situation, 4) *analysis*—breaking information into parts and identifying the relationships of those parts, as well as the purpose or point of view of the author, 5) *synthesis*—compiling information in a new pattern, and 6) *evaluation*—making judgments on information.

In 2001, Anderson have suggested a *Revision of Bloom's Taxonomy of Educational Objectives*. In the thinking process (or cognitive process as the authors have labeled) of the revised version, despite the six levels of thinking that have been

retained, the two major changes can be seen. The changes are 1) changing the terms in the six levels from noun to verb forms, and 2) rearranging the order of the last two levels from 5) *synthesis* and 6) *evaluation* in the original version to 5) *evaluate* and 6) *create* in the new version. As a consequence, the revised version of *Bloom's Taxonomy of Educational Objectives* in the thinking process includes the six major levels of thinking, namely, 1) *remember*, 2) *understand*, 3) *apply*, 4) *analyze*, 5) *evaluate*, and 6) *create*.

In conclusion, thinking skills can be referred to as the abilities to perform mental processes in the levels of both low and higher orders. Based on *Bloom's Taxonomy of Educational Objectives: The classification of educational goals (Handbook1: Cognitive Domain)* (Bloom, 1956), thinking skills can be categorized into the three levels of low order, which encompass knowledge, comprehension, and application, and the other three levels of higher order, which cover application, synthesis, and evaluation. Bloom's Taxonomy has been revised by Anderson and his colleagues in 2001 (Anderson et al., 2001) by changing the names in the six levels from noun to verb forms to highlight the six levels in terms of the actions more clearly referred in the verb forms. Furthermore, the order of the last two levels has been rearranged from 5) *synthesis* and 6) *evaluation* (the original version) to 5)

evaluate and 6) *create* (the new version) in order to emphasize ‘create’ as the ultimate level of thinking.

2.5.2 Teaching Thinking skills

King, Goodson, and Rohani (1998) have discussed teaching strategies/methods used to teach higher order thinking skills, which can be applied to teaching low order thinking skills as well. The teaching strategies/methods are as follows:

1) Scaffolding

Scaffolding involves providing students support. The teacher can provide students support in the initial part of a lesson, and then gradually give responsibility to the students to make a decision on their own. Nonetheless, only the right amount of support can cause students’ development of higher order thinking skills, not too much or too little.

2) Direct instruction

Direct instruction refers to the teacher’s use of direct teaching techniques in the introduction of higher order thinking skills. According to King et al. (1998), although the direct instruction does not probably suit promoting such skills, some strategies can be adopted to yield successful direct teaching. That is, the teacher should use the direct instruction in a limited way by combining it with guided

practice so as to provide students opportunities to practice their thinking skills.

Besides, long lectures should be avoided to best capture students' attention.

3) Questioning strategies

Questions can be used to invoke students' higher order thinking skills. That is to say, they should elicit answers which have been provided. In addition, questions should have been planned before the actual learning in order to help assure that the questions are beyond the level of simple recall of information.

4) Feedback

Feedback can be used to bring about students' progress in higher order thinking skills. In so doing, the teacher can adopt feedback sub-strategies, such as using informal checks (e.g., thumbs up or thumbs down to show who got a problem right); giving immediate, specific, and corrective information by using a positive emotional tone; avoiding expressions of low expectations; and avoiding insincere feedback or too much praise.

5) Team activities

Team activities are beneficial in developing students' higher order thinking skills since students can help each other monitor their activities. Hence, this helps build up skills/knowledge by means of social interaction.

6) Computer mediation

Computer-mediation provides students access to remote resources. That is, students have an opportunity to work with students in other areas. The technique can be combined with the regular teaching methods in developing higher order thinking skills.

To conclude, there are many methods/strategies which can be adopted to teach thinking skills. The teacher may give support to students or apply direct instruction in combination with other methods/strategies. Apart from that, questions, feedback, and team activities can be used to help promote students' thinking skills. Besides, with respect to the Information Technology Era, computers can be mediated with teaching such skills in order to be able to retrieve information in other areas. Although each of the methods/strategies has been elaborated as a single technique, those methods/strategies can be combined with one another in order to yield effective teaching of thinking skills in a particular context.

2.5.3 Teaching Thinking in a Language Class

Several scholars have expressed their views on the positive role of thinking skills on students' academic skills. Cottrell (2001) has stated that thinking skills are a basis for accomplishing a wide range of academic tasks. Consequently, if teachers do not take teaching of such skills into their considerations, the skills may not be

successfully developed and students may encounter difficulty in achieving their academic goals. In addition, Cottrell (2005) highlights higher order thinking skills such as analytical thinking skills and critical thinking skills as a way to promote students to use their mental processes such as attention, categorization, and selection, which are important for students' academic studies. Likewise, Moseley et al. (2005) have pointed out a close relationship between thinking and learning in academic studies. To illustrate, thinking skills are a good basis for learning many subject disciplines, including languages. Therefore, due to the benefits of thinking skills of academic studies as elaborated, it is teachers' responsibilities to promote thinking skills among their students.

Apart from their significant role on development of academic skills, thinking skills play an important role in relation to language skills. From the perspectives of Islam (2015), thinking is associated with language skills. Islam has exemplified the power of thinking on language learning by pointing out that thinking can help language learners learn how to analyze the organization of ideas in a text and make them able to convey these ideas clearly and systematically. That is why thinking skills help develop language abilities such as reading and writing. Similarly, Suhor (1984) has mentioned that thinking skills have a close relationship with language

skills such as reading and writing. According to Suhor, thinking skills help construct meaning and act as a good basis of several aspects of writing, such as expressing logical ideas as well as portraying continuity and cohesion, etc.

Due to the significance of thinking skills, several researchers incorporate teaching thinking skills in their language classes. For instance, Krataitong (2009) has developed a language course based on a standards-based curriculum using a backwards design process to enhance analyzing and analytical reading abilities of lower secondary students. The participants were 20 lower secondary students in a secondary school under the jurisdiction of Office of Fundamental Education Commission in Bangkok, Thailand. The research findings have indicated that, before learning through the course, 12 students were at the poor level and eight students were at the intermediate level in analytical ability. However, after learning through the course, 15 students were at the good level and five students were at the excellent level in analytical ability. Besides, before learning through the course, 12 students were at the poor level and eight students were at the intermediate level in analytical reading ability. However, after learning through the course, ten students were at the good level and ten students were at the excellent level in analytical reading ability. This suggests that a course that focuses on promoting thinking as well

as language skills can lead to success in thinking as well as language ability development.

Similarly, Fahim and Sa'eepour (2011) have conducted an experimental study to investigate the impact of teaching critical thinking skills on reading comprehension of Iranian EFL learners. The participants were 60 intermediate students (30 students assigned to the experimental group and the other 30 students assigned to the control group). During the study, the experimental group learned through the eight-session-treatment using debate as a classroom activity. The post-test results showed a significant difference between the two groups on the reading comprehension test, but not on the critical thinking test. Despite the insignificant difference on the critical thinking test, the research findings indicated that teaching critical thinking skills could promote language learning among EFL learners.

To conclude, as earlier discussed, thinking skills play a significant role in development of academic skills and language skills. That is to say, thinking skills help develop students' mental process which is one of keys to success in academic studies. Furthermore, thinking skills have a positive impact on language skill development. Teaching thinking skills, therefore, helps improve language learning.

That is why several language practitioners have adopted teaching thinking skills in a language class as exemplified in the research studies illustrated above.

2.5.4 Assessing Thinking

King et al. (1998) have discussed the item/test formats that can be used in assessing higher order thinking skills. The item/test formats are 1) selection (multiple-choice, matching), 2) generation (short answer, essay, performance), and 3) explanation (giving reasons for selection or generation of a response).

1) Multiple-choice items

Multiple-choice items can be used in assessing micro- or sub-skills of higher order skills, such as identifying the author's purpose or making an inference.

However, they have been criticized for placing too much focus on factual knowledge and the application of procedures to solve well-structured and decontextualized problems.

2) Performance tests

Performance tests include hands-on tasks (e.g., laboratory problems), short-answer constructed-response measures essays, and portfolios. Due to the critiques on some weaknesses of multiple-choice items, performance tests have been proposed as alternatives. According to King et al. (1998), performance tests can be considered domain-specific measures. They can also be authentic since they are

associated with instruction and can be used as effective examples of teaching procedures. Furthermore, performance tests involve real-life problems which require students' higher order thinking skills in finding their solutions and bring about their interest and motivation. Nonetheless, performance tests have been criticized for their limitations. That is, they can be time-consuming and costly. Apart from that, they have been criticized for their lack of generalizability.

3) Portfolios

Portfolios refer to collections of student assignments and projects which have been gathered for a continuous period of time and can be reviewed by teachers. Portfolios can be used to assess students' higher order thinking skills since they can contain real-world assignments which encourage students to use their higher order thinking skills in completing them. Weaknesses of the use of portfolios in formal assessment may include a labor-intensive process in scoring and questions about the authorship of portfolio entries.

To summarize, multiple-choice items, performance tests, and portfolios can be used in assessing higher order thinking skills. Multiple-choice items can be beneficial in assessing sub-skills of higher order skills, but may be considered decontextualized measures which rely too much on factual knowledge. To cope with

the disadvantages of multiple-choice items, performance tests have been suggested to serve as authentic measures. Nevertheless, they may be time-consuming and require a large amount of budget. Like performance tests, portfolios contain assignments that allow students to use thinking skills in higher levels, but the collection of assignments have to be gathered over a long period of time, such as a semester. Since they include a group of students' assignments and projects, they may be criticized for the need of a labor-intensive process in scoring.

2.6 Related Research on CLIL Implementation

Related research on CLIL implementation have portrayed the effectiveness of CLIL on foreign language learning in many levels of education. In the primary level, Blasco (2011), for example, explored the results of implementing a CLIL program in a Catalan primary school three years after the onset of the implementation. The main objective of this investigation was to determine the effects of CLIL on students' L2 English oral performance in terms of *Complexity*, *Accuracy*, and *Fluency* (CAF) by means of analytic measures. The research instruments used to analyze students' oral skills included two different tasks: an oral interview and a narrative task. The results obtained from the analysis suggested that CLIL learners outperformed non-CLIL learners of the same ages not only in fluency but also in syntactic complexity. This showed how CLIL could contribute to language development of second language

learners. However, in spite of the positive results, the study concluded that in order to confirm the study results, further research should emphasize the amount of input constant between CLIL and non-CLIL groups, as well as try to overcome some of the methodological limitations observed in the study.

Apart from the primary level, CLIL has shown its success in foreign language learning in the secondary level. For instance, Lasagabaster (2008) has conducted a study to investigate the impact of the CLIL implementation on students' foreign language competence. The study was undertaken in the Basque Country (Spain), a bilingual community in which both Basque and Spanish are official languages and where English is considered the third language included in the curriculum. The participants were 198 secondary students who were enrolled in four different schools at the age of eight. The instruments included English Tests, which comprised grammar, listening, speaking, and writing tests. The results showed that the CLIL groups significantly outperformed the non-CLIL group in every single test as well as in the overall English competence score. The results have portrayed how the CLIL approach is effective to improve students' foreign language competence even in bilingual contexts where English has little social presence.

Like Lasagabaster (2008), the positive results of CLIL implementations on students' speaking ability can also be found in the research study conducted by Várkuti (2010). This research study aimed to compare English language achievement of CLIL secondary school students (the experimental group) with that of non-CLIL intensive foreign language learners (the control group). The students in the experimental group were 816 students from eight different Hungarian-English secondary school bilingual teaching units (schools, classes, or groups), who were randomly chosen, while the students in the control group were 631 students from nine randomly chosen mainstream monolingual secondary schools that took part in intensive English language programs which met the CLIL standard. The two-part English language competence test was designed to measure conversational and academic language use (BICS and CALP). The research results indicated that CLIL students had a higher level of the social and academic language competence than that of the control group. The findings help prove that English as a tool of learning a subject matter can promote functional language proficiency more effectively than traditional foreign language instruction.

The effectiveness of CLIL implementations at the university level has also been documented. For example, Phoodokmai (2011) explored the effectiveness of

the CLIL course on reading and writing skills of 24 undergraduate science students' in the Thai context. The findings obtained from an achievement test revealed the students' significant improvement in their reading and writing skills after the course implementation. Besides, the findings gained from the learning log showed the students' positive opinions toward the course.

Likewise, Suwannoppharat (2014), for example, incorporated the principles of the CLIL approach into the course to enhance cultural awareness and English communication ability of Thai students in the Chinese International Program. According to the findings from the pre- and post-tests, the 24 students' English communication ability significantly improved after the course implementation. Furthermore, the findings from the formative assessment processes revealed that the students had a higher degree of improvement in their individual writing tasks after learning from the feedback for the group writing tasks as well as the discussion with their classmates and the instructor. Apart from that, the results from the opinion evaluation questionnaire indicated the students' positive opinions toward the CLIL course.

In research conducted overseas by Chostelidoua and Grivab (2014), the effects of the CLIL accountancy program in the Greek context was examined in terms

of development of reading skills as well as content knowledge. The findings from a CLIL test illustrated that the CLIL group (N=139) significantly outperformed the non-CLIL group (N=131) in both reading skills and the subject-specific content. Moreover, according to the data from the students' interviews, the CLIL group expressed the higher positive opinions toward the course than their peers in the non-CLIL group.

At Asian context, Tai (2015) investigated L2 writing development of Taiwanese undergraduate students in terms of syntactic complexity, accuracy and fluency after taking an 18-week CLIL class by analyzing 57 written assignments from the class across three different times (the beginning, the middle, and the final phase of the course). The findings indicated that, throughout the semester, the 19 Taiwanese undergraduate students in an elective CLIL course concerning intercultural communication developed their writing skill in terms of accuracy and fluency, though not complexity. This suggested that CLIL is effective for L2 writing development to some extent.

As illustrated above, the implementations of CLIL in various contexts help prove the effectiveness of the approach on foreign language learning. According to the findings of the research studies previously mentioned, CLIL practice can lead to improvement of students' subskills of the language, such as writing, speaking, and

listening skills, and helps enhance students' conversational as well as academic language use. In addition to language outcomes, CLIL is beneficial in terms of content as well as cultural aspects. The approach also results in the positive opinions of the students participating in the CLIL course. For these reasons, it can be concluded that CLIL is an approach which should be adopted in order to promote language skills, content knowledge, and cultural knowledge among learners who are learning English as a second or foreign language.

The aforementioned five main concepts which include CLIL, language course development, reading ability, writing ability, and thinking abilities help conceptualize the framework of a CLIL course to enhance English language abilities, agricultural knowledge, and cultural content of undergraduate students as summarized in the following Figure 5.

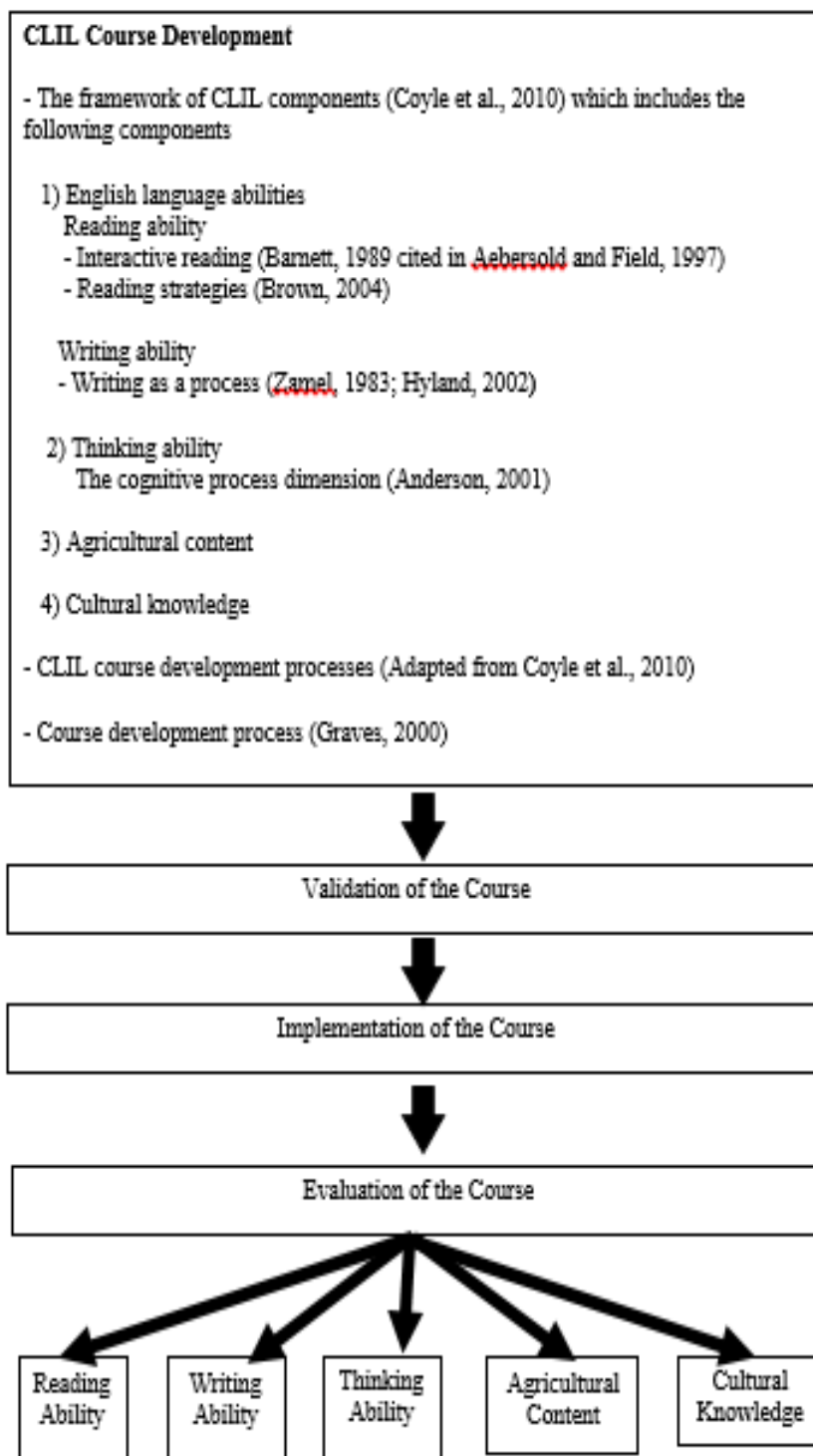


Figure 5: Conceptual Framework of the Study

Chapter 3

Research Methodology

3.1 Research Design

This study was a mixed-method research study which employed a one-group pretest-posttest without randomization design. The intact group of subjects was measured before and after learning through the treatment (the CLIL course).

3.2 Population and Sample

The population of this study was the second-, third-, and fourth-year undergraduate students from the Faculty of Agricultural Technology at King Mongkut's Institute of Technology Ladkrabang, Bangkok who had taken the two compulsory English courses: Foundation English 1 and Foundation English 2 and were taking the English for Academic Purposes course. Their ages were between 18 and 21 years old, and there were both male and female students. Their native language was Thai, and the level of their English language proficiency ranged from pre-intermediate to intermediate.

The sample group for the study was an intact group consisting of 27 undergraduate students from the Faculty of Agricultural Technology, who were taking the English for Academic Purposes course, and were required to pass the Foundation

English 1 and Foundation English 2 courses before taking the EAP course. The purposive sampling was used to obtain the participants. This was because the students were enrolled in the course in order to be prepared for academic success in their subsequent courses, as well as in their prospective work, so they needed to be equipped in terms of the content knowledge in their major area of study as well as of language development, which was the main focus of a CLIL course. Thus, such a group of students had particular characteristics of the population of interest, which would help answer the research questions of the present study.

3.3 Research Procedures

The research procedures were divided into two phases: Phase 1: course development which included a needs analysis, course development, and validation and evaluation of the developed course, and Phase 2: course implementation and evaluation of the effectiveness of the course.

3.3.1 Phase 1: Course Development

In the first phase, there were three major steps to be followed. This included Step 1: needs analysis, Step 2: course development, and Step 3: validation and evaluation of the developed course. The details of the three steps are as follows:

3.3.1.1 Step 1: Needs Analysis

In the first step, a needs analysis was conducted to elicit data regarding the needs for English language skills (reading and writing skills), thinking skills, agricultural content, cultural knowledge, and opinions toward developing a CLIL course to enhance English language abilities, as well as agricultural content and cultural knowledge of undergraduate students. To collect the data, the two research instruments, questionnaires, and interview protocols, were designed and utilized.

1) Participants

The participants of the study consisted of five groups of individuals who were undergraduate students at the Faculty of Agricultural Technology, ESP instructors, content instructors, employees in agribusiness, and employers in agribusiness.

1.1) Undergraduate students from the Faculty of Agricultural Technology

The sample size was 120 first- to fourth-year undergraduate students at the Faculty of Agricultural Technology at King Monkut's Institute of Technology Ladkrabang (KMITL), who were recruited to participate in the study based on a voluntary basis. Yamane's sample size table with $\pm 10\%$ variance (Yamane, 1973) was used to determine the sample size. The population was composed of 2,547 first-

to fourth-year undergraduate Agricultural students (investigated by Office of Registrar of the Faculty of Agricultural Technology, KMITL, on August 26, 2013), and, according to Yamane's sample size table, the appropriate sample size should be at least 96.

1.2) ESP instructors

All English language instructors at the Faculty of Industrial Education at King Mongkut's Institute of Technology Ladkrabang were recruited by using the purposive sampling technique. Since almost all of them had had experience teaching undergraduate students at the Faculty of Agricultural Technology, those who were the student participants of the needs analysis procedure, it was highly likely for them to have thorough understanding about the needs for the students' English language abilities and their specific needs. All the 18 ESP instructors working at the Faculty of Industrial Education at King Mongkut's Institute of Technology Ladkrabang were included as the participants of this phase of the study.

1.3) Content instructors in the field of agriculture

Three content instructors at the Faculty of Agricultural Technology were recruited to take part in the study. Since the field of agriculture is associated with the selection, breeding, and management of crops as well as animals

for economic production (Gupta & Gupta, 2002), it involves the three major sub-fields, namely, principles of plant production, principles of animal production, and principles of agricultural economics. In order to obtain the preliminary data for developing the CLIL course for undergraduate students majoring in the three sub-fields of agriculture, an expert in each of the three sub-fields was included in the study. That is, one was an expert in the field of principles of crop production, another was an expert in the field of principles of animal production, and the other was specialized in the field of principle of agricultural economics. Consequently, they were recruited to take part in the study by means of the purposive sampling technique to make sure that they had the information needed for the study.

1.4) Employees in agribusiness

Employees working at different organizations in agribusiness were included in the study. The inclusion criteria were as follows: they had to possess at least a Bachelor's of Science with concentration in a field of agriculture and had been working in companies or factories that were part of the agribusiness. They were recruited by using the purposive sampling technique to make sure that they had the information needed for the study. The sample size was 101 employees in agribusiness. The sample size of at least 100 participants was determined based on

the suggestion made by Frankel and Wallen (2000) that the minimum number of subjects appropriate for a descriptive research study is 100.

1.5) Employers in agribusiness

Three employers working at different organizations in agribusiness were included in the study. They had to be in an administrative position in a company or factory that was in the agribusiness. As previously mentioned, the field of agriculture is associated with the three main sub-fields: plant production, animal production, and principles of agricultural economics, the three employers whose work was related to the three major sub-fields were recruited into the study. That is to say, one employer was working in the field of plant production, another employer was responsible for his work in the field of animal production, and the other employer was in charge of sales administration, which could be categorized in the field of agricultural economics. Due to the fact that their jobs concerning the three main areas of an agricultural field, they could be assumed that they had the preliminary data for developing the CLIL course for undergraduate students majoring in the three sub-fields of agriculture. As a consequence, it could be said that the three participants were recruited by using the purposive sampling technique to make sure that they possessed the information needed for the study.

2) Instruments

The two research instruments used in conducting the needs analysis included a) A Needs Analysis Questionnaire which was used to elicit the data from undergraduate students from the Faculty of Agricultural Technology, ESP teachers, and employees in agribusiness, and b) An Interview Protocol, which was employed to obtain the data from undergraduate students from the Faculty of Agricultural Technology, ESP teachers, employees in agribusiness, content teachers, and employers in agribusiness.

2.1) A Needs Analysis Questionnaire

The questionnaire was designed to elicit data regarding the needs for English language skills (reading and writing skills), thinking skills, agricultural content, cultural knowledge, and opinions about developing a CLIL course to enhance English language abilities, agricultural content, and cultural knowledge of undergraduate students from the three groups of participants, namely, Agricultural Technology students, ESP teachers, and employees in agribusiness. The questionnaire includes eight parts, as follows:

Part A: Demographic Information and English Language Abilities
(Reading and Writing Abilities) in Agricultural Contexts

For all the three groups of the participants, Part A elicited the data concerning the participants' demographic characteristics and English language abilities (reading and writing abilities) in agricultural contexts of Agricultural Technology.

For undergraduate students at the Faculty of Agricultural Technology, the items elicited the data regarding the participants' demographic characteristics including their gender, age, academic year of their study, major field of study (e.g., Agricultural Development, Agriculture, or Animal Science), number of years studying English in school, Foundation English 1 and Foundation English 2 grades, and their perception of their English language abilities.

For ESP instructors, the items elicited data concerning the participants' demographic characteristics including their gender, age, and the number of years teaching ESP courses to undergraduate students at the Faculty of agricultural Technology.

For employees in agribusiness, the items elicited data regarding the participants' demographic characteristics including their gender, age, major field of study (e.g., Agricultural Development, Agriculture, or Animal Science), number of years studying English in school, number of years working in agribusiness, their

position, number of years of working in that position, and their perception of the English language abilities.

The items in the questionnaire consisted of both response-choice items and open-ended items.

As for the response-choice items, each group of the participants was asked to choose the responses provided, as follows:

(1) The student participants were asked to tick only one box in the space provided to report on their gender, their major field of study, and number of years studying English in school. Besides, the participants were asked to choose only one box under the five categories of each skill: “very good,” “good,” “fair,” “poor,” or “very poor” to report on their perception of the English language abilities.

(2) The instructor participants were asked to choose only one box in the space provided to report on a number of years teaching ESP courses to undergraduate students at the Faculty of Agricultural Technology.

(3) The employee participants were asked to tick only one box in the space provided to report on their gender, their major field of study, number of years studying English in school, a number of years working in agribusiness, and number of years working in that particular position. Apart from this, the participants

were asked to select only one box under the five categories of each skill: “very good,” “good,” “fair,” “poor,” or “very poor” to report on their perception of their own English language abilities.

As for the open-ended items, each group of the participants was asked to fill in the information in the space provided, as follows:

(1) The student participants were asked to fill in the information in the space provided to report on their age, the academic year of their study, and their Foundation English 1 and Foundation English 2 grades.

(2) The employee participants were asked to fill in the information in the space provided to report on their position.

Part B: English Reading Skills, English Writing Skills, and Common Text Types in Expository Writing in Agricultural Contexts.

This part contained the three sub-parts which were Part B1: English Reading Skills in Agricultural Contexts, Part B2: English Writing Skills in Agricultural Contexts, and Part B3: Common Text Types in Expository Writing in Agricultural Contexts.

Thus, for all the three groups of the participants, Part B elicited the data regarding the importance of the three aspects of English language skills,

namely, English reading skills (Part B1), English writing skills (Part B2), and common text types in expository writing in agricultural contexts (Part B3), for Agricultural Technology students/employees in agribusiness, as follows:

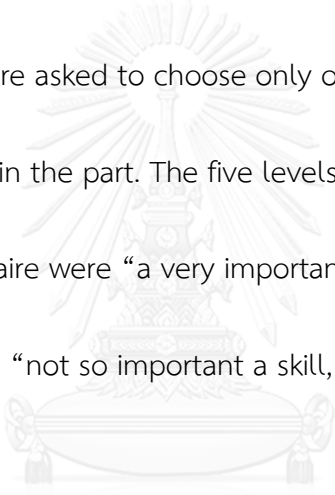
Part B1 elicited the data regarding the importance of English reading sub-skills. The items included 1) skimming the text for main ideas, 2) scanning the text for specific information, 3) analyzing vocabulary, 4) making a reference, 5) making an inference, and 6) identifying the author's purposes.

Part B2 elicited the data regarding the importance of English writing sub-skills and the three major steps in the writing procedures. The items concerning English writing sub-skills included 1) expressing content, 2) making an organization, 3) selecting appropriate vocabulary, 4) using language correctly and appropriately, and 5) using correct mechanics including spelling, punctuation, and capitalization. The items concerning the major steps in the writing procedures included 1) outlining, 2) writing, and 3) editing.

As for Part B3, the items in this part elicited the data regarding the importance of common text types in expository writing in agricultural contexts. The items included 1) description (e.g. describing plant parts or soil components), 2) process (e.g. describing how to breed and make breed improvement), 3) comparison

and contrast (e.g. comparing and contrasting particular plants), 4) cause and effect (e.g. explaining causes and effects of breeding and making breed improvement), and 5) problem and solution (e.g. describing a particular production problem in agribusiness and discussing possible solutions to the problem).

To report on the importance of English reading skills, English writing skills, and common text types in expository writing in agricultural contexts in Part B, the participants were asked to choose only one box under the five levels of importance on each item in the part. The five levels of the importance of the items in Part B of the questionnaire were “a very important skill,” “an important skill,” “quite an important skill,” “not so important a skill,” and “not an important skill at all”



Part C: Thinking Skills

For all the three groups of the participants, Part C elicited the data regarding the importance of the six levels of thinking skills, which included ‘remember,’ ‘understand,’ ‘apply,’ ‘analyze,’ ‘evaluate,’ and ‘create.’

To report on the importance of the six levels of thinking skills, the participants were asked to select only one box under the five levels of importance on each item in the part. The five levels of importance of the items in

Part C of the questionnaire were “a very important skill,” “an important skill,” “quite an important skill,” “not so important a skill,” and “not an important skill.”

Part D: Agricultural Content

For all the three groups of the participants, Part C elicited the data regarding the importance of each of the topics in the three sub-fields of agricultural content, which were 1) principles of crop production, 2) principles of animal production, and 3) principles of agricultural economics. The topics of each of the three sub-fields of agricultural content were, namely, 1) principles of crop production: biology related to plants, origin and classification of the cultivated crops, plant introduction, crop improvement and propagation, the influences of environmental factors on crop production, harvesting, storage, and processing and marketing of the products; 2) principles of animal production: farm management, feeds and feeding, breeds and breed improvement, hygiene and disease prevention, processing, and importance of animal industry; and 3) principles of agricultural economics: the principle of agricultural economics and its applications in agricultural production, consumption, marketing, organization and agribusiness, land tenure, credit and other related problems, Thai agricultural structure, gross national products, and agricultural development.

To report on the importance of the topics of each of the three sub-fields of agricultural content, the participants were asked to choose only one box under the five levels of importance on each item in the part. The five levels of importance of the items in Part C of the questionnaire were “a very important topic,” “an important topic,” “quite an important topic,” “not so important a topic,” and “not an important topic at all.”

Part E: Cultural Knowledge

For all the three groups of the participants, Part C elicited the data regarding the importance of the sub-topic areas of cultural knowledge (products, practices, and perspectives), and of the knowledge about ourselves (Thailand as a whole and specific parts of Thailand) and others (ASEAN and beyond ASEAN), for Agricultural Technology students/employees in agribusiness. The first part of Part C elicited the data regarding the importance of the sub-topic areas of cultural knowledge, which were 1) information about products in agricultural contexts (such as plants, animals, or agricultural tools), 2) information about practices that members of the culture carried out individually or with others in agricultural contexts (such as agricultural irrigation that a member or members of the culture carried out), and 3) information about perspectives in agricultural contexts, which could be the

perceptions, beliefs, values, or attitudes that underlined the products and that guided persons and communities in the practices of the culture (such as attitudes of the members of the culture on farming). Also, the second part of Part C elicited the data about the importance of the knowledge about ourselves (Thailand as a whole and specific parts of Thailand) and others (ASEAN and beyond ASEAN), which included 1) cultural knowledge in agricultural contexts in Thailand as a whole (such as agricultural irrigation carried out in Thailand as a whole), 2) cultural knowledge in agricultural contexts in specific parts of Thailand (such as agricultural irrigation carried out in the central part or the southern part of Thailand), 3) cultural knowledge in agricultural contexts in member countries of ASEAN (such as agricultural irrigation carried out in member countries of ASEAN), and 4) cultural knowledge in agricultural contexts in countries beyond ASEAN (such as agricultural irrigation carried out in countries beyond ASEAN).

To report on the importance of the sub-topic areas of cultural knowledge (products, practices, and perspectives), and of the knowledge about ourselves (Thailand as a whole and specific parts of Thailand) and others (ASEAN and beyond ASEAN), the participants were asked to select only one box under the five levels of importance on each item in the part. The five levels of importance of the

items in Part C of the questionnaire were “a very important area,” “an important area,” “quite an important area,” “not so important an area,” and “not an important area at all.”

The evaluation criteria of Parts B, C, D, and E of the questionnaire were as follows:

4.51 – 5.00	meant the item was ‘very important.’
3.51 – 4.50	meant the item was ‘important.’
2.51 – 3.50	meant the item was ‘quite important.’
1.51 – 2.50	meant the item was ‘not so important.’
1.00 – 1.50	meant the item was ‘not important at all.’

Part F: Opinions about Developing the CLIL Course for Undergraduate Students at the Faculty of Agricultural Technology

For all the three groups of the participants, Part F elicited data regarding the participants’ opinions about developing the CLIL course to enhance English language abilities, agricultural knowledge, and cultural content of undergraduate students in terms of agricultural content, cultural knowledge, and teaching and learning methods and activities.

To report on their opinions, the participants were asked to select only one box to indicate their agreement or disagreement with the questionnaire items. The five levels of agreement used in Part F of the questionnaire were “strongly agree,” “agree,” “neutral,” “disagree,” and “strongly disagree.”

The evaluation criteria of Part F of the questionnaire were as follows:

4.51 – 5.00 meant the participants ‘strongly agreed’ with the item.

3.51 – 4.50 meant the participants ‘agreed’ with the item.

2.51 – 3.50 meant the participants ‘neither agreed nor disagreed’ with the item.

1.51 – 2.50 meant the participants ‘disagreed’ with the item.

1.00 – 1.50 meant the participants ‘strongly disagreed’ with the item.

Part G: Suggestions and Expectations for Developing the Content and Language Integrated Learning (CLIL) Course to Enhance English Language Abilities, Agricultural Content, and Cultural Knowledge of Undergraduate Students

For all the three groups of the participants, Part G provided the participants an opportunity to express their suggestions and expectations for a CLIL course to enhance English language abilities, agricultural knowledge, and cultural content of undergraduate students in the form of one open-ended question.

To overcome the language barrier and to ensure mutual understanding between the interviewees and the interviewer (the researcher), the seven parts of questionnaires were written in Thai.

2.2) An Interview Protocol

The semi-structure interview protocol was designed to collect in-depth information on the needs for English language skills (reading and writing skills), thinking skills, agricultural content, cultural knowledge, and opinions about developing a CLIL course to enhance English language abilities, agricultural content, and cultural knowledge of undergraduate students. Five groups of participants were interviewed, namely, ten undergraduate students from the Faculty of Agricultural Technology, three ESP instructors, three content instructors, ten employees in agribusiness, and three employers in agribusiness. The interview protocols were used to gain further information from what had previously been elicited with the questionnaire.

3) Validation of the instruments

After the instruments used in the needs analysis process had been designed, they were validated in the following process:

3.1) Examining content validity

The content validity of the questionnaire as well as that of the interview protocol was examined by three experts in the field of agriculture, language assessment and evaluation, and ESP teaching. In so doing, the index of item objective congruence (IOC index) was employed.

In order to calculate the agreement of the experts, a checklist marking 'agreeable,' 'not sure,' and 'disagreeable' was distributed to the three experts. To consider the questionnaire valid, agreement of at least two of the experts was needed (Booncherd Pinyoanatha, 1983 in Thai บุญเชิด ภิญโญอนันต์พงศ์, 2526). To yield the content validity of the questionnaire, the validation score had to be at least 0.5.

3.2) Reviewing

After the three sets of the questionnaire and the interview protocol had been returned by the experts, the instruments were reviewed and adjusted based on their comments and suggestions.

3.3) Conducting the pilot study

After reviewing the instruments, the two sets of the questionnaire were distributed to the 30 student participants and the 30 employee participants in the pilot study, whose demographic characteristics were similar to those of the participants of the main study, in order to examine the reliability of the questionnaire. However, as for the set of questionnaire for the ESP instructor participants, due to the small size of the participants available, it was difficult to separate some of them to be the sample of the pilot study to determine the reliability of the questionnaire. Hence, the pilot study of the questionnaire for the ESP instructor participants was not conducted. In terms of statistics, in order to determine the reliability of the questionnaire, the reliability was verified by using Cronbach's Alpha Coefficient, which was considered the formula appropriate for the rating scale data (Prakong Kunnasut, 1992 in Thai ประคอง กรรณสูต, 2535). The reliability of the questionnaire for Agricultural Technology students and for employees in agribusiness was 0.8795 and 0.8810, respectively.

4) Data Collection Procedure

To gain insights into the needs for English reading and writing abilities of Agricultural Technology students, the data were gathered in the following procedure:

4.1) Distributing the questionnaire

The three sets of the questionnaires were distributed to the three groups of the participants, namely, 120 undergraduate students from the Faculty of Agricultural Technology, 18 ESP teachers, and 101 employees in agribusiness.

4.2) Conducting the interviews

After analyzing the three sets of the questionnaires, ten undergraduate students from the Faculty of Agricultural Technology, three ESP teachers, ten employees in agribusiness, three content instructors, and three employers in agribusiness were interviewed. The purposive sampling technique was adopted at this stage to make sure that the participants were able to share the information needed.

5) Data Analysis

5.1) A Needs Analysis Questionnaire

The data from the three sets of the questionnaire were then analyzed. To be specific, the data obtained from Parts A, B, C, D, E, and F were analyzed by means of descriptive statistics (percentage, mean, standard deviation), while the data gathered from the open-ended question from Part G were analyzed by means of content analysis.

5.2) An Interview Protocol

Content analysis was used to analyze the data obtained from the interviews. That is, after the data from the audio recording were transcribed and grouped according to the interview questions, the similarities and differences of the responses were tallied, categorized, and reported.

3.3.1.2 Step 2: Course Development

In the second step of the first phase, several sub-steps were followed in order to develop the CLIL course. In this step, the information gathered from the needs analysis was interpreted and transferred into the course objectives, content, and teaching activities.

In order to develop the CLIL lesson plans and supplementary materials, the steps that had to be taken are as follows:

1) reviewing CLIL theoretical frameworks and CLIL course

development process

2) reviewing literature on reading and writing

3) reviewing literature on thinking, and

4) Specifying important findings from the needs analysis.

At this stage, the findings from the needs analysis were specified on the basis of the four components of the CLIL approach applied in this study, namely,

1) English language abilities (English reading and writing abilities), 2) thinking ability, 3) agricultural content, and 4) cultural knowledge.

1) English language abilities

1.1) English reading ability

In this study, English reading ability referred to the skills including skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose. Thus, such skills were transferred into the CLIL course as the foci of the CLIL lessons in terms of reading. Besides, based on the findings from the needs analysis procedure, 'skimming the text for main ideas' was taken into account when designing the CLIL lessons. This was because such a skill was perceived as the most

important English reading skill among all the three groups of the questionnaire participants as well as the five groups of interview participants.

1.2) English writing ability and common text patterns

found in expository writing in agricultural contexts

a) English writing ability

In terms of writing, in this study, English writing ability referred to the skills including expressing content, making an organization, selecting appropriate vocabulary, using language correctly and appropriately, and having no problem in spelling, punctuation, and capitalization. As a result, such skills were included in the CLIL lessons in terms of writing. Also, the needs analysis findings by means of both the questionnaire and the interviews revealed that ‘expressing content’ and ‘making an organization’ were perceived as the most important English writing skills. Therefore, the two skills were taken into considerations when the CLIL lessons were developed.

b) Common text patterns found in expository

writing in agricultural contexts

When it came to common text patterns found in expository writing in agricultural contexts, two text patterns were selected so that

students would have a chance to practice writing each of the text patterns in the three units. Since the data obtained from the questionnaire did not concur with those obtained from the interviews, 'problem and solution' and 'process' were prominent based on the findings gained from the questionnaire, whereas 'causes and effects' was mentioned in the interviews as the most important text pattern among ESP instructor participants, content instructor participants, and employee participants. In this study, the 'process' text pattern and the 'cause and effect' text pattern were selected. This was because 'process' was ranked first by instructor participants and employee participants, while 'problem and solution' was ranked first by student participants. The 'process' text pattern was selected with respect to the opinions of ESP instructor participants who had been in charge of teaching ESP courses for Agricultural Technology students and those of employee participants who had been experienced in agribusiness. Apart from the 'process' text pattern, the 'cause and effect' text pattern was selected regarding the findings from the interviews which indicated that such a text pattern was perceived as the most important text pattern among ESP instructor participants, content instructor participants, and employee participants.

2) Thinking ability

In this study, thinking ability referred to low and higher abilities of thinking based on a Revision of Bloom's Taxonomy of Educational Objectives proposed by Anderson et al. (2001, pp. 67-68), which include six main levels of thinking, which are 1) 'remember,' 2) 'understand,' 3) 'apply,' 4) 'analyze,' 5) 'evaluate,' and 6) 'create.' Hence, such levels of thinking were encompassed into the CLIL lesson. In addition, based on the data gathered from both the questionnaire and the interviews, 'understand,' which was perceived as the most important thinking skill, was taken into account when the CLIL lessons were designed.

3) Agricultural content

3.1) Principles of plant production

As for principles of crop production, 'the influences of environmental factors on crop production' was selected due to the fact that the sub-topic was prominent in the opinions portrayed through the questionnaire as well as the interviews. That is to say, 'the influences of environmental factors on crop production' was claimed by employee participants as the most important sub-topic based on the data collected from the questionnaire, while the sub-topic was

perceived by employer participants as the most important sub-topic based on the data gained from the interviews.

3.2) Principles of animal production

In terms of principles of animal production, since several sub-topics, such as ‘breeds and breed improvement,’ ‘hygiene and disease prevention,’ and ‘processing,’ were mentioned as the most important sub-topics based on the data obtained from the questionnaire, ‘farm management’ was selected with respect to the findings from the interviews which suggested that such a sub-topic was cited by student participants, a content instructor participant, and employee participants as the most important sub-topic in terms of principles of animal production.

3.3) Principles of agricultural economics

As for principles of agricultural economics, ‘marketing’ was selected because it was perceived as the most important sub-topic among student participants and employee participants based on the data gathered from the questionnaire, as well as the four groups of participants, except ESP instructor participants, based on the data gained from the interviews.

4) Cultural Knowledge

4.1) Importance of cultural knowledge in terms of the sub-topic areas

As for sub-topic areas of cultural knowledge (products, practices, and perspectives), according to the data gained from the questionnaire as well as from the interviews, cultural knowledge about ‘products,’ cultural knowledge about ‘practices,’ and cultural knowledge about ‘perspectives’ were all mentioned as the most important sub-topic areas for Agricultural Technology students as well as for employees in agribusiness. Consequently, cultural knowledge about all the three aspects, namely, ‘products,’ ‘practices,’ and ‘perspectives’ were incorporated into the CLIL lessons.



4.2) Importance of cultural knowledge in terms of knowledge about ourselves and others

When it came to the importance of cultural knowledge, knowledge about ourselves and others (Thailand as a whole and specific parts of Thailand) and others (ASEAN and beyond ASEAN), the findings from the questionnaire as well as the interviews showed that cultural knowledge in agricultural contexts in ‘Thailand as a whole,’ cultural knowledge in agricultural contexts in ‘ASEAN

countries,’ and cultural knowledge in agricultural contexts in ‘specific parts of Thailand’ were cited as the most important sub-topic of cultural knowledge. That is, regarding the data gained from the questionnaire as well as from the interviews, cultural knowledge in agricultural contexts in ‘Thailand as a whole’ was claimed as the most important sub-topic of cultural knowledge. Apart from that, based on the suggestions provided in development of the CLIL course gathered from the questionnaire, cultural knowledge in agricultural contexts in ‘ASEAN countries’ was focused by students participants due to the important role of the ASEAN Economic Community (AEC), while, based on the data gathered from the interviews, cultural knowledge in agricultural contexts in ‘specific parts of Thailand’ was stated by ESP instructor participants as the most important sub-topic area. As a consequence, cultural knowledge in agricultural contexts in the three aspects, namely, cultural knowledge in agricultural contexts in ‘Thailand as a whole,’ that in ‘ASEAN countries,’ and that in ‘specific parts of Thailand’ were all integrated into the CLIL lessons.

5) Collaborating with instructors at the Faculty of Agricultural Technology by following the stages adapted from CLIL course development processes of Coyle et al. (2010), as follows:

5.1) Construction of a shared vision

At this step, the researcher as a language instructor collaborated with the three subject teachers in the field of agriculture to come up with a shared vision for CLIL, the ideas of goals to be achieved when CLIL was in practice in the context of the study.

5.2) Analyzing and personalizing the context

In this step, a CLIL model was developed from the vision which had been clarified in the previous step. In this study, the model of a language-embedded content course was applied. According to such a model, the content would be conceptualized from the outset with the objectives of language development (Coyle et al., 2010). Specifying the model would help the CLIL instructor make a decision on many variables such as type and size of school, environment, and local and national policies.

5.3) Planning and preparing a lesson

In this step, a planning map for CLIL was adapted from the framework of CLIL proposed by Coyle et al. (2010). Based on the foci on English language abilities which covered English reading ability (including thinking ability) and writing ability, agricultural content, and cultural knowledge, there were four major

sub-steps in this step: *a) considering agricultural content, b) connecting agricultural content and English language abilities (English reading and writing), c) connecting agricultural content and thinking ability, and d) connecting agricultural content and cultural knowledge.*

3.1) Considering agricultural content

Since it was content that drove the entire lesson planning, the researcher had to consider whether there was a choice of content and which was the most proper in the situation. In this sub-step, the researcher also collaborated with the four subject instructors in the three sub-fields of agriculture, namely, principles of crop production, principles of animal production, and principle of agricultural economics, to determine the content to teach, as well as to identify the learning outcomes.

3.2) Connecting agricultural content and English language abilities (English reading and writing)

In this sub-step, the researcher considered how to deliver agricultural content to students and enable them to practice their English language abilities (English reading and writing) simultaneously.

3.3) Connecting agricultural content and thinking ability

As mentioned in Chapter 1, thinking (cognitive) processes were important in academic studies; as a result, in this sub-step, the researcher considered how to promote agricultural content and thinking ability simultaneously.

3.4) Connecting agricultural content and cultural knowledge.

In this sub-step, the researcher planned how to deliver cultural knowledge related to the agricultural content to students.

To be specific, in order to develop a CLIL lesson in this study, agricultural content was considered in the first place. As previously stated, an agricultural field involves three major areas, namely, principles of plant introduction, principles of animal introduction, and principles of agricultural economics, the results obtained from the needs analysis in terms of agricultural content in the three field were first considered. Since the course lasted twelve weeks, the agricultural content was conceptualized into six lessons under three aforementioned three areas of agricultural content.

In each lesson, after the agricultural content such as ‘environmental factors that affect plant growth’ in Unit 1, was selected, the content was connected with English language reading and writing abilities. In case of Unit 1, while the sub-topic of ‘environmental factors that affect plant growth’ was selected,

English reading sub-skills, such as skimming the text for main ideas and scanning the text for specific information, as well as English writing skills in producing a cause and effect paragraph were mapped up with the agricultural content. After connecting agricultural content with English language reading and writing abilities, how to promote agricultural content as well as thinking ability was considered. That is, each step of teaching agricultural content and English language abilities was conceptualized with the levels of cognitive domains, based on a Revision of Bloom's Taxonomy of Educational Objectives (2001). Next, the agricultural content was connected with cultural knowledge. As for Unit 1, 'Water Management in Northeast Thailand' was selected since it was associated with 'water' which was considered as one of the environmental factors that affected plant growth. Due to the fact that culture can be considered as the integral part of the content (Coyle et al., 2010), delivering cultural knowledge in each unit had to be conceptualized with the levels of cognitive domains, based on a Revision of Bloom's Taxonomy of Educational Objectives (2001) as well.

The CLIL course could be elaborated as follows:

- 1) Course Rationale

To help ESP students overcome reading and writing difficulty, appropriate course design is inevitably important. Among a wide range of educational approaches, the Content and Language Integrated Learning (CLIL) approach is an approach that can be used to develop a course for the teaching of the skill areas in English for Specific Purposes (ESP). Since CLIL is “a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language (Coyle et al., 2010, p. 3),” the approach makes students’ learning much more meaningful. It also corresponds with the claims made by Orr (2002) and Dudley-Evans Dudley-Evans and St John (1998) that the focus of ESP is placed on learners’ specific language needs in a particular context.

Apart from the two main foci, which are content and the target language, CLIL encompasses other components such as cognitive skills and culture. From the view of Coyle, Hood, and Marsh, the four major components of CLIL include a) *content*—the subject matters or curricular subjects taught in the target language, b) *communication*—the foreign language which learners learn as the target language, c) *cognition*—cognitive or thinking skills which drive the instructional process, and d) *culture*—understanding learners’ own culture and other cultures (sometimes viewed as *Community or Citizenship* (Bently, 2010).

In brief, CLIL is an educational approach that relies on the basis that the specific subject matters play a vital role in learning the target language. Nonetheless, apart from content and language, CLIL is made up of the other main components such as cognition and culture.

For the past few years, CLIL has played an important role in language teaching and learning. Besides the content outcomes, CLIL is effective in terms of students' language learning outcomes as it helps students improve their general language skills (Morgan, 2006) as well as their receptive and productive language skills, such as reading and writing (Dalton-Puffer, 2007). To illustrate, in the research project conducted by Admiraal (2006) in the Netherlands, the positive effects of CLIL were found on the students' language proficiency in English in terms of their oral proficiency and reading comprehension. Likewise, according to the findings of the research conducted by Lasagabaster (2008), the CLIL implementation in Spain, in which English is the third language, was successful in developing students' foreign language competence in terms of grammar, listening, speaking, and writing.

In addition to the language outcomes, CLIL is beneficial in terms of thinking skills and cultural knowledge. According to Coyle et al. (2010), CLIL

helps develop both low and higher order thinking skills which drive the process of learning, while also promoting learners' cultural knowledge in an interactive setting. Furthermore, based on University of Cambridge ESOL Examinations (University of Cambridge ESOL Examinations, 2009), CLIL is an approach that helps promote cognition/cognitive skills which enable learners to process information and develop their cultural understanding in order to respect one's own culture as well as others' cultures.

Due to the benefits and effectiveness of CLIL implementation as previously mentioned, CLIL is considered appropriate in an ESP class since it can help ESP students develop their language skills and other core components of learning, such as thinking skills, knowledge in their field of study, and cultural knowledge. Hence, to help undergraduate students enhance their language abilities with a special focus on reading and writing abilities, and their agricultural content and cultural knowledge, a Content and Language Integrated Learning (CLIL) course was taken into consideration and developed in the present study.

2) Design a scope and sequence

2.1) The goals/objectives of the course

The goals/objectives of the course were as follows:

1. Students would be able to understand the sub-topics of agricultural content.
2. Students would be able to find the main idea and interpret English reading texts in the field of agriculture.
3. Students would be able to write a paragraph in English in agricultural contexts with the cause and effect text type and the process text type.
4. Students would be able to apply their cognitive skills while learning the contents.
5. Students would be able to understand the cultural knowledge in agricultural contexts.

2.2) The course content

Based on the CLIL 4Cs Framework suggested by Coyle, Hood, and Marsh (2010) and the framework of conceptualizing content for syllabus design, mentioned by Graves (2000, pp. 27-31, 42-52), the content of the CLIL course was conceptualized on 1) agricultural content, 2) reading and writing skills, 3) thinking skills, and 4) cultural knowledge in agricultural contexts. That is to say, in each unit, both the sub-topic of agricultural content and cultural knowledge related to that particular sub-topic of agricultural content were delivered to students, and reading

and writing skills, as well as thinking skills, were promoted simultaneously. To be specific, in each unit, in order to deliver the sub-topic of agricultural content, in the first session, students were asked to read a reading passage/reading passages to gain understanding of the sub-topic of agricultural content as well as to practice their reading and thinking skills simultaneously. Key vocabulary related to the sub-topic of agricultural content was also discussed in this step. Next, students were asked to do a culture task to gain understanding of cultural knowledge related to the agricultural content they had learned as well as to practice their thinking skills. Then, in the second session, in order to deepen their understanding of the sub-topic of agricultural content and that particular sub-topic area of cultural knowledge, students were asked to write a cause and effect paragraph via the process writing approach (outlining, writing, and editing). The outline of the CLIL lesson plan could be seen as follows:

Table 1: Outline of the CLIL Lesson Plan

Session	Time Allocated	Phases Steps	Activities
1	15 minutes	<u>Phase 1: Lead in</u>	- Doing a lead in activities to direct students' attention and lead students to the sub-topic of agricultural content
1	2 hours 45 minutes	<u>Phase 2: Content Delivering</u>	
	1 hour 45 minutes	Step 1: Delivering the agricultural content and practicing the reading skills and the cognitive skills	- Doing reading tasks
	1 hour	Step 2: Delivering the cultural knowledge related to agricultural content, and practicing the cognitive skills	- Doing a culture task
2	2 hours 15 minutes	Step 3: Delivering the agricultural content and practicing the writing skills and the cognitive skills	- Doing a writing task
2	15 minutes	<u>Phase 3: Wrap-up</u> (15 minutes)	- Doing wrap-up activities to review what students have learned

The CLIL course consisted of six units, and each unit focused on one sub-topic of agricultural content. The class met once a week, and each unit lasted two

sessions (three hours per session). Thus, each unit took six hours, and there were

altogether 36 hours in the course. The CLIL course content was as follows:

Table 2: Summary of CLIL Course Content

Unit	Agricultural Content	Culture	Reading	Writing
1 (2 sessions; 6 hrs)	<i>Environmental Factors that Affect Plant Growth</i> (Principles of plant production)	Water Management in Northeast Thailand (Products and practices— ponds and water management in a specific part— Northeast of Thailand)	Skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose	- <u><i>Cause and effect paragraph</i></u> - <u><i>basic parts of a paragraph</i></u> - language focus: <u><i>using verbs to express cause and effect</i></u> (cause, affect, result in, lead to, and bring about) - writing assignment: <u><i>Effects of heavy rains on a watermelon plant</i></u>
2 (2 sessions; 6 hrs)	<i>Irrigation Methods</i> (Principles of plant production)	Irrigation in Thailand and Malaysia (Practices— irrigation practices in	Skimming the text for main ideas, scanning the text for specific information,	- <u><i>Process paragraph: how something works</i></u> - language focus 1: <u><i>transitional signals for process paragraph</i></u>

Table 2: Summary of CLIL Course Content (Cont.)

Unit	Agricultural Content	Culture	Reading	Writing
2 (Cont.)		ASEAN countries)	analyzing vocabulary, making a reference, and identifying the author's purpose	(to begin with, first, second, third, next, then, finally, in the end, lastly) - language focus 2: passive voice - writing assignment: How center pivot irrigation works
3 (2 sessions; 6 hrs)	<i>Site Selection for Poultry Farms</i> (Principles of animal production)	Good Agricultural Practices for Location and Layout of Chicken Breeder Farm: Thailand (Practices and products—practices and layout of a chicken farm in Thailand as a whole)	Skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose	<u>Process paragraph: how to do something</u> - language focus: <i>modal verbs (obligation, advice, possibility)</i> - writing assignment: <i>Making a plan on existing buildings of a poultry farm site</i>

Table 2: Summary of CLIL Course Content (Cont.)

Unit	Agricultural Content	Culture	Reading	Writing
4 (2 sessions; 6 hrs)	Poultry Housing (Principles of animal production)	Poultry Housing in Thailand (Practices—poultry housing practices in Thailand as a whole)	Skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose	Process paragraph: how to do something - language focus: imperatives (positive and negative) - writing assignment: How to build a chicken coop
5 (2 sessions; 6 hrs)	Marketing Setting: E-Marketing (Principles of agricultural economics)	The State of E-Commerce within the ASEAN Region (Practices and perspectives of online shoppers, including those of agricultural product)	skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference,	Cause and effect paragraph - language focus 1: coordinating conjunction 'so' - language focus 2: subordinating conjunctions 'because,' 'since,' 'as'

Table 2: Summary of CLIL Course Content (Cont.)

Unit	Agricultural Content	Culture	Reading	Writing
5 (Cont.)		online shoppers, in ASEAN countries)	and identifying the author's purpose	- writing assignment: <i>Positive effects of e-commerce on agribusiness</i>
6 (2 sessions; 6 hrs)	<i>The Marketing Mix</i> (Principles of agricultural economics)	The Marketing Mix: Thai Rice Export (Products, practices and perspectives of stakeholders in case of Thai rice export)	skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose	<u><i>Cause and effect paragraph</i></u> - language focus: cause and effect adverbial conjunctions (consequently, as a result, as a consequence, therefore, thus) - writing assignment: <i>Cultural impacts on marketing strategies of McDonald's</i>

3.3.1.3 Step 3: Verification and Evaluation of the Developed Course

In this step, the lessons plans and the supplementary materials were validated in the following process:

- 1) Examining the content validity

The content validity of the lesson plans was investigated by three experts in the field of ESP teaching. In so doing, the index of item objective congruence (IOC index) was calculated before conducting the pilot study. To calculate the agreement of the experts, a checklist marking 'agreeable,' 'not sure,' and 'disagreeable' was distributed to the three of them. In order to consider the questionnaire to be valid, agreement of at least two of the experts were needed (Booncherd Pinyoanantpong, 1983 in Thai บุญเชิด ภิญโญอนันตพงศ์, 2526), and the validation score had to be at least 0.5 in order to yield the content validity of the lesson plans.

2) Reviewing

After the lesson plans and the supplementary materials had been returned by the experts, the instruments were reviewed and revised according to the comments of the three of them.

Besides, to obtain the content validity in terms of agricultural content, each of the six lesson plans and the supplementary materials were examined by the expert in the field of the particular agricultural sub-topic. Then, each of the lesson plans and the supplementary materials were reviewed and revised according to the comments of the expert.

3) Conducting the pilot teaching

After the reviewing step, the pilot teaching was conducted. In so doing, the first lesson, which lasted about six hours (two sessions), was tried out with a group of about 15 Agricultural Technology students taking English for Academic Purposes (EAP) at King Mongkut's Institute of Technology Ladkrabang, who were not the participants of the main study. After that, the lesson plans were reviewed and revised in order to best suit specific nature of the participants.

3.3.2 Phase 2: Course Implementation and Evaluation

In the second phase, there were two major steps to be followed. This included Step 1: Implementing the course and Step 2: Evaluating the course.

3.3.2.1 Step 1: Implementing the Course

The course was implemented for 14 weeks: 12 weeks for the instruction (six lessons) and two weeks for midterm and final examinations.

Altogether, there were 36 hours of instruction (three hours per one session, and two sessions per class).

3.3.2.2 Step 2: Evaluating the Course

In the second step, the information was gathered to answer the first to fourth research questions: To what extent does the CLIL course improve English language abilities of undergraduate students?; To what extent does the CLIL course

improve agricultural content of undergraduate students?; To what extent does the CLIL course improve cultural knowledge of undergraduate students?; and What are the opinions of undergraduate students toward the CLIL course?

3.4. Instruments

To investigate the effectiveness of the course, three instruments were developed as follows:

1) A CLIL test

The pre- and post-CLIL tests were developed by the researcher to answer the first, second, and third research questions: To what extent does the CLIL course improve English language abilities of undergraduate students?; To what extent does the CLIL course improve agricultural content of undergraduate students?; and To what extent does the CLIL course improve cultural knowledge of undergraduate students? Hence, the test was an achievement test which was used to measure students' English language abilities, their agricultural content, and their cultural knowledge.

The CLIL test was divided into four parts including 1) the reading part, 2) the writing part, 3) the agricultural content part, and 4) the cultural knowledge part. The reading part consisted of the test items that measured students' reading

skills (such as identifying the main idea and specific details). The writing part consisted of two test tasks that measured students' ability to write an English language paragraph, which was in the cause and effect text type and the process text type, in the field of agriculture. The agricultural content part and the cultural knowledge part measured students' agricultural content and cultural knowledge that they had learned through the CLIL course. The reading part was in the form of multiple choices and short answers. The agricultural content part and the culture knowledge part were in the form of multiple choices, while the writing part was in the form of paragraph writing. Besides, each of the sub-parts of the CLIL test simultaneously measured thinking abilities (e.g., understanding and analyzing).

In terms of a test development process, the test design was based on the three main stages, namely, the design stage, the operationalization stage, and the administration stage (Bachman & Palmer, 1996). The development of each part of the test was as follows:

In terms of a test development process, the test design was based on the three main stages, namely, the design stage, the operationalization stage, and the administration stage (Bachman and Palmer, 1996). The development of the four parts of the test was as follows:

1.1) Outlining the test specifications

1.2) Developing the four parts of the test

- The reading part

1) Selecting the reading texts on the topics in the agricultural field for measuring sub-reading skills, namely, skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose

2) Designing the item type—the multiple-choice format and the short answer format were selected since they were parallel to the formats in the reading comprehension questions included in the supplementary materials used in the course.

3) Developing the reading part

Twenty-three test items were developed from the two reading texts on the topics in the agricultural field on the multiple-choice format and the short answer format. The reading texts did not exceed 250 words in length. For the multiple-choice format, each of the test items consisted of four choices (a, b, c, or

d), which accounted for 25% of a chance of correctness, while for the short answer format, each of the test items required the answer with no more than three words.

- The writing part

1) Selecting the writing topics in the agricultural field with the cause and effect text type and the process text type for measuring sub-writing skills, namely, expressing content, making an organization, selecting appropriate vocabulary, using language correctly and appropriately, and spelling, punctuation, and capitalization

2) Designing the task type—the paragraph construction tasks were selected since they were parallel to the writing tasks offered in class to practice their skills of writing in a limited discourse level at which learners were required to combine sentences into a paragraph.

3) Developing the writing part

Two test tasks together with the writing prompts were developed on the topics of in the agricultural field with the cause and effect text type and the process text type, with the two topics of ‘effects of low temperature on mango trees’ and ‘how to prevent chicken diseases.’

In terms of the writing rubric, analytical scoring was applied when marking the test task in the writing section in order to cover the language elements, the sub-writing skills, as mentioned earlier. Scoring was based on analytic scales in ESL created by Jacobs (1981, p. 30). In the scale, scripts were rated on five aspects of writing: content, organization, vocabulary, language use, and mechanics. The five aspects were differentially weighed to emphasize first content (30 points) and the next language use (25 points), with organization and vocabulary being weighed equally (20 points) and mechanics receiving the least emphasis (5 points). The rubric was included in Appendix E.

- The agricultural part

1) Designing the item type—the multiple-choice format was selected since it could be used to measure different objectives and adapted to various levels of learning outcomes (Burton, Sudweeks, Merrill, & Wood, 1991). It was used to measure the six major sub-topics of agricultural content which the students were expected to learn throughout the course. The six sub-topics were ‘environmental factors that affect plant growth,’ ‘irrigation methods,’ ‘site selection for poultry farms,’ ‘poultry housing,’ ‘marketing setting: e-marketing,’ and ‘the marketing mix.’

2) Developing the agricultural content part

Twenty-two test items were developed to measure the six sub-topics of agricultural content as mentioned earlier. The test items were in the multiple-choice format, and they consisted of four choices (a, b, c, or d), which accounted for 25% of a chance of correctness.

- The cultural knowledge part

1) Designing the item type—the multiple-choice format was selected since it could be used to measure different objectives and adapted to various levels of learning outcomes (Burton et al., 1991). It was used to measure the six sub-topic areas of culture related to the agricultural content, which the students were expected to learn throughout the course. The six sub-topic areas were ‘water management in Northeast Thailand,’ ‘irrigation in Thailand and Malaysia,’ ‘good agricultural practices for location and layout of chicken breeder farm: Thailand,’ ‘poultry housing in Thailand,’ ‘the state of e-commerce within the ASEAN region,’ and ‘the marketing mix: Thai rice export.’

2) Developing the cultural knowledge part

Twenty-one test items were developed to measure the six sub-topic areas of culture related to the agricultural content as previously

mentioned. The test items were in the multiple-choice format, and they consisted of four choices (a, b, c, or d), which accounted for 25% of a chance of correctness.

1.3) Validation the four parts of the test

Before test administration

At this stage, measuring the test constructs was undertaken. The purpose of this stage was to investigate whether the four parts of the test had content validity or not. In this stage, three experts in the field of language assessment and evaluation and ESP teaching were invited to review the test by marking a checklist with the choices of 'agreeable,' 'not sure,' and 'disagreeable.' After the test had been returned to the researcher, the index of item objective congruence (IOC index) was employed. Agreement of at least two of the experts were needed in order to consider the test to be valid (Booncherd Pinyoanathapong, 1983) and the validation score had to be at least 0.5 to ensure content validity of the test. In addition to calculating the agreement of the experts, the test was reviewed and revised according to the three experts' suggestions and comments. Besides, the agricultural content part and the cultural knowledge part were investigated by the experts in the field of the particular agricultural sub-topic. Then, the test items were reviewed and revised according to the comments of the experts.

After the test administration

After the reading part, the agricultural part, and the cultural knowledge part had been reviewed and adjusted according to the three experts' suggestions and comments, it was tried out with 21 Agricultural Technology students. The students were not the participants of the main study, and their language ability was quite similar to the participants because they were Agricultural Technology students who were taking the English for Academic Purposes (EAP) in the second summer semester of the 2013 Academic Year. Then, the construct validity of the reading part was investigated. That is, the test items were selected by considering the functionality of the test (reliability), the index of difficulty (difficulty index), and the gap between high and low scores (discrimination index). To yield the satisfactory of the internal consistency, the reliability should be over 0.70 (Supat Sukamolson, 2548). Apart from that, to consider whether each of the items was acceptable, the difficulty index should be between 0.20 and 0.80, and the discrimination index should be equal to 0.20 or higher (Supat Sukamolson, 2548). As for the reading part, the overall reliability, difficulty index, and the discrimination index were 0.848, 0.424, and 0.493, respectively. In terms of the agricultural content part, the overall reliability, difficulty index, and the discrimination index were 0.880, 0.491, and 0.487,

respectively. When it came to the cultural knowledge part, the overall reliability, difficulty index, and the discrimination index of the reading part of the test were 0.832, 0.439, and 0.497, respectively. Tables 3, 4, and 5 illustrate the domains of the reading part, the agricultural content part, and the cultural knowledge part of the test and the test number of each domain, respectively. The domains were based on a Revision of Bloom's Taxonomy of Educational Objectives proposed by Anderson et al. (2001, pp. 67-68).

Table 3: Domains of the Reading Part of the CLIL Test and Its Test Number

Category in the Cognitive Domain	Domains of CLIL Test	Total No. of Items	Item Numbers
Remember	Scanning the text for specific information	6	2, 7, 8, 14, 17, 20
	Making a reference	3	4, 10, 18
Understand	Skimming the text for main ideas	2	1, 13
	Analyzing vocabulary	4	5, 9, 15, 19
Analyze	Scanning the text for specific information (Identifying details of a piece of information)	2	3, 6
Create	Making an inference	4	11, 16, 21, 22
	Identifying the author's purpose	2	12, 23

Table 4: Domains of the Agricultural Content Part of the CLIL Test and Its Test Number

Category in the Cognitive Domain	Total No. of Items	Item Numbers
Remember	15	1, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 16, 17, 19, 20
Understand	5	2, 15, 18, 21, 22
Apply	2	6, 7

Table 5: Domains of the Cultural Knowledge Part of the CLIL Test and Its Test Number

Category in the Cognitive Domain	Total No. of Items	Item Numbers
Remember	17	1, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 16, 17, 18, 19, 20, 21
Understand	3	2, 7, 11
Evaluate	1	15

In terms of writing, after the writing part had been reviewed and revised according to the three experts' suggestions and comments, it was tried out with 15 Agricultural Technology students. The students were not the participants of the main study, and their language ability was quite similar to that of the study participants because they were Agricultural Technology students who had completed all the required Foundation English courses before taking the English for Academic Purposes (EAP) in the second summer semester of the 2013 Academic Year. Then, inter-rater

reliability and intra-rater reliability were examined. In terms of inter-rater reliability, the reliability of the two raters (the researcher and an ESP teacher who had experience in teaching Agricultural Technology students) was assessed by correlating the marks allocated to each test task by the two raters for the same test taker. When it came to the intra-rater reliability, the reliability of the researcher when marking the students' writing on two different periods of time (marking once on a particular period of time, and marking twice on the following week) was assessed by correlating the two marks allocated to each test task by the researcher for the same test taker. In this case, Pearson's Product Moment Correlation Coefficient (Prakong Kuuasut, 2535) was used to calculate the results of the raters' grading. According to Sirichai Kanchanawasri (2548), the acceptable value of the correlation should be between 0.5 and 1.0. As for the first writing task, 'Effects of low temperature on mango trees,' the inter-rater reliability and the intra-rater reliability were 0.966 and 0.996, respectively. In terms of the second writing task 'How to prevent chicken diseases,' the inter-rater reliability and the intra-rater reliability were 0.991 and 0.997, respectively. The domains were based on a Revision of Bloom's Taxonomy of Educational Objectives proposed by Anderson et al. (2001, pp. 67-68). Table 6 illustrates the domains of the writing part of the test.

Table 6: Domains of the Writing Part of the CLIL Test

Writing Test Task	Category in the Cognitive Domain	Domains of CLIL Test
Task 1	Understand	Studying and making understanding of the writing prompt
	Create	Writing a paragraph on 'Effects of low temperature on mango trees'
Task 2	Understand	Studying and making understanding of the writing prompt
	Create	Writing a paragraph on 'How to prevent chicken diseases'

2) An Opinion Questionnaire Toward a Content and Language

Integrated Learning (CLIL) Course to Enhance English Language Abilities, Agricultural Content, and Culture Knowledge of Undergraduate Students, and an interview protocol

An Opinion Questionnaire toward a Content and Language Integrated Learning (CLIL) Course to Enhance English Language Abilities, Agricultural Content, and Culture Knowledge of Undergraduate Students, as well as an interview protocol were developed by the researcher to answer the fourth research question: What are the opinions of undergraduate students toward the CLIL course?

2.1) An Opinion Questionnaire toward the Content and Language Integrated Learning (CLIL) Course to Enhance English Language Abilities, Agricultural Content, and Cultural Knowledge of Undergraduate Students

The questionnaire included the following three parts.

In Part A: EFL Demographic Information, and English Language Abilities (Reading and Writing Abilities), the participants were asked to report on the participants' demographic characteristics, namely, their gender, age, academic year of the study, and major field of study. This part also elicited the data on the participants' perception of their English language abilities (reading and writing abilities).

To report on their gender, age, and major field of study, the participants were asked to check in only one box or fill in the space provided. Besides, to report on their perception of the English language abilities, the participants were asked to check in only one box under the four categories of each skill. The five response-choices were 'very good,' 'good,' 'fair,' 'poor,' or 'very poor.'

In Part B: Opinions after attending the CLIL course, the participants were asked to express their opinions toward six main aspects of the CLIL course (course objectives and course content, teaching methods and activities,

instructional materials, evaluation, instructor, and overall impression) after attending it by choosing only one box under the five levels of their agreement with each statement. The five levels of the agreement were ‘strongly agree,’ ‘agree,’ ‘neutral,’ ‘disagree,’ and ‘strongly disagree.’ The evaluation criteria of the questionnaire were as follows:

4.51 – 5.00 meant the participants ‘strongly agreed’ with the item.

3.51 – 4.50 meant the participants ‘agreed’ with the item.

2.51 – 3.50 meant the participants ‘neither agreed’ nor ‘disagreed’ with the item.

1.51 – 2.50 meant the participants ‘disagreed’ with the item.

1.00 – 1.50 meant the participants ‘strongly disagreed’ with the item.

In Part C: Additional comments and suggestions on a Content and Language Integrated Learning (CLIL) Course to Enhance English Language Abilities, Agricultural Content, and Cultural Knowledge of Undergraduate Students, the

participants were given an opportunity to express their opinions and offer suggestions toward the course in the form of one open-ended question.

To avoid language barrier, the three parts of the questionnaires were written in Thai in hope that it would eliminate the participants' difficulty in responding to the items.

Validation

The content validity of the questionnaire was examined by three experts (two in the field of language assessment and evaluation, and one in the field of ESP teaching). They were invited to review the questionnaire by marking 'agreeable,' 'not sure,' and 'disagreeable' in a checklist. After the questionnaire had been returned by the three experts, the index of item objective congruence (IOC index) was calculated. To consider the questionnaire valid, agreement of at least two of the three experts was needed (Booncherd Pinyoanathapong, 1983 in Thaiบุญเชิด ภิญโญอนันต์พงศ์, 2526), and the validation score had to be at least 0.5 to ensure content validity of the questionnaire. After the agreement of the experts was considered, the questionnaire was reviewed and revised according to the experts' suggestions and comments. Then, the pilot study was conducted with 30 Agricultural Technology students who were taking the English for Academic Purposes (EAP)

course in the first semester of the 2014 Academic Year, and were not the participants of the main study. In terms of statistics, in order to determine the reliability of the questionnaire, the reliability was determined by using Cronbach's Alpha Coefficient, which was considered the formula appropriate for the rating scale data (Prakong Kunasut, 1992 in Thai ประคอง กรรณสูต, 2535), and the reliability of the questionnaire was 0.954.

2.2) An interview protocol

The interview protocol (the semi-structured interview) was designed by the researcher to collect in-depth information regarding the opinions of the participants toward the CLIL course. Generally, the interview questions were quite similar to the questions in Part B (Opinions after attending the CLIL course) of the questionnaire. As a consequence, the participants were asked to express their opinions toward six main aspects of the CLIL course (course objectives and course content, teaching methods and activities, instructional materials, evaluation, instructor, and overall impression in terms of the course's benefits and what to be improved) after attending it. However, the interview protocols were used to gain further information from what had previously been elicited with the closed-ended questionnaire.

The interview protocol consisted of 15 questions which probed the participants' opinions on the six major aspects of the CLIL course as previously mentioned. It included six items (items 1-6) regarding course objectives and course content; four items (items 7-10) concerning teaching methods and activities; three items (items 11-13) on instructional materials; one item (item 14) on evaluation, one item (item 15) on the instructor, and one item (item 16) regarding overall impression in terms of the course's benefits and what to be improved.

Validation

The content validity of the interview protocol was examined by three experts (two in the field of language assessment and evaluation, and one in the field of ESP teaching). The panel was the same as those who were invited to review the questionnaire. They were asked to mark the response choices of 'agreeable,' 'not sure,' or 'disagreeable' in the checklist to indicate their agreement, lack of agreement, or uncertainty with each of the items. After the interview protocol had been returned by the three experts, the index of item objective congruence (IOC index) was calculated. To consider the interview protocol valid, agreement of at least two of the experts was needed (Booncherd Pinyoanantapong, 1983 in Thai บุญเชิด ภิญโญอนันต์พงศ์, 2526), and the validation score had to be at least 0.5 to ensure

content validity of the interview protocol. Apart from calculating the agreement of the experts, the interview protocol was reviewed and revised according to the experts' suggestions and comments.

3.5 Data Collection Procedure

The data collection procedure involved the details as follows:

The CLIL course was implemented at the target university, King Mongkut's Institute of Technology Ladkrabang, during the first semester of the academic year 2014. The total number of the students who participated in the course was 27. They were the second-, third-, and fourth-year Agricultural Technology students who were enrolled in the elective English course entitled English for Academic Purposes (course code 90201003).

The CLIL course consisted of six units, and each unit focused on one sub-topic of agricultural content. The class met once a week, and each unit lasted two sessions (three hours per session). As a consequence, each unit took six hours, and there were altogether 36 hours in the course.

The first week was allocated to course introduction as well as the pre-CLIL test administration. The scores obtained from the pre-test were employed to investigate the students' English language abilities (reading and writing abilities), agricultural content, and cultural knowledge. The reading part lasted one hour, the

writing part lasted one hour, the agricultural content part took half an hour, and the cultural knowledge part ran for half an hour to complete. Thus, the test took three hours altogether. During the second to the seventh weeks, Units 2 and 3, and the first session of Unit 4 were taught. Then, the eighth week was allocated to the midterm examination. After the midterm examination, the second session of Unit 4, as well as Units 5 and 6 was completed during the ninth to the 14th weeks. In the 15th week, the post-CLIL test which lasted three hours altogether was administered. Finally, the 16th week was scheduled for the final examination.

Besides, the opinion questionnaire toward a CLIL course was distributed to the students in the 14th week. Also, the Interview protocol was employed with ten of the students at the end of the course, two weeks after the final examination, so as to facilitate the students to be able to spare time to share the information needed. The researcher was in charge of the interviews, and each interview was audio-recorded by using an electronic voice recorder. The data obtained from both the questionnaires and the interviews were analyzed to explore the opinions of the participants toward the CLIL course.

Chapter 4

Results

This chapter reports on the results of the study as listed in the following topics:

1. Needs of Agricultural Technology students and stakeholders for English language skills (reading and writing skills), thinking skills, agricultural content, and cultural knowledge, and opinions toward development of the CLIL course to enhance English language abilities, agricultural content, and cultural knowledge of undergraduate students
2. The extent to which the CLIL course improved English language abilities (reading and writing abilities) of undergraduate students
3. The extent to which the CLIL course improved agricultural content of undergraduate students
4. The extent to which the CLIL course improved cultural knowledge of undergraduate students
5. The opinions of undergraduate students toward the CLIL course

4.1 Needs of Agricultural Technology Students and Stakeholders for English Language Skills (Reading and Writing skills), Thinking skills, Agricultural Content, and Cultural Knowledge, and Opinions Toward Development of the CLIL Course to Enhance English Language abilities, Agricultural Content, and Cultural Knowledge of Undergraduate Students

Data on such needs were obtained from the three questionnaires and five interview protocols. The data gained with the questionnaires were obtained from the three groups of participants: 120 undergraduate students at the Faculty of Agricultural Technology, 18 ESP instructors, and 101 employees in agribusiness, while interview data were elicited from five groups of participants: ten undergraduate students at the Faculty of Agricultural Technology, three ESP instructors, three content instructors, ten employees in agribusiness, and three employers in agribusiness. The data on needs obtained from both the questionnaire and the interview protocol can be summarized on the seven main aspects, namely, English reading skills, English writing skills, common text patterns in expository writing in agricultural contexts, thinking skills, agricultural content, cultural knowledge, and opinions toward development of the CLIL course.

4.1.1 English Reading Skills

In terms of the degree to which Agricultural Technology students read in English in agricultural contexts, based on the data obtained from the interviews,

what student participants perceived was quite different from what ESP as well as content instructor participants perceived. That is, most student participants claimed that they read agricultural contexts in English to a large extent, while ESP as well as content instructor participants felt that Agricultural Technology students did not read in English in agricultural contexts as much as they claimed. Besides, what ESP as well as content instructor participants perceived in terms of the amount of reading did not correspond with what all employee and employer participants perceived about the degree to which employees in agribusiness read in agricultural contexts. To be specific, ESP as well as content instructor participants argued that Agricultural Technology students did not sufficiently read in English in agricultural contexts.

As for genres of reading in agricultural contexts, according to the interviews, Agricultural Technology students were assigned to read short excerpts from agricultural textbooks in agricultural subject matters. They also read agricultural academic texts as well as research articles for the seminar course and for their special project course. This corresponded with what employee and employer participants perceived about reading genres. Apart from agricultural academic articles and research articles, employee and employer participants pointed out that

employees in agribusiness were supposed to read business emails and documents about product specification in their line of work.

When it came to the importance of English reading skills in agricultural contexts, the data from both the questionnaire and the interviews illustrated that ‘skimming the text for main ideas’ was perceived as the most important English reading skill among all the three groups of the questionnaire participants as well as the five groups of interview participants.

4.1.2 English Writing Skills

As for the degree to which Agricultural Technology students write in English in agricultural contexts, the data gathered from the interviews indicated that Agricultural Technology students did not write much in agricultural contexts, as agreed by most student participants as well as all ESP and content instructor participants. Such a finding was not consistent with what employee as well as employer participants perceived about the degree to which employees in agribusiness wrote in agricultural contexts, which was quite high.

When it came to writing genres in Agricultural Technology students’ academic studies, as perceived by student as well as content instructor participants in the interviews, Agricultural Technology students had to write an abstract in English for their project report, which was in a paragraph level, when they took a special

project course. In addition, as claimed by ESP instructor participants, the students had to write summaries and notes in some elective language courses. This was not consistent with what employee and employer participants perceived about what employees in agribusiness wrote in English in agricultural context. That is, as the two groups of participants stated, employees in agribusiness were supposed to write a work report, some scripts for PowerPoint presentations, and emails to their supervisors and customers.

In terms of the importance of English writing skills in agricultural contexts, based on the data obtained from the questionnaires and the interviews, ‘expressing content’ and ‘making an organization’ were perceived as the most important English writing skills. That is, among the three groups of the questionnaire participants, ‘expressing content’ as well as ‘making an organization’ was ranked first, and among the four group of the interview participants, except the student participants, ‘expressing content’ was claimed to be the most important writing skill as well. Apart from that, based on the interviews, as perceived by ESP instructor participants, employee participants, and employer participants, ‘expressing content’ alongside ‘making an organization’ were the most important writing skills in agricultural contexts.

4.1.3 Common Text Patterns in Expository Writing in Agricultural Contexts

As for text patterns Agricultural Technology students used when they wrote in an English paragraph in agricultural contexts, regarding the data gathered from the interviews, the opinions of student participants and employer participants on text patterns Agricultural Technology students as well as employees in agribusiness used in agricultural contexts were quite divergent, whereas the opinions of ESP instructor participants, content instructor participants, and employee participants on this topic was quite definite. That is to say, the three groups of participants claimed that ‘causes and effects’ was the text pattern Agricultural Technology students as well as employees in agribusiness used the most in writing in English in agricultural contexts.

When it came to the importance of text patterns in agricultural contexts, the data obtained from the questionnaire do not concur with those obtained from the interviews. That is to say, ‘problem and solution’ was ranked first by student participants, while ‘process’ was ranked first by instructor participants and employee participants. However, ‘causes and effects,’ which came second in the questionnaire with the average score almost identical to that of the first rank, was

perceived in the interviewees as the most important text pattern among ESP instructor participants, content instructor participants, and employee participants.

4.1.4 Thinking Skills

In terms of the degree to which Agricultural Technology students had to use thinking skills or cognition in their academic studies, all five groups of interview participants perceived that, Agricultural Technology students used thinking skills in a very high degree in their academic studies, and that employees in agribusiness used thinking skills with a very high extent in their jobs.

When it came to Agricultural Technology students' use of thinking skills in their academic studies, based on the interviews, as perceived by student participants, ESP instructor participants, and content instructor participants, the two thinking skills 'remember' and 'understand' were more prominent in their opinions. As far as they were concerned, Agricultural Technology students used the 'remember' skill in memorizing technical terms in agricultural content and used the 'understand' skill in accessing the key message of a lesson. However, as perceived by employee as well as employer participants, the two skills 'understand' and 'analyze' were used most often in agricultural contexts. They pointed out that the 'understand' skill provided a good basis in capturing the meaning of a message, and

the ‘analyze’ skill helped them interpret the message more subtle and in more detail.

As for the importance of thinking skills in Agricultural Technology students’ academic studies, the data gained from both the questionnaires and the interviews suggested that ‘understand’ was perceived as the most important thinking skill. In addition to ‘understand,’ based on the questionnaires, ‘apply’ was claimed as the most important thinking skill in Agricultural Technology students’ academic studies. Besides, according to the interview data, ‘remember’ was perceived by student participants, ESP instructor participants, and content instructor participants as the most important thinking skill, while ‘analyze’ was pointed out by both employee and employer participants as the most important thinking skill in agricultural contexts.

4.1.5 Agricultural Content

1) Principles of crop production

As for principles of crop production, the data gathered from both the questionnaire and the interviews were quite inconsistent. That is, several sub-topics were mentioned as the most important. Nonetheless, ‘the influences of environmental factors on crop production’ was more prominent in the opinions portrayed through the questionnaires and the interviews. That is to say, based on the

data collected through the questionnaires, such a sub-topic was claimed by employee participants as the most important sub-topic, while based on the data gained from the interviews, the sub-topic was perceived by employer participants as the most important sub-topic in terms of principles of crop production.

2) Principles of animal production

When it came to principles of animal production, the data collected from the questionnaire did not correspond with those collected from the interviews. That is to say, based on the data obtained from the questionnaire, several sub-topics, such as ‘breeds and breed improvement,’ ‘hygiene and disease prevention,’ and ‘processing’ were mentioned as the most important sub-topics. Nevertheless, based on the data gained from the interviews, ‘farm management’ was cited by student participants, a content instructor participant, and employee participants as the most important sub-topic in terms of principles of animal production.

3) Principles of agricultural economics

As for principles of agricultural economics, it is clear that ‘marketing’ was perceived as the most important sub-topic among student participants and employee participants based on the data gathered from the

questionnaire, as well as the four groups of participants, except ESP instructor participants, who did not share this view in the interviews.

4.1.6 Cultural Knowledge

1) Importance of cultural knowledge in terms of the sub-topic areas

As for sub-topic areas of cultural knowledge (products, practices, and perspectives), according to the data gained from the questionnaires as well as from the interviews, cultural knowledge about ‘products,’ cultural knowledge about ‘practices,’ and cultural knowledge about ‘perspectives’ were all mentioned as the most important sub-topic areas for Agricultural Technology students and employees in agribusiness.

2) Importance of cultural knowledge in terms of knowledge about ourselves and others

As for the importance of cultural knowledge in terms of knowledge about ourselves and others (Thailand as a whole and specific parts of Thailand) and others (ASEAN and beyond ASEAN), regarding the data gained from the questionnaires and from the interviews revealed that cultural knowledge in agricultural contexts in ‘Thailand as a whole’ was claimed as the most important sub-topic of cultural knowledge. Nonetheless, based on the suggestions provided in

development of the CLIL course gathered from the questionnaires, the student participants argued that cultural knowledge in agricultural contexts in ‘ASEAN countries’ should be highlighted due to the vital role of the ASEAN Economic Community (AEC). During the interviews, cultural knowledge in agricultural contexts in ‘specific parts of Thailand’ was pointed out by ESP instructor participants as the most important sub-topic area.

4.1.7 Opinions Toward Development of the CLIL Course

1) Importance of the four components of CLIL (English language skills, agricultural content, thinking skills, and cultural knowledge)

Regarding the data obtained from both the questionnaire and the interviews (except among content instructor participants), it can be clearly seen that English language abilities (reading and writing abilities) were claimed as the foci of the CLIL course.

2) Proportion of the use of English and Thai in the CLIL course

In terms of the proportion of the use of English and Thai in the CLIL course, according to the data obtained from the questionnaires. The three groups of participants agreed that English should be used more than Thai when teaching the CLIL course. The data gathered from the interviews, on the one hand, most student participants and most employee participants agreed that English

should be used in the course more than Thai, with various kinds of proportion. In addition, as claimed by most ESP instructor participants, Thai should be used in the course more than English with the proportion with different proportions. In addition, from the views of content instructor participants and all employer participants, both English and Thai should be used in the course. Nonetheless, they did not specify how much the two languages should be used.

3) Implementation of activities and materials in the CLIL course

a) Instructional activities

As for the implementation of activities in the CLIL course, based on the questionnaire, 'group work' and 'self-study' were perceived as the most important instructional activities. However, during the interviews, all five groups of participants stated that instructional activities, namely individual work, pair work, and group work, should be implemented in the CLIL course in order to enable students to learn to take charge of their own learning as well as to learn from each other.

b) Instructional materials

When it came to the implementation of materials in the CLIL course, the data obtained from the questionnaire revealed that the use of

PowerPoint presentation was ranked first by student participants, whereas the use of video clips was ranked first by employee participants. According to the data gained from the interviews, among all five groups of the participants, visual aids, such as PowerPoint presentation and video clips, should be used in the CLIL course so as to help motivate students as well as to make a lesson more comprehensible for them.

4) Implementation of evaluation methods in the CLIL course

As for the implementation of evaluation methods in the CLIL course, the data obtained from the three groups of the participants were not absolutely consistent. That is, student participants agreed that exercises should be used as an evaluation method in the CLIL course more than tests. In contrast, employee participants pointed out that tests should be used as an evaluation method in the CLIL course in more than exercises. However, for instructor participants, both exercises and tests were ranked first as evaluation methods in the CLIL course. According to the data gathered from the interviews, all five groups of participants agreed that both tests and other evaluation methods such as assignments, quizzes, and exercises should be used in the CLIL course. That is to say, tests were supposed to be used as a means to reflect the progress of students, and

assignments, quizzes, and exercises should be used to help provide feedback to students all through the implementation of the course.

4.2 The Extent to Which the CLIL Course Improved English Language Abilities (Reading and Writing Abilities) of Undergraduate Students

The results in this part report on the extent to which the CLIL course improved English language abilities (reading and writing abilities) of undergraduate students by assessing the pre-test mean-scores of undergraduate students' language abilities of English reading and writing before attending the CLIL course, as well as the post-test mean-scores of undergraduate students' language abilities of English reading and writing after attending the CLIL course.

4.2.1 The Extent to Which the CLIL Course Improved English Reading Ability of Undergraduate Students

Table 7: Pre- and Post-test Results of English Reading Ability

	<i>n</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>t</i>	<i>df</i>	<i>Sig</i>
						<i>Differences</i>		<i>(2-tailed)</i>	
Pre-test	27	3	14	8.59	2.886	2.481	3.648	26	.001**
Post-test	27	5	18	11.07	3.174				

*** $p < 0.05$**

Table 7 indicates the students' progress in English reading ability, which was examined with the reading part of the CLIL test which was administered before and after the implementation of the CLIL course. As displayed in the table, the students' post-test mean scores of English reading ability were higher than their pre-test mean

scores at the statistical significance level of 0.05. Thus, this reflects the students' significant improvement ($t(26) = 3.648, p < 0.05$) on their English reading ability after attending the 12-week CLIL course.

4.2.2 The Extent to Which the CLIL Course Improved English Writing Ability of Undergraduate Students

Table 8: Pre- and Post-test Results of English Writing Ability (Task 1)

	<i>n</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>t</i>	<i>df</i>	<i>Sig</i>
						<i>Differences</i>		<i>(2-tailed)</i>	
Pre-test	27	34	43.5	35.130	4.6773	17.574	9.337	26	.001**
Post-test	27	38	73	52.704	9.9472				

*** $p < 0.05$**

Table 8 portrays the students' progress in English writing ability, which was examined with Task 1 of the writing part of the CLIL test which was administered before and after the implementation of the CLIL course. As shown in the table, the students' post-test mean scores in their English writing ability of Task 1 were higher than their pre-test mean scores at the statistical significance level of 0.05. Hence, this illustrates the students' significant improvement ($t(26) = 9.337, p < 0.05$) on their English writing ability in Task 1, 'Effects of low temperature on mango trees,' after attending the 12-week CLIL course.

Table 9: Pre- and Post-test Results of English Writing Ability (Task 2)

	<i>n</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>t</i>	<i>df</i>	<i>Sig</i>
						<i>Differences</i>		<i>(2-tailed)</i>	
Pre-test	27	0	43	21.963	16.5424	17.574	8.623	26	.001**
Post-test	27	37	73.5	54.870	10.0524				

*** $p < 0.05$**

Table 9 presents the students' progress in English writing ability, which was examined with Task 2 of the writing part of the CLIL test which was administered before and after the implementation of the CLIL course. As can be seen from the table, the students' post-test mean scores in their English writing ability of Task 2 were higher than their pre-test mean scores at the statistical significance level of 0.05, thus showing the students' significant improvement ($t(26) = 8.623, p < 0.05$) on their English writing ability in Task 2, 'How to prevent chicken diseases,' after attending the 12-week CLIL course.

Table 10: Descriptive Statistics of the Students' Writing Scores of the Pre-Test**Pre-test**

Writing Criteria	<i>n</i>	Range	Minimum	Maximum	Mean	SD
Content	27	18	0	18	9.37	6.270
Organization	27	12	0	12	5.11	3.512
Vocabulary	27	9	0	9	5.00	3.328
Language use	27	11	0	11	4.00	3.076
Mechanics of Writing	27	2	0	2	1.41	0.931

Table 11: Descriptive Statistics of the Students' Writing Scores of the Post-Test**Post-test**

Writing Criteria	n	Range	Minimum	Maximum	Mean	SD
Content	27	2	13	15	13.07	0.385
Organization	27	9	8	17	11.70	2.509
Vocabulary	27	1	7	8	7.07	0.267
Language use	27	13	7	20	12.15	4.521
Mechanics of writing	27	1	3	4	3.33	0.480

Table 10 and Table 11 display descriptive statistics of the students' progress in English writing ability in terms of content, organization, vocabulary, language use, and mechanics of writing. The students' ability was examined with Task 1 and Task 2 of the writing part of the CLIL test which was administered before and after the implementation of the CLIL course. As shown in the two tables, the students were able to write a paragraph in the post-test with more thorough and detailed content under better organization than in the pre-test. In addition, it can be seen that, in the post-test, the students could use more effective word choices as well as grammatical structures, while producing few errors in spelling, punctuation, capitalization, and paragraphing than they did in the pre-test. From these findings, it can be concluded that the students had greater improvement in writing in terms of content, organization, vocabulary, language use, and mechanics of writing after attending the CLIL course.

Apart from that, based on the mean differences of the pre- and post-tests, among the five aspects of writing, the students' writing ability in terms of 'language use' improved the most with the mean difference of 8.15, followed by 'organization' with the mean difference of 6.59.

4.3 The Extent to Which the CLIL Course Improved Agricultural Content of Undergraduate Students

The results in this part report on the extent to which the CLIL course improved agricultural content of undergraduate students by assessing the pre-test mean scores of undergraduate students' agricultural content before attending the CLIL course in comparison to the post-test mean scores of undergraduate students' agricultural content after attending the CLIL course.

Table 12: Pre- and Post-test Results of Agricultural Content Test

	<i>n</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>SD</i>	<i>Mean Differences</i>	<i>t</i>	<i>df</i>	<i>Sig (2-tailed)</i>
Pre-test	27	2	11	5.59	1.845	4.259	7.064	26	.000**
Post-test	27	6	13	9.85	2.088				

*** $p < 0.05$**

Table 12 shows the students' progress in agricultural content, which was examined with the agricultural content part of the CLIL test administered before and after the implementation of the CLIL course. As shown in the table, in spite of the low post-test mean scores of 9.85 points out of the total score of 22 points, the

students' post-test mean scores in their agricultural content were higher than their pre-test mean scores at the statistical significance level of 0.05. Therefore, the students' significant improvement ($t(26) = 7.064$, $p < 0.05$) on their agricultural content after attending the 12-week CLIL course.

4.4 The Extent to Which the CLIL Course Improved Cultural Knowledge of Undergraduate Students

The results in this part report on the extent to which the CLIL course improved cultural knowledge of undergraduate students by assessing the pre-test mean scores of undergraduate students' cultural knowledge before attending the CLIL course and the post-test mean scores of undergraduate students' cultural knowledge after attending the CLIL course.

Table 13: Pre- and Post-test Results of Cultural Knowledge Test

	<i>n</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>SD</i>	<i>Mean Differences</i>	<i>t</i>	<i>df</i>	<i>Sig (2-tailed)</i>
Pre-test	27	1	9	5.74	1.992	1.000	2.306	26	.029**
Post-test	27	3	10	6.74	1.973				

*** $p < 0.05$**

Table 13 depicts the students' progress in cultural knowledge, which was examined with the cultural knowledge part of the CLIL test which was administered before and after the implementation of the CLIL course. As displayed in the table, despite the post-test mean scores of 6.4 out of the total score of 21 points, the

students' post-test mean scores of cultural knowledge were higher than their pre-test mean scores at the significance level of 0.05. Consequently, this indicates the students' significant improvement ($t(26) = 2.306, p < 0.05$) on their cultural knowledge after attending the 12-week CLIL course.

4.5 The Opinions of Undergraduate Students Toward the CLIL Course

The results in this part report on the opinions of undergraduate students toward the CLIL course after the 12-week implementation. The results were obtained via both the opinion questionnaire on the CLIL course and the interview protocol.

4.5.1 The Opinions of Undergraduate Students Toward the CLIL Course Obtained from the Opinion Questionnaire

Part A: Demographic Information and English Language Abilities
(Reading and Writing Abilities) as perceived by undergraduate students at the Faculty
of Agricultural Technology

Table 14: Demographic Information and English Language Abilities
(Reading and Writing Abilities) as perceived by undergraduate students at the
Faculty of Agricultural Technology

Demographic Information and English Language Abilities (Reading and Writing Abilities)	Number	Percentage
Gender		
Male	2	7.40
Female	25	92.60
Age (years)		
19	2	7.40
20	15	55.60
21	7	25.90
22	3	11.10
Academic Year		
2nd	13	48.10
3rd	12	44.40
4th	2	7.40
Major		
Agronomy	7	25.90
Soil Science	4	14.80
Horticulture	7	25.90
Plant Pest Management Technology	4	14.80
Fisheries Science	1	3.70
Agricultural Communication	1	3.70
Landscape	3	11.10
Foundation English 1 Course Grade		
C+	6	22.20
C	7	25.90
D+	4	14.80
D	8	29.60
Missing	2	7.40
Foundation English 2 Course Grade		
B	2	7.40
C+	3	11.10
C	7	25.90
D+	9	33.30
D	3	11.10
Missing	3	11.10

Table 14: Demographic Information and English Language Abilities (Reading and Writing Abilities) as perceived by undergraduate students at the Faculty of Agricultural Technology (Cont.)

Demographic Information and English Language Abilities (Reading and Writing Abilities)	Number	Percentage
English Reading Ability in Agricultural Contexts		
2 (poor)	4	14.8
3 (fair)	21	77.8
4 (good)	1	3.70
5 (excellent)	1	3.70
English Writing Ability in Agricultural Contexts		
2 (poor)	11	40.70
3 (fair)	16	59.30
Total	27	100.00

The table 14 shows the demographic information of the participants of the main study, who were the second-, third- and, fourth-year undergraduate students at the Faculty of Agricultural Technology, studying in the first semester of the academic year 2014. Of the 27 participants, two were male (7.40%) and 25 were female (92.60%). More than half (55.60%) of them were 20 years old, while the rest were 19 (7.40%), 21 (25.90%), and 22 (11.10%) years old. They were majoring in Agronomy (25.90%), Soil Science (14.80%), Horticulture (25.90%), Plant Pest Management Technology (14.80%), Fisheries (3.70%), Agricultural Communication (3.70%), and Landscape (3.70%). In terms of Foundation English 1 and 2 course grades, the largest

group of the participants obtained the D (29.60) for Foundation English 1 and D+ (33.30) for the Foundation English 2. In addition, when it came to English Language Abilities (Reading and Writing Abilities) in their own perception, most of them claimed that they had English reading ability in agricultural contexts in the fair level (77.80%) and English writing ability in agricultural contexts in the fair level (59.30%).

Part B: Opinions after attending the CLIL course

Table 15: Students' Opinions after Attending the CLIL Course

Items	\bar{X}	S.D	Interpretation
Course objectives and course content			
1. The course objective on English <u>reading</u> ability is suitable.	4.04	0.649	agree
2. The course objective on English <u>writing</u> ability is suitable.	4.19	0.879	agree
3. The course objective on <u>thinking</u> ability is suitable.	4.11	0.641	agree
4. The course objective on <u>agricultural content</u> is suitable.	4.52	0.643	strongly agree
5. The course objective on <u>cultural knowledge</u> is suitable.	4.33	0.679	agree
6. The course content matches the objective on English <u>reading</u> ability	4.26	0.712	agree
7. The course content matches the objective on English <u>writing</u> ability	4.44	0.641	agree
8. The course content matches the objective on <u>thinking</u> ability.	4.41	0.636	agree
9. The course content matches the objective on <u>agricultural content</u> .	4.56	0.641	strongly agree
10. The course content matches the objective on <u>cultural knowledge</u> .	4.33	0.679	agree
11. The content of each unit is suitable for the time allocated (6 hours per unit, two sessions per unit, 12 sessions per course).	4.44	0.698	agree
12. The course content can improve my <u>reading</u> ability to work in agribusiness.	4.30	0.775	agree
13. The course content can improve my <u>writing</u> ability to work in agribusiness.	4.52	0.643	strongly agree

Table 15: Students' Opinions after Attending the CLIL Course (Cont.)

Items	\bar{X}	S.D	Interpretation
14. The <u>agricultural content</u> of the course can improve my ability to work in agribusiness.	4.30	0.724	agree
15. The <u>cultural knowledge</u> of the course can improve my ability to work in agribusiness.	4.19	0.736	agree
Instructional materials			
16. The teaching methods and activities of each unit in general can improve my <u>reading</u> ability.	4.30	0.542	agree
17. The teaching methods and activities of each unit in general can improve my <u>writing</u> ability.	4.44	0.751	agree
18. The teaching methods and activities of each unit in general can promote learning the <u>agricultural content</u> .	4.37	0.629	agree
19. The teaching methods and activities of each unit in general can promote learning the <u>cultural knowledge</u> .	4.19	0.681	agree
Teaching methods and activities			
20. There is a wide range of teaching methods and activities.	4.26	0.712	agree
21. I like working in pairs.	4.15	1.099	agree
22. I like working in groups.	3.81	1.210	agree
23. The instructional materials of each unit in general can promote practicing <u>reading</u> .	4.15	0.718	agree
24. The instructional materials of each unit in general can promote practicing <u>writing</u> .	4.33	0.620	agree
25. The instructional materials of each unit in general can promote learning the <u>agricultural content</u> .	4.37	0.688	agree
26. The instructional materials of each unit in general can promote learning the <u>cultural knowledge</u> .	4.19	0.681	agree
27. The instructional materials are interesting.	4.19	0.834	agree
Evaluation			
28. The evaluation methods are suitable.	4.44	0.698	agree
29. There is a clear explanation of the evaluation criteria before evaluating my writing.	4.56	0.577	strongly agree
Instructor			
30. The instructor are well-prepared in terms of the course content, the teaching methods, and the instructional materials.	4.85	0.362	strongly agree
31. The instructor has a good relationship with students.	4.74	0.447	strongly agree
Overall impression			
32. The course is beneficial for my further studies.	4.85	0.456	strongly agree
33. The course is beneficial for my future career.	4.74	0.526	strongly agree
Total	4.27	0.677	agree

Table 15 demonstrates the opinions of undergraduate students after attending the CLIL course in six aspects, namely, course objectives and course content, teaching methods and activities, instructional materials, evaluation, instructor, and overall impression.

1) Course objectives

As for course objectives, the participants strongly agreed that the course objective on agricultural content was suitable (Mean = 4.52; SD = 0.643), and they agreed that the course objectives on English reading ability (Mean = 4.04; SD = 0.649), English writing ability (Mean = 4.19; SD = 0.879), thinking ability (Mean = 4.11; SD = 0.641), and culture knowledge (Mean = 4.33; SD = 0.679) were suitable.

2) Course content

In terms of course content, the participants strongly agreed that the course content matched the objective on agricultural content (Mean = 4.56; SD = 0.641), and they also agreed that the course content matched the objective on English reading ability (Mean = 4.26; SD = 0.712), English writing ability (Mean = 4.44; SD = 0.641), thinking ability (Mean = 4.41; SD = 0.636), and cultural knowledge (Mean = 4.33; SD = 0.679). Apart from that, it was found that the participants agreed that the content of each unit was suitable for the time allocated (six hours per unit; two

sessions per unit; 12 sessions per course) (Mean = 4.44 and SD = 0.698). Also, it can be seen that the participants strongly agreed that the course content could improve their writing ability to subsequently work in agribusiness (Mean = 4.52; SD = 0.643). They, furthermore, agreed that the course content could improve their reading ability to work in agribusiness (Mean = 4.30; SD = 0.775), and that the agricultural content (Mean = 4.30; SD = 0.724) and the cultural knowledge (Mean = 4.19; SD = 0.736) of the course could improve their ability to work in agribusiness.

3) Teaching methods and activities

When it came to teaching methods and activities, the participants agreed that the teaching methods and activities of each unit in general could improve their reading ability (Mean = 4.30; SD = 0.542) as well as their writing ability (Mean = 4.44; SD = 0.741). The participants also agreed that the teaching methods and activities of each unit in general could promote learning agricultural content (Mean = 4.37; SD = 0.629) and cultural knowledge (Mean = 4.19; SD = 0.681). Apart from that, the participants agreed that there was a wide range of teaching methods and activities (Mean = 4.26; SD = 0.712), and that they liked working in pairs (Mean = 4.15; SD = 1.099) as well as in groups (Mean = 3.81; SD = 1.210).

4) Instructional materials

In terms of instructional materials, the participants agreed that the instructional materials of each unit in general could promote practicing reading (Mean = 4.15; SD = 0.718), practicing writing (Mean = 4.33; SD = 0.620), learning agricultural content (Mean = 4.37; SD = 0.688), and learning cultural knowledge (Mean = 4.19; SD = 0.681). Furthermore, the participants agreed that the instructional materials were interesting (Mean = 4.19; SD = 0.834).

5) Evaluation

As for evaluation, the participants strongly agreed that there was a clear explanation of the evaluation criteria before evaluating their writing (Mean = 4.56; SD = 0.577), and they also agreed that the evaluation methods were suitable (Mean = 4.44; SD = 0.698).

6) Instructor

When it came to the instructor, it was found that the participants strongly agreed that the instructor was well-prepared in terms of course content, teaching methods, and instructional materials (Mean = 4.85; SD = 0.362) and that the instructor had a good relationship with her students (Mean = 4.74; SD = 0.447).

7) Overall impression

With regard to overall impression, the participants agreed that the course was beneficial for their further studies (Mean = 4.85; SD = 0.456) and for their future career (Mean = 4.74; SD = 0.526).

Additional comments and suggestions on the Content and Language

Integrated Learning (CLIL) Course to Enhance English Language Abilities,

Agricultural Content, and Cultural Knowledge of Undergraduate Students

Among 27 participants, there were nine participants who provided additional comments and useful suggestions for development of the CLIL course. As for additional comments on the CLIL course in terms of agricultural content, four participants claimed that the agricultural content of the course was appropriate and useful for their further studies as well as future career. Furthermore, the agricultural content was extensive since it covered the three main areas of agricultural field of study, namely, principles of crop production, principles of animal production, and principles of agricultural economics. Nevertheless, two participants claimed that some sub-topic areas of the agricultural content were a bit difficult. To revise the course in terms of agricultural content, three participants made their suggestions. That is, one suggested 'plant parts' as the sub-topic area of the agricultural content

in the first lesson. Besides, another participant suggested adding 'soil nutrition' as one of the sub-topic area of the agricultural content, and the other participant suggested adding 'marine animals' as one of the sub-topic areas of the agricultural content.

As for additional comments and suggestions for development of the CLIL course in terms of teaching writing, one participant claimed that the topics of the writing assignments were suitable because they corresponded with the agricultural content and their field of study. Moreover, he/she claimed that the writing session in the lesson provided her/him a good basis for development of their writing ability in the long run. So as to revise the course, particularly the writing session, one suggested providing more time allocated for teaching the steps of the process in writing (outlining, writing, and editing). This was because each step was detailed, so elaboration and practice of each of the three steps would be helpful.

4.5.2 The Opinions of Undergraduate Students Toward the CLIL Course Obtained from the Interview Protocol

The interview was conducted in order to obtain the in-depth information on the opinions of the participants toward the CLIL course. The participants were ten volunteering Agricultural Technology students who attended the CLIL course. The findings involved the opinions of the participants in the seven major aspects: 1)

course objectives, 2) course content, 3) teaching methods and activities, 4) Instructional materials, 5) evaluation, 6) instructor, and 7) benefits of the course and what to be improved.

1) The opinions toward course objectives

1.1 Ability to recall course objectives

The findings from the interview revealed that the participants could recall the five course objectives on English reading ability, English writing ability, thinking ability, agricultural content, and cultural knowledge.

1.2 Suitability of course objectives

In terms of suitability of course objectives, nine participants agreed that the five course objectives were suitable because they offered a good opportunity for students to develop various skills as well as gain many areas of knowledge. That is to say, via such course objectives, students had a good chance to improve the skills such as English language skills and thinking skills, as well as to broaden their knowledge, including agricultural content and cultural knowledge, necessary for their further studies and future career, as evident in the following excerpts:

I think the course objectives are appropriate. I always gain agricultural knowledge in a content course in Thai. This is a good chance for me to obtain agricultural knowledge in English. Also, with such objectives, the course promotes development of my English language skills in both reading and writing. (Student 1)

The course objectives are suitable. This is because I am in the field of agriculture, the course objectives could help me develop my English language abilities, agricultural content, and cultural knowledge. (Student 2)

With such course objectives, I could have a chance to practice various skills. That is, this will be a good chance to practice my skills in thinking and in writing, simultaneously. (Student 3)

1.3 Preference on course objectives

Among five course objectives, five participants agreed that the course objective on English writing ability was the one they liked the most. They claimed

that this was because they were not skillful in writing and they rarely had a chance to write, as illustrated in the following excerpts:

The course objective on English writing ability is the one I like the most. Since I almost have no experience in writing at a paragraph level, this is my good opportunity to learn how to write an English paragraph. (Student 2)

I do not have much experience in writing, even in the sentence level, so I am shy to write and I am afraid that I would produce a bad piece of writing. That is why I like the course objective on English writing ability the most. (Student 3)

I like the course objective on English writing ability the most because this is my first time that I have an opportunity to write in a paragraph level. As far as I am concerned, writing a paragraph in English is a challenge. This will be beneficial for me when I work in agribusiness, particularly when I have to work with customers from ASEAN member countries. (Student 4)

Besides, the other two participants stated that the course objective on thinking skills was the one they liked the most as they explained:

I like the course objective on thinking skills the most due to the fact that thinking is a good basis of learning both agricultural content and of studying academic as well as research articles in the field of agriculture. Through such a course objective, I have a chance to practice thinking skills such as the ‘understanding’ skill and the ‘analysis’ skill. (Student 5)

The course objective on thinking skills is the one I like the most. This is because such skills are a good premise in learning the content of any course, both agricultural and non-agricultural content courses.

(Student 6)

In addition, there was one participant who claimed that the course objective on English reading ability was the one she liked the most since such an objective helped her practice her reading strategies which enabled her to gain deep

and thorough understanding of a reading text. Besides, the other participant indicated that the course objective on cultural knowledge was the one she liked the most.

This was because, in her view, it was important to learn about what Thailand as well as other countries had gone through in terms of agriculture-related culture.

Furthermore, another participant pointed out that the course objective on agricultural content was the one she liked the most because, as far as she was concerned, the agricultural content learned through the CLIL course could be applied in her future career when she had to work in agribusiness.

Apart from that, eight participants claimed that there was none of the five course objectives that they did not like. However, one participant stated that she liked the course objective on English reading ability the least due to her bad experience with learning reading, as illustrated below:

I like the course objective on English reading ability the least because of my personal reason. That is to say, I don't like reading, and I have had terrible experience in learning reading. That is why I do not enjoy reading in English. (Student 3)

Moreover, another participant claimed that she liked the course objective on cultural knowledge the least because of her own personality, as reflected in the following excerpt:

The course objective on cultural knowledge is the one I like the least.

This involves my own personality. That is, I do not enjoy learning about what is happening around me. (Student 10)

2) The opinions toward the course content

2.1 Congruence between course content and course objectives

The findings from the interview showed that all ten participants agreed that the course content matched the course objectives, as depicted in the experts below:

In my view, the course content matches the course objectives. To be specific, the stated course objectives are those on English language abilities (reading and writing abilities), agricultural content, cultural knowledge, and thinking skills. Thus, I have a chance to practice reading and writing skills, to gain agricultural content as well as cultural knowledge, and to improve my thinking skills. (Student 3)

The course content matches the course objectives. That is, the stated course objectives are related to what we have learned in class.

(Student 4)

I think the course content match the course objectives. For example, one of the course objectives is on English reading ability, and I have been trained to develop my reading skills. Moreover, the other course objective is the one on agricultural content, and I have had an opportunity to learn agricultural content. (Student 6)

However, as regards revising the course content, one participant suggested that the course developer add 'plant nutrients' as one of the sub-topics of the agricultural content:

If the course content is revised, I would like 'plant nutrients' to be added as one of the sub-topics of the agricultural content since it is directly related to my major field of study. (Student 3)

2.2 Suitability of course content in terms of time allocated

As for suitability of course content in terms of time allocated, all ten participants agreed that the course content was suitable for the time allocated (six hours per lesson, two sessions per unit, 12 sessions per course). They felt that two sessions allocated for one lesson with six lessons per course was suitable, stating:

I like the way two sessions are allocated for each lesson; it is not too much or too little. (Student 1)

I think the course content is suitable for the time allocated. I like the way each of the six lessons takes two sessions, and the way one of the sessions lasts three hours. The course content really fits the time allocated. (Student 2)

I think the course content in terms of time allocated is appropriate.

The amount of content delivered per session is not too much or too little. Consequently, each class is not boring, and it could provide me sufficient knowledge. (Student 4)

Nevertheless, two participants claimed that time allocated for practicing writing should be improved. One participant felt that the writing session should be longer, and the other suggested that practicing writing each of the two text types should be done in two lessons (instead of three lessons), so four pieces of writing should be assigned (instead of six pieces of writing) all over the course.

2.3 Effects of course content on students' ability to work in agribusiness

Regarding effects of course content on students' ability to work in agribusiness, all ten participants agreed that the course content could enhance their ability to work in agribusiness in terms of their agricultural content, technical terms in the field of agriculture, and cultural knowledge:

The content of this course can help me gain more agricultural content and cultural knowledge, which are quite important for employees in agribusiness in the era of the ASEAN Community.

(Student 1)

The course content helps me gain thorough agricultural content as well as cultural knowledge, which is as a good basis for working in agribusiness in the near future. (Student 4)

Since I am majoring in landscape, the agricultural content on the irrigation method lesson helps me realize which irrigation method should be applied in a particular area. This will really benefit my future career in agribusiness. (Student 6)

In my view, the agricultural content on the e-commerce lesson helps provide me a good basis of doing agribusiness in an IT era. (Student 7)

Furthermore, the participants claimed that the course content could help them improve their English reading and writing skills which were vital for employees in agribusiness. They described:

I think the course content helps me develop my English reading and writing skills, which are very important for my future career. After I learned through the course, I found that I spend less time trying to understand a reading text, and I can also produce a piece of writing in a paragraph level. (Student 1)

In my opinion, the course content on English writing ability makes me know how to write an English paragraph, which will enable me to efficiently contact foreign customers. (Student 2)

The course content allows me to effectively read an academic or research article in the agricultural field as well as to write a document required for job application. (Student 6)

In my opinion, the course content on English reading and writing abilities constitutes a good basis of doing agribusiness in an international market. (Student 8)

3) The opinions toward the teaching methods and activities

3.1 Effects of teaching methods and activities on students' English

reading and writing abilities

The findings showed that all ten participants believed the teaching methods and activities of the CLIL course could help improve their reading and writing abilities.

In terms of reading, one participant cited that she could develop her reading ability through learning agricultural content. She clarified that learning several topic areas of agricultural content helped her learn about new agricultural technical terms in English. This led to her larger technical term list, which, in turn, fostered her better reading ability:

In this course, agricultural content is one of the main foci. While learning the agricultural content, I was supposed to learn the technical terms simultaneously. Since vocabulary knowledge plays a significant role in understanding a particular reading text, I can read more efficiently. (Student 2)

In addition, another participant revealed that she could read better because she was trained to guess the meaning of an unknown word in a reading text from the context, describing:

I think, all over the course, I have been better in terms of reading. The teaching of the reading sub-skill, analyzing vocabulary, enables me to know what I should do when encountering an unknown word in a reading passage. (Student 6)

Furthermore, another participant claimed that she could improve her reading ability from learning how to write several types of a paragraph. She elaborated that learning about components of a paragraph and many kinds of linking words helped her read more efficiently, as she explained:

I think I developed my reading skills through learning how to write an English paragraph in this course. That is, learning how to write a topic sentence facilitates how to find the main idea of a reading text. Also, practicing to use several types of linking words helps me better understand several types of a reading text. (Student 7)

As for writing, nine out of ten participants agreed that the process-based writing approach which was applied in this course could make them clearly see the steps of writing. The writing procedure which included outlining, writing, and editing, enabled them to eventually write a piece of writing as displayed in the following excerpts:

In this course, I learned about the writing procedure. As far as I am concerned, these steps, especially outlining and making drafts, make me know how to write, and this helps improve my writing skills.

(Student 1)

I like the way the process-based writing approach was integrated into the course. The approach makes me know how to write a paragraph step-by-step. Among several steps of writing, I like the peer editing step the most since it helps me a lot when revising my writing assignment. (Student 2)

The process-based writing approach is very useful. That is, the peer editing step helps me identify errors in my writing. It makes me able to produce a better final draft. (Student 6)

The peer editing step included in the process-based writing approach is beneficial for me. This can help me improve my writing in terms of both content and mechanics of writing. (Student 10)

Besides, one participant explained that the way the language use was embedded in writing sessions of the course provided her a chance to learn about grammatical aspects needed for writing each text pattern:

Because the language used was included in the teaching of writing, I had an opportunity to practice using the structure and expressions needed for writing a particular text pattern. (Student 9)

3.2 Effects of teaching methods and activities on students' agricultural content and cultural knowledge

When it came to the effectiveness of the teaching methods and activities on learning agricultural content and cultural knowledge, all ten participants agreed that the teaching methods and activities of the CLIL course could promote learning agricultural content and cultural knowledge. This could be seen in the excerpts below:

Instructional activities, particularly games, make the lesson fun, so the class is not boring. (Student 1)

I like the way video clips were embedded in the teaching of the CLIL course. This attracts my attention and helps me better understand agricultural content. Besides, the activity that I had to do after watching each video clip allows me to have a chance to exchange my ideas with many classmates. This helps me better memorize the course content. (Student 4)

The use of games in the course makes me better memorize the course content, especially in terms of cultural knowledge.

(Student 8)

I think the use of games helps foster a good learning atmosphere. It makes me feel relaxed, and this could lead to my better understanding of agricultural content and cultural knowledge.

(Student 9)

3.3 A variety of teaching methods and activities

All ten participants claimed that there was a wide range of teaching methods and activities of the CLIL course. That is to say, the teaching methods and activities ranged from individual work, to pair work and group work:

The teaching methods and activities vary. There are individual work, pair work, and group work, and this makes the class not boring.

(Student 1)

In my view, there is a variety of teaching methods and activities. I have an opportunity to work individually, in pairs, and in groups.

(Student 8)

However, some participants suggested that more games should be added to sustain a good class atmosphere and the number of group-work activities should be increased to give them more chances to share ideas with their group members. Furthermore, they suggested that a group should consist of only three members instead of four or five to better promote collaboration within a group.

Furthermore, the finding indicated that nine out of ten agreed that working in pairs and in groups could promote learning in the CLIL course. This is because it gave students an opportunity to share ideas and learn from each other:

I like working in pairs and in groups. Working with my friends helps us come up with an idea of each other and support each other.

(Student 1)

Working in pairs and in groups helps me read more efficiently. When I come across an unknown word, I can ask for help from my partner or my teammates. (Student 6)

Working in pairs and in groups fosters my learning. Whenever I encounter difficulty in doing a task or an activity, I can consult with my friends. (Student 8)

For me, working in pairs and in groups makes me become less stressed. This is because I have my partner or my teammates to help share ideas. (Student 9)

When it came to the obstacles in working in pairs and in groups, one participant pointed out that working in groups sometimes could be a problem when the group members preferred to talk with his/her close friend than to talk to the entire group. So as to solve this problem, she decided to be the one who initiated the conversation of the whole group. In addition, three participant agreed that time constraint was an obstacle in working in groups:

Sometimes, it's quite difficult for four or five people to spare time to work together. In order to solve this problem, we have to talk about a particular assignment via mobile phone. (Student 5)

4) The opinions toward instructional materials

4.1 Effects of instructional materials on students' English reading and writing abilities

The findings revealed that all ten participants agreed that the instructional materials of each unit in general could promote practicing reading and writing. They pointed out that the instructional worksheets were precise, the video clips were interesting, and the PowerPoint slides were effective. To be specific, the slides could capture students' attention and were clear:

Generally, the instructional materials of each unit help me practice my reading and writing. I really like the slides that provide feedback on writing assignments. With such slides, I can learn to improve how to write by learning from my friends' mistakes as well as from my own mistakes. (Student 2)

The instructional materials of each unit can help foster reading and writing. Both the PowerPoint slides and instructional worksheets include useful writing expressions as well as the examples that help portray how to use such expressions in several contexts. (Student 6)

In general, the instructional materials of each unit, both the PowerPoint slides and instructional worksheets, are clear and easy to follow in terms of their layout and content. Therefore, they help promote my understanding of how to read and write in each lesson.

(Student 10)

4.2 Effects of instructional materials on students' agricultural content and cultural knowledge

According to the findings, all ten participants claimed that the instructional materials of each unit in general could promote learning agricultural content and cultural knowledge. That is, the instructional materials of each unit were applied appropriately, to a certain extent:

The use of the instructional materials of each unit in general is suitable. It is not too much or too little, so the students are not spoon-fed, and this could lead to the understanding of agricultural content and cultural knowledge. (Student 1)

The pictures shown on the PowerPoint slides and instructional worksheets of each unit attract my attention and make agricultural content and cultural knowledge that the instructor wants to deliver more precise. (Student 8)

The pictures as well as video clips integrated in the PowerPoint slides capture my attention. They also make me understand agricultural content and cultural knowledge of each unit more easily. (Student 9)

Nonetheless, to help make the instructional materials more effective, some participants suggested that more pictures should be added onto some PowerPoint slides, and some video clips which were too long should be revised.

4.3 Effectiveness of instructional materials in general

Regarding the instructional materials in general, all ten participants agreed that the instructional materials were interesting because they suited the level of the students' English proficiency, and their content was well-organized, as can be seen in the following excerpts:

In general, the instructional materials are interesting. They are neither too difficult nor too easy. Besides, the content of each shown on the slides is well-organized. (Student 1)

The instructional materials in general are not too difficult. That is why they suit the students' level of proficiency. Besides, the way that they are well-arranged helps promote the students' better understanding of the course content. (Student 6)

Generally, I think the instructional materials are appropriate. I like the way pictures are included to help make the course content clear. Moreover, the layout, the font type, and the font size of both the PowerPoint slides and instructional worksheets make the content easy to follow. (Student 8)

In order to help improve the instructional materials, three participants suggested adding a few more pictures onto some PowerPoint slides, while the other

two participants thought that a few more video clips should be added into some lessons.

5) The opinions toward the evaluation

In terms of evaluation methods, all ten participants agreed that the evaluation methods were suitable. This was because there were both formative and summative assessments:

I think the evaluation methods used in this course are suitable. There are several assignments to do all through the course. This helps show the students' progress and provide feedback so that they can improve their performance. (Student 2)

The evaluation methods used in this course are appropriate. In terms of reading, there are both midterm as well as final examinations. As for writing, apart from midterm and final examinations that help reflect the students' progress, there are six writing assignments that enable the instructor to provide feedback to the students all over the course. (Student 4)

In terms of writing, I like the way writing assignments are used as one of the evaluation methods together with tests. If only tests were used as an evaluation method, the students could not see their performance during the course. If that was the case, they could not realize their strengths and weaknesses, and they were not able to improve their skills. (Student 9)

6) The opinions toward the instructor

With regard to the opinions toward the instructor of the CLIL course, all ten participants agreed that the instructor was energetic and had a good relationship with the students. This made the students feel free to ask for their advice, and this good relationship also made the class interesting:

All through the semester, I found that the instructor is really active. She can also establish a good relationship with the students. This makes us feel at ease and not worried to ask her any question when we have a problem with the lesson. (Student 1)

The instructor can build up a good relationship with the students, so this makes the class interesting and not boring. (Student 2)

I think the instructor is determined, and I like her teaching methods which can make the content clear and easy to understand.

(Student 6)

In my view, the instructor is dedicated and cares about the students' progress in learning. This makes me not afraid to ask her a question when I do not understand any part of the course content. (Student 7)

7) The opinions toward the benefits of the course and what to be improved

When it came to the opinions toward the benefits of the course, all ten participants claimed that the CLIL course could make them achieve many aspects of learning outcomes. That is, they obtained both agricultural content and cultural knowledge, and they improved reading and writing skills as well as thinking skills as shown in the following excerpts:

Because of this course, I have developed various skills. That is, I have a chance to improve my writing skills, to learn more technical terms in the agricultural field, and to obtain cultural knowledge on several topics. (Student 2)

The CLIL course provides me a chance to develop my writing skills in a paragraph level as well as to improve my reading skills. Besides, it offered me an opportunity to practice my thinking skills as well as to gain agricultural content and cultural knowledge. (Student 3)

Attending the course makes me gain more agricultural content which is a good basis for my further career in agribusiness. Moreover, it makes me acquire reading skills which are important when I have to read academic papers in my field of study. (Student 6)

The course helps me develop my writing ability and obtain agricultural content and cultural knowledge. I think I can apply such

skills and content when I have to work in agribusiness in the future.

(Student 8)

It's a good opportunity to develop various skills, especially the skills

in writing. Moreover, I gained agricultural content and cultural

knowledge. In my opinion, these skills and knowledge can be

subsequently applied when I have to work in agribusiness. (Student 9)

To help improve the course, one participant suggested allocating more time for provision of the writing feedback to students, as evidenced below:

In spite of the allocated time for giving writing feedback to students, I

think a few more time should be added onto the writing feedback

session to make it clearer to the students about what they should

improve in each of the assignments. (Student 2)

4.6 Summary of the Results

4.6.1 English language abilities: The pre- and post-test scores of the English Reading Ability Test as well as of the English Writing Ability Tasks indicated that the students improved their English language abilities in both reading and writing after the CLIL course implementation.

4.6.2 Agricultural content: The pre- and post-test scores of the Agricultural Content Test showed that the students improved their agricultural content after the CLIL course implementation.

4.6.3 Agricultural content: The pre- and post-test scores of the Cultural Knowledge Test revealed that the students improved their cultural knowledge after the CLIL course implementation.

4.6.4 The CLIL course evaluation: Students' opinions toward the CLIL course were positive because they pointed out that the CLIL course was beneficial for their further studies as well as future career. That is, the course helped them obtain both agricultural content and cultural knowledge and improve reading skills and writing skills. Besides, the course helped promote students' thinking skills which were simultaneously enhanced at the same time as English language abilities, agricultural content, and cultural knowledge were developed throughout the course

Chapter 5

Summary of the Results, Discussion, Implications, and Recommendations for Future research

5.1 Summary of the Study

The study aimed to investigate the extent to which the CLIL course improves English language abilities, agricultural content, and cultural knowledge of undergraduate students, as well as their opinions toward the CLIL course. Since CLIL is an educational method which has several foci, the CLIL course implemented in the present study chose to place its emphasis on developing both reading and writing abilities of the Agricultural Technology students, hence the communication component, as well as on promoting their learning about agricultural content and cultural knowledge related to the agricultural content which was the students' major field of study, with the belief that in so doing, the students' cognition would be developed along the way.

In order to investigate the extent to which the CLIL course improved the students' English language abilities, agricultural content, and cultural knowledge, the 12-week experiment was conducted at a public university in Thailand during the first semester of the academic year 2014. The participants ($n = 27$) represented an intact

group of Agricultural Technology students who were enrolled in the English for Academic Purposes course offered to the second-year, third-year, and fourth-year Agricultural Technology students.

There were two phases in the study: 1) the development of the CLIL course based on a needs analysis and its validation and 2) the course implementation and evaluation of the effects of the CLIL course. In Phase 1, the research instruments included (1) a needs analysis questionnaire (used to collect data from the three groups of participants, namely, Agricultural Technology students, ESP instructors, and employees in agribusiness) and (2) a semi-structured interview protocol (used to collect in-depth information on the needs of Agricultural Technology students from the five groups of participants, namely, Agricultural Technology students, ESP instructors, content instructors, employees in agribusiness, and employers in agribusiness). The two research instruments were used to obtain the needs of Agricultural Technology students and stakeholders for English language skills (reading and writing skills), thinking skills or cognition, agricultural content, and cultural knowledge, as well as opinions toward development of the CLIL course to enhance English language abilities, agricultural content, and cultural knowledge of undergraduate students. In Phase 2, the research instruments included (1) the CLIL

pre- and post-tests (used to measure students' English language abilities (reading and writing abilities), agricultural content, and cultural knowledge), (2) a questionnaire to elicit the participants' opinions toward the CLIL course, and (3) an interview protocol.

So as to investigate the effects of the CLIL course on Thai undergraduate students, this study attempted to answer the four research questions as follows:

1. To what extent does the CLIL course improve English language abilities of undergraduate students?
2. To what extent does the CLIL course improve agricultural content of undergraduate students?
3. To what extent does the CLIL course improve cultural knowledge of undergraduate students?
4. What are the opinions of undergraduate students toward the CLIL course?

The findings from the main study can be summarized in accordance with the research questions mentioned earlier as follows:

- 1) The students' mean scores of English language abilities, both reading and writing abilities, were significantly higher after attending the 12-week CLIL course.

2) The students mean scores of agricultural content were significantly higher after attending the 12-week CLIL course.

3) The students mean scores of cultural knowledge were significantly higher after attending the 12-week CLIL course.

4) The students had positive opinions toward the CLIL course.

Apart from the overall opinions of the participants toward the course, several important points can be drawn from both the questionnaire and interview data.

4.1) The findings from the opinion questionnaire clearly showed that the participants strongly agreed that the course objective on agricultural content was suitable and that the course contents matched the objective of the agricultural content.

4.2) Based on the findings from the interviews, the participants had positive opinions toward the course objective and the course content on English writing ability.

4.3) According to data obtained from the interviews, the participants had positive opinions toward the teaching methods and activities as well as instructional materials implemented in the CLIL course.

5.2 Discussion

5.1.1 The Extent to Which the CLIL Course Improved English Language Abilities, Agricultural Content, and Cultural Knowledge of Undergraduate Students

1) The extent to which the CLIL course improved English language abilities (reading and writing abilities) of undergraduate students

According to the findings of the study, it can be said that the students showed improvement at a significant level in their English language abilities, both reading and writing abilities, after attending the 12-week CLIL course. This yielded support to the effectiveness of the implementation of the CLIL course as its name suggests that one of the main foci of this educational approach is ‘the target language’ as Coyle et al. (2010), Bently (2010), and Dalton-Puffer (2007) have claimed. That is why ‘the target language’ is one of the major components of CLIL as can be seen from the view of Coyle et al. (2010) and as portrayed through the Internet site called *The CLIL Compendium* (The CLIL Compendium, 2001).

In order to explore the success of CLIL in this study in terms of language development, it is necessary to probe the underlying principles of the approach in the first place. According to Wolff (2010), CLIL draws on the assumption that the target language can be best learned when the subject matters are conveyed through the language (Wolff, 2010). That is to say, classroom content must be drawn

from content subjects or academic and specific disciplines rather than from everyday life or general content of the target language. This is because learning the target language through such academic content helps students see the association between language learning and how to put the language into actual practice in their career after graduation (Gil, 2012). In the CLIL course developed in the present study, the students were supposed to read and write agricultural content, which was their specific field of study, in English. Because the students' awareness that the target language they learned in the course content could be applied when they had to work in agribusiness was raised, they could see how reading and writing the agricultural content in English would enable them to use the language in an authentic situation in their prospective career. This might have helped the students become highly encouraged and motivated to acquire the target language to successfully achieve desired language outcomes.

Apart from the connection between language learning and how to put the language into practice in their prospective career, the success of CLIL may involve the role of thinking skills or cognitive ability, which, in this study, were developed simultaneously during the time that reading and writing abilities were promoted throughout the course. As included in the 4Cs Framework proposed by

Coyle et al. (2010), cognition is one of the four major components due to the fact that it helps drive the instructional process and encourage students to gain achievement in the target language (European Commission, 2012). To be specific, unlike the traditional EAP course offered at KMUTL in which the theme-based approach is being currently used, the developed CLIL course in the present study highlighted the tasks that helped promote the students' reading and writing abilities and foster thinking ability simultaneously. To illustrate, in Unit 1, when the students were assigned to practice their reading skills through a text concerning 'Light,' they were asked to complete a task that helped practice their analytical thinking skills. That is, the students had to study the text and complete the diagram to show that they could identify the three principal characteristics of light that affected plant growth, namely, quantity, quality, and duration, as well as the key features related to each of the characteristics. As for writing, in Unit 1, when the students were assigned to write an English paragraph on 'Effects of heavy rains on a watermelon plant,' they had to study the prompt and analyze the information given to identify the causes and effects of the situation. Besides, to enable them to express their ideas to produce their writing in the form of a paragraph, the students needed to compile the arranged ideas and eliminate irrelevant details. Since the students inevitably needed

to rely on their thinking skills to successfully construct a meaning of a reading text and to produce their writing based on the text, their higher-order thinking or cognition was inevitably promoted.

The findings of the present study indicating the effects of CLIL on reading and writing outcomes have yielded support to several previous research studies. For instance, Phoodokmai (2011) explored the effectiveness of the CLIL course on reading and writing skills of 24 science students' in the Thai context. The findings obtained from an achievement test illustrated the students' significant improvement in their reading and writing skills after the CLIL course implementation. Likewise, in a CLIL course to enhance cultural awareness and English communication ability developed by Suwannoppharat (2014), the data gained from the formative assessment processes revealed that 24 Thai undergraduate students in the Chinese International Program achieved a higher degree of development in their individual writing tasks after learning from the feedback for group work writing tasks and discussion with their classmates and the instructor. Similarly, in another research conducted by Tai (2015), the analysis of 57 written assignments revealed that the 19 Japanese undergraduate students in an elective CLIL course on intercultural

communication developed their writing skills in terms of both accuracy and fluency throughout the semester.

Apart from that, the data obtained from the writing tasks in the present study indicated that the students achieved a higher degree of progress in the five aspects of writing, namely, content, organization, vocabulary, language use, and mechanics of writing. Among the five aspects, the data revealed that students improved their writing ability in terms of 'language use' the most. Such findings may have resulted from the use of the instructional materials which enabled the students to be exposed to the language use needed for their writing of the cause and effect text pattern and the process text pattern. That is to say, based on the students' opinions obtained from the interview protocol, the PowerPoint slides as well as the instructional worksheets included writing expressions and the examples, which were beneficial for them when they were assigned to write. Furthermore, the PowerPoint slides which contained the grammatical mistakes of their peers helped them learn to avoid such mistakes and enabled them to write effectively in these text patterns at the end the course. Besides this, the students explained that the instructional materials of each unit in general could promote the practice of writing, and this

eventually resulted in their progress in their writing, particularly in the aspect of language use.

2) The extent to which the CLIL course improved agricultural content of undergraduate students

Based on the findings of the study, it can also be seen that the students showed significant improvement in their agricultural content after attending the 12-week CLIL course. This reflected the effectiveness of CLIL implementation in terms of 'content' which is one of the four components of this educational approach as Coyle et al. (2010), Bently (2010), and Dalton-Puffer (2007) have indicated. Apart from 'the target language,' 'thinking skills,' 'culture,' and 'content' is another major component of CLIL as can be seen from the view of Coyle et al. (2010) and from the view that was postulated on the Internet site called *The CLIL Compendium* (The CLIL Compendium, 2001).

As pointed out by Coyle et al. (2010), CLIL helps promote studying subject matters throughout the course or curriculum. That is, the approach offers students a chance to access the academic content which is in the specific area of their study, and thus students will be highly exposed to CLIL lessons which include authentic texts in the target language. This could thus result in students' better

preparation for their prospective career. Moreover, since the academic subject matters are taught in the target language, students have an opportunity to learn subject-specific target language technical terms (The CLIL Compendium, 2001). This provides them an opportunity to be well-equipped with solid academic subject matters when they have to start their career. To be specific, in this study, the students participating in the CLIL course were majored in agriculture, and the lessons provided them access to the content on the sub-topic areas of agriculture such as ‘Environmental factors that affect plant growth,’ ‘Poultry housing,’ and ‘The marketing mix.’ As a result, the students were exposed to necessary agricultural content as well as agricultural target language terminology. Therefore, it could be concluded that the course helped equipped the students with the tool necessary for them to work in an agricultural industry, both in local and international markets.

In addition to access to subject-specific content and terminology, the vital role of ‘culture’ may help explain the students’ significant improvement in agricultural content. Based on of the framework proposed by Coyle et al. (2010), ‘culture’ is another major component of CLIL. According to Coyle et al., ‘culture’ can refer to intercultural awareness, understanding, or knowledge about self and others. As a consequence, the component may include the knowledge about ways of life in

terms of self and others, which is specifically associated with the subject matters taught in CLIL, and that is why culture can be considered an integral part of the content-specific CLIL lessons. In the present study, each of the CLIL lessons was conceptualized in order to provide the students an opportunity to gain both agricultural content and cultural knowledge specifically related to agriculture. For instance, in Unit 1, the students learned about ‘Environmental factors that affect plant growth’ as a sub-topic of agricultural content, and so as to yield deeper understanding of such a sub-topic, they were also exposed to ‘Water management in Northeast Thailand’ as a sub-topic area of cultural knowledge related to the agricultural content they had learned before. With access to cultural knowledge directly related to the agricultural content, the students’ knowledge on agricultural subject matters were deepened and broadened, which, in turn, could bring about more insight into their knowledge needed in their field of study.

Apart from that, the students’ significant improvement in agricultural content may have been associated with the role of ‘cognition’ which is another component of the CLIL approach. As previously mentioned, CLIL is distinguished from other educational approaches in the way that it connects the learning of specific subject matters with the promotion of thinking skills. As far as Coyle et al.

(2010), renowned experts in the field of CLIL, were concerned, effective content learning relies on not only well-selected knowledge and skills within the course but also cognitive practice. Consequently, ‘cognition’ or ‘thinking ability’ plays an important role when it comes to the learning of specific content. In this study, each of the CLIL lessons focused on fostering both lower and higher-order thinking skills while simultaneously promoting the agricultural content. For example, in Unit 2, after the students had learned about the irrigation methods, to help the students gain the best access to the content, the instructor assigned them to complete a task to come up with an appropriate irrigation method that suited the given agricultural situation in each of the cases. In so doing, they had a chance to practice the lower-order thinking skill, ‘apply,’ as well as the higher-order thinking skill, ‘evaluate,’ by implementing the knowledge of irrigation methods in such given situations and making critical judgements on the most appropriate irrigation method for each of the situations. Simply put, the students were involved with instructional activities that promoted their thinking skills needed for effective learning of the agricultural content while they were learning about the specific subject matters, both of which yielded a desirable outcome of the CLIL implementation.

The success of CLIL in terms of specific content as shown in the present study concurs with the findings reported in the research study conducted by Chostelidoua and Grivab (2014) who examined the effectiveness of the CLIL accountancy program in a Greek setting. According to the findings of the Greek study, the CLIL implementation was effective in terms of development of content knowledge as well as reading skills of the students. That is, in addition to reading skills, the CLIL group (139) significantly outperformed the non-CLIL group (131) in the subject-specific content.

Nonetheless, it is worth noting that, in spite of the students' significant improvement in agricultural content in the present study, the post-test mean score was not at a high level (9.85 out of the total score at 22). This may have been because of the demanded cognitive domain that was also involved in the agricultural content part of the test which required the students to rely on the knowledge they had earlier 'remembered.' According to a Revision of Bloom's Taxonomy of Educational Objectives proposed by Anderson et al. (2001, pp. 67-68), 'remember' refers to the ability to 'retrieve relevant knowledge from long-term memory.' Since the CLIL implementation lasted only 12 weeks, the period of time might not have been sufficient for the students to develop their long-term memory of the required

knowledge, and this could have made them encounter some problems when taking the test that demanded both content knowledge and thinking skills to complete.

3) The extent to which the CLIL course improved cultural knowledge of undergraduate students

According to the findings of the present study, the students' cultural knowledge increased at a significant level after attending the 12-week CLIL course. Such findings helped shed light on the effects of the CLIL implementation in terms of students' development of 'culture,' another major component of the CLIL approach (Coyle et al., 2010), the term specially defined here as an understanding of ways of life in terms of self and others specifically associated with agriculture.

The findings yielded support to the beliefs of a number of CLIL advocates. To illustrate, Sudhoff (2010) has mentioned that the nature of the CLIL course/program, which uses the target language as a tool to gain the content knowledge, allows students to form the connection with the real world, thus contributing to the construction of their cultural identity. Similarly, Pokrivcaková, Menzlová, and Farkašová (2010) have mentioned that, in addition to the target language competence, CLIL provides a great opportunity to develop students' intercultural awareness and knowledge.

In this study, the students were exposed to cultural knowledge which referred to the specific knowledge about ways of life, practices, products, and patterns related to agricultural contexts. To exemplify, Unit 2 of the CLIL course focused on ‘irrigation methods,’ and the students obtained cultural knowledge about ‘Irrigation in Thailand and Malaysia,’ which was concerned with practices of agricultural irrigation that people in Thailand and Malaysia were involved with. As such, this particular CLIL lesson helped the students broaden the scope of their knowledge about ways of life about how they and the people in their neighboring country similarly or differently dealt with various types of irrigation. Such cultural knowledge about self and others is believed to be of benefit to them later on when they have entered their career in agriculture.

In addition to the nature of CLIL which helps promote cultural knowledge related to agriculture, it is worth noting that the students’ acquisition of cultural knowledge took place while their ‘cognition’ or ‘thinking ability’ was being developed. In the present study, the students were provided with instructional tasks that could enhance their cognitive readiness in both lower and higher levels. For instance, in Unit 2 which emphasized ‘Irrigation in Thailand and Malaysia’ as the focused cultural knowledge, the students had an opportunity to practice their lower-

order thinking skill, ‘understand,’ by interpreting the reading text and making a comparison of the irrigation methods being used in the two countries. In addition, they had a chance to practice their higher-order thinking skills, ‘analyze’ and ‘create,’ by identifying the reasons why such methods were used in each country to finally come up with the proposals on how to improve the irrigation system in the two countries. It can be seen that the students were provided with instructional tasks which helped foster their cognitive ability which is vital for effective learning of cultural knowledge related to agricultural content. This may help explain why the students showed significant improvement in terms of their cultural knowledge specifically associated with agricultural content at the end of the CLIL course.

The results of the present study regarding cultural knowledge were consistent with the research result reported by Suwannoppharat (2014) that 24 Thai undergraduate students in a Chinese International Program had a higher mean score of cultural awareness after the implementation of the CLIL course to enhance cultural awareness and English communication ability. Likewise, the results of this study concurred with the research finding in terms of cultural aspects reported by Yamano (2013). In investigating the effects of CLIL implementation in a Japanese setting at the primary level, the responses to the open-ended questions obtained

from 35 CLIL students revealed that the culture part integrated into the lessons helped raise the students' cultural awareness of international matters as well as enabled them to learn how to address such global issues.

Nevertheless, similar to the agricultural content outcomes, despite the students' significant development in cultural knowledge related to agricultural content, the post-test mean score was not at a high level (6.4 out of the total score at 21). This may have resulted from the demanded cognitive domain which was involved in the cultural knowledge part of the test that required the students to depend on the knowledge they had previously 'remembered.' Based on a Revision of Bloom's Taxonomy of Educational Objectives proposed by Anderson (2001, pp. 67-68), 'remember' refers to the ability to 'retrieve relevant knowledge from long-term memory.' Due to the limited period of time of the course implementation, the students might have not adequately develop their long-term memory of the desired knowledge to help them cope with difficulty when they were taking the test.

5.1.2 Students' Opinions Toward the CLIL Course

Several important points can be drawn from both the questionnaire and interview findings.

1) The findings from the opinion questionnaire clearly showed that the participants strongly agreed that the course objective on agricultural content was suitable and that the course content matched the objective on agricultural content. This may reflect the highlight of the CLIL approach, which is, as stated by Bently (2010) and Dalton-Puffer (2007), quite distinctive, when compared to other educational approaches generally applied in a language course. This is because CLIL combines teaching a subject matter with teaching the target language. Hence, unlike other general language or ESP courses, CLIL courses can offer learners the opportunity not only to progress in the target language but also to gain the knowledge in a particular subject matter, which could make the students feel that the course objectives suited the specific language and content needs of the agricultural field of study.

2) Based on the findings from the interviews, the participants had positive opinions toward the course objective and the course content on English writing ability. They agreed that the course objective on English writing ability was the one they liked the most, and that the course content could improve their writing ability to prepare them for subsequent work in agribusiness. Such a positive opinion may involve the nature of writing which is perceived as complex (Weigle, 2002) and

can cause difficulty for undergraduate writers as can be seen in several research studies such as those conducted by Wongsathorn (1993) and Pawapatcharodom (2007). As a result, the participants' opportunity to practice their writing skill through the agricultural content which is specifically associated with their prospective career in the CLIL course may have made them realize how to cope with their writing difficulty and eventually produce a good piece of writing.

3) According to data gained from the interviews, the participants had positive opinions toward the teaching methods and activities as well as on the instructional materials implemented in the CLIL course. Such findings were consistent with what Coyle et al. (2010, p. 3) have pointed out that CLIL is “an educational approach in which various language-supportive methodologies are used which lead to a dual-focused form of instruction where attention is given both to the language and the content.” As Coyle et al. have mentioned, a wide range of instructional methodologies can be applied in a CLIL course. Consequently, in the CLIL course, as reported in the present study, various teaching methods and techniques were implemented. For example, technical terms in the agricultural field were included in the course to help the participants read faster, and the process-based writing approach were applied with embedded language use in the writing session to make

the students write more effectively. Besides, instructional activities such as games and group work were implemented to make the class fun and interesting. Also, as for instructional materials, various instructional materials such as video clips, worksheets, and PowerPoint slides were used to facilitate students' practice of reading and writing and their learning about agricultural content and cultural knowledge. As such, the students may have felt that they were practicing language skills while learning about something that was directly relevant to their interest, hence a positive opinion.

Students' positive opinions elicited in this study may help portray the effectiveness of the CLIL course, not only for language development but also for acquisition of content and culture. Students' positive responses toward the CLIL course were in line with those documented in a number of previous studies. For instance, Papaja (2012) has reported positive opinions of 108 CLIL students from the Department of Psychology of the University of Silesia, Poland, who were satisfied with learning both the English language and the subject matters through CLIL. Similarly, another research study conducted by Soulioti (2014) has indicated the positive opinions toward CLIL implementation of 65 undergraduate students in the Speech and Language Therapy Department of Epirus Institute of Technology in

Greece. That is to say, the results showed that students strongly felt that CLIL helped foster their progress in both language learning and content knowledge. Finally, Chostelidoua and Grivab (2014) indicated that the CLIL group under the CLIL accountancy program at a university level in Greece had more positive opinions toward the course than their peers in the non-CLIL group.

5.3 Implications of the Findings

According to the findings of the present study, the following pedagogical implications can be proposed:

5.3.1 Implications for Language Learners

As can be seen from the findings of the study, the CLIL approach was successful in terms of promoting students' English language abilities, agricultural content, and cultural knowledge. As a result, CLIL should be implemented in a language course or curriculum, particularly an ESP one, so as to provide an opportunity for language learners to simultaneously develop their English language abilities, content in their field of study, and relevant cultural knowledge when participating in the CLIL course. This could help the learners become better prepared to use English and other learning components, such as content in their selected field of study and cultural knowledge, for their subsequent academic studies and their future career. Thus, they should have more advantages over the students in a

traditional classroom who may have a chance to fully develop their language skills but lack the specific content and cultural knowledge necessary for their line of work.

5.3.2 Implications for Language Teachers

First, as previously mentioned, CLIL is beneficial for the students' development of English language abilities, agricultural content, and cultural knowledge. The CLIL principles should be integrated by language teachers into a language course or curriculum to help equip students with the tools they need to progress in their language, content, and cultural knowledge development. In order to have a CLIL course tailored to learners' needs, as claimed by several scholars such as Alejo and Piquer (2010) and Ruiz-Garrido and Fortanet-Gómez (2015), a needs analysis whose significance is well-established in the field of ESP should be conducted to make sure that the implementation the CLIL theoretical framework (the 4cs framework) will best suit the needs of a particular group of language learners. Also, a needs analysis should be carried out with various groups of stakeholders in order to obtain as much and as accurate information about the actual needs through the understanding of all four components of CLIL, namely, communication, content, cognition, and culture as possible.

Second, according to the findings of this study, the CLIL approach has been proved effective for promotion of students' reading and writing abilities. This may

help prove the interconnection between reading and writing skills in the realm of language teaching. That is, reading and writing help improve each other. When reading, students can develop their writing skills by using readings as a good model for writing, and when writing, students have to focus on accurate language use, which may promote their skills in reading. Therefore, it would be beneficial for language learners if instructors of the course design lessons in which both of the skills are concurrently developed.

Third, since the students in this study had positive opinions toward the CLIL course due to various teaching methods and activities employed (e.g., the process-based writing approach which was applied in teaching practicing writing), a language teacher should take a wide range of teaching methodologies into consideration when designing a CLIL course, based on the premise that “CLIL is an educational approach in which various language-supportive methodologies are used” (Coyle et al., 2010, p. 3). In addition, several scholars have suggested that CLIL can be implemented together with other educational approaches such as CLIL plus the task-based approach (Tardieu, 2012) in the setting of France and CLIL plus the project-based approach in the setting of Portugal (Simões, 2013) to further ensure its effectiveness. Therefore, teachers should take different teaching approaches that can be integrated

into CLIL lessons into account when developing a CLIL course to maximize students' development in various aspects: communication, content, culture, and cognition.

Fourth, as the students showed their satisfaction with the course due to use of precise and interesting instructional materials, appropriate materials for specific contexts are needed. This can be seen as a challenge for language teachers who need to design or select the materials which are suitable in terms of both the language aspect and the content aspect, the latter of which might be perceived as something beyond their reach. To solve this problem, language teachers may need to seek collaboration from subject teachers who can help determine and select relevant and appropriate content for the CLIL course. Simply put, to ensure selection of well-designed materials, collaboration between subject teachers and language teachers is vital.

5.3.3 Implications for Administrators and Stakeholders

Due to the benefits of the CLIL course as revealed in the findings of the present study, administrators should facilitate CLIL implementation by encouraging language teachers to participate in CLIL workshops as well as training courses in order to equip them with knowledge and understanding of the basis of CLIL methodology and practice. Besides, administrators may organize workshops or training programs to

ensure collaboration between language teachers and subject teachers, both of whom are considered key players in successful implementation of CLIL.

5.4 Limitations of the Study

This study aimed to investigate the extent to which a CLIL course improved English reading and writing abilities, agricultural content, and cultural knowledge of undergraduate students. As a consequence, other English language skills, such as speaking and listening, were not the foci of the study. Besides, in this study, while English reading and writing abilities, agricultural content, and cultural knowledge of the students were developed, thinking ability was enhanced simultaneously as a by-product based on a premise that all activities required the use of thinking skills. As a result, thinking ability was not promoted or measured separately. Also, due to the fact that the study employed a one-group pre-test post-test design, and the study sample was an intact group of the students majoring in agriculture, generalization of the findings should be made with caution.

5.5 Recommendations for Further Research

Since the present research study was subject to several limitations, the following recommendations, with respect to such aforementioned limitations, are made as follows:

First, this research study investigated the extent to which the CLIL course improved English language abilities, agricultural content, and cultural knowledge of Agricultural Technology students. Hence, further research studies may be conducted with students in other fields of study, such as Science or Information Technology, to explore the extent to which a CLIL course can improve English language abilities, agricultural content, and cultural knowledge of students with different majors.

Second, this research study explored only the extent to which the CLIL course improved the students' English reading and writing abilities. Further research may be carried out to examine the effects of the CLIL course on language learners' development of listening and speaking abilities, or on grammatical competence, so as to better determine the effectiveness of this particular teaching approach.

Third, in this study, during the time that English reading and writing abilities, agricultural content, and cultural knowledge of the students were developed, thinking ability was believed to be enhanced simultaneously as a by-product. Thus, thinking ability was not promoted or measured separately. Therefore, further research may be undertaken to particularly explore the effects of CLIL on thinking ability in order to attain empirical evidence on the effectiveness of CLIL on promotion of students' cognition, one of the key components of the CLIL approach.

Appendices



Appendix A

A Needs Analysis Questionnaire on English Language Skills (Reading and Writing Skills), Thinking Skills, Agricultural Content, and Cultural Knowledge of Agricultural Technology Students, and the Opinions about Development of the Content and Language Integrated Learning (CLIL) Course for Undergraduate Students
(for Agricultural Technology students)

Part A: Demographic Information, and English Language Abilities (Reading and Writing Abilities)

Instructions: Please fill in the information or check (✓) in only one box in the space provided.

1. Gender: Male Female 2. Age:years old
3. Academic year: 1 2 3 4
- Major: Agronomy Soil Science Animal Science Horticulture
 Plant Pest Management Technology Agricultural Development
 Fisheries Science Soil Resources and Environment Management
 Agricultural Communication
4. Foundation English 1 course grade.....Foundation English 2 course grade.....
5. Please rate your English Language Abilities (Reading and Writing Abilities) by checking (✓) in the space provided.

Reading Ability	Meaning
	5 (very good): read effectively and fluently; have no problems in skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose
	4 (good): read fluently; have few problems in skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose

Reading Ability	Meaning
	3 (fair): read fluently but have some problems in skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose
	2 (poor): read quite fluently but have many problems in skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose
	1 (very poor): cannot read; cannot skim the text for main ideas, scan the text for specific information, analyze vocabulary, make a reference, make an inference, and identify the author's purpose

Writing Ability	Meaning
	5 (very good): write effectively and fluently; have no problems in expressing content, making an organization, selecting appropriate vocabulary, using language correctly and appropriately, and spelling, punctuation and capitalization
	4 (good): write fluently; have few problems in expressing content, making an organization, selecting appropriate vocabulary, using language correctly and appropriately, and spelling, punctuation and capitalization
	3 (fair): write fluently but have some problems in expressing content, making an organization, selecting appropriate vocabulary, using language correctly and appropriately, and spelling, punctuation and capitalization
	2 (poor): write quite fluently but have many problems in expressing content, making an organization, selecting appropriate vocabulary, using language correctly and appropriately, and spelling, punctuation and capitalization

Writing Ability	Meaning
	1 (very poor): cannot write; cannot express content, make an organization, select appropriate vocabulary, use language correctly and appropriately; have a lot of problems in spelling, punctuation and capitalization

Part B: English reading and writing skills, and common text patterns in expository writing in agricultural contexts.

Instruction: Please fill in the information or check (✓) in only one box in the space provided.

- 5 means a very important skill
- 4 means an important skill
- 3 means quite an important skill
- 2 means not so important a skill
- 1 means not an important skill

Part B1: English reading skills in agricultural contexts

Please identify the importance of each skill of reading English in agricultural contexts.

Skills in Reading	Level of Importance				
	5	4	3	2	1
1. Skimming the text for main ideas					
2. Scanning the text for specific information					
3. Analyzing vocabulary					
4. Making a reference					
5. Making an inference					
6. Identifying the author's purpose					
7. Others (Please specify) _____ _____					

Part B2: English writing skills in agricultural contexts

Please identify the importance of each skill of writing English in agricultural contexts.

Skills in Writing	Level of Importance				
	5	4	3	2	1
1. Expressing content					
2. Making an organization					
3. Selecting appropriate vocabulary					
4. Using language correctly and appropriately					
5. Spelling					
6. Punctuation					
7. Capitalization					
8. Writing procedures					
8.1 Outlining					
8.2 Writing					
8.3 Editing					
9. Others (Please specify.) _____					

Part B3: Text patterns in expository writing in agricultural contexts

Please identify the importance of text patterns in agricultural contexts.

Text Patterns	Level of Importance				
	5	4	3	2	1
1. Description (e.g. describing plant parts or soil components)					
2. Process (e.g. describing how to breed and make breed improvement)					
3. Comparison and contrast (e.g. comparing and contrasting particular plants)					
4. Cause and effect (e.g. explaining causes and effects of breeding and making breed improvement)					
5. Problem and solution (e.g. describing a particular production problem in agribusiness and discussing possible solutions to the problem)					
7. Others (Please specify.) _____					

Part C: Thinking skills

Instruction: Please identify the importance of each skill of thinking needed for learning an English for Academic Purposes course by checking (✓) in only one box in the space provided.

5 means a very important skill

4 means an important skill

3 means quite an important skill

2 means not so important a skill

1 means not an important skill

Skills in Thinking	Level of Importance				
	5	4	3	2	1
1. Remember (retrieving knowledge from long-term memory)					
2. Understand (determining the meaning of instructional messages, including oral, written, and graphic communication by exemplifying, classifying, summarizing, inferring, comparing, and explaining)					
3. Apply (carrying out or using a procedure in a given situation by executing and implementing)					
4. Analyze (breaking material into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose)					
5. Evaluate (making judgments based on criteria and standards)					
6. Create (putting elements together to form coherent and original whole which can be in the form of a piece of writing, an oral message, or a product)					

Part D: Agricultural content

Instruction: Please identify the importance of each topic of agricultural content by checking (✓) in only one box in the space provided.

5 means a very important topic

4 means an important topic

3 means quite an important topic

2 means not so important a topic

1 means not an important topic

Topics of Agricultural Content	Level of Importance				
	5	4	3	2	1
1. Plant production					
1.1 Biology related to plants					
1.2 Origin and classification of the cultivated crops					
1.3 Plant introduction					
1.4 Crop improvement and propagation					
1.5 The influences of environmental factors on crop production					
1.7 Harvesting					
1.8 Storage					
1.9 Processing and marketing of the products					
2. Animal production					
2.1 Farm management					
2.2 Feeds and feeding					
2.3 Breeds and breed improvement					
2.4 Hygiene and disease prevention					
2.5 Processing					
2.6 Importance of animal industry					

Topics of Agricultural Content	Level of Importance				
	5	4	3	2	1
3. Principles of agricultural economics					
3.1 The principle of agricultural economics and its applications to agricultural production					
3.2 Consumption					
3.3 Marketing					
3.4 Organization and agribusiness					
3.5 Land tenure					
3.6 Credit and other related problems					
3.7 Thai agricultural structure					
3.8 Gross national products					
3.9 Agricultural development					

Part E: Cultural knowledge

Instruction: Please identify importance of each area of culture knowledge by checking (✓) in only one box in the space provided.

5 means a very important area

4 means an important area

3 means quite an important area

2 means not so important area

1 means not an important area

Topics of Cultural Knowledge	Level of Importance				
	5	4	3	2	1
1. Information about <u>products</u> in agricultural contexts (such as plants, animals, or agricultural tools)					
2. Information about <u>practices</u> that members of the culture carry out individually or with others in agricultural contexts (such as agricultural irrigation that a member or the members of the culture carry out)					

Topics of Cultural Knowledge	Level of Importance				
	5	4	3	2	1
3. Information about <i>perspectives</i> in agricultural contexts, which can be the perceptions, beliefs, values, or attitudes that underlie the products and that guide persons and communities in the practices of the culture (such as attitudes of the members of the culture on farming)					
4. Culture knowledge in agricultural contexts in Thailand as a whole (such as agricultural irrigation carried out in Thailand as a whole)					
5. Culture knowledge in agricultural contexts in many parts of Thailand (such as agricultural irrigation carried out in the central part or the southern part of Thailand)					
6. Culture knowledge in agricultural contexts in member countries of ASEAN (such as agricultural irrigation carried out in member countries of ASEAN)					
7. Culture knowledge in agricultural contexts in countries beyond ASEAN (such as agricultural irrigation carried out in countries beyond ASEAN)					

Part F: Opinions about Development of the Content and Language Integrated Learning (CLIL) Course for Undergraduate Students from Faculty of Agricultural Technology

Instruction: Please check (✓) in only one box in the space provided.

5 means strongly agree

4 means agree

3 means neutral

2 means disagree

1 means strongly disagree

Opinions about Development of CLIL Course for Undergraduate Students from Faculty of Agricultural Technology	5	4	3	2	1
1. Focus on course objectives on English language abilities (Reading and writing abilities)					
2. Focus on course objectives on thinking abilities (Please see Part C: Thinking skills)					
3. Focus on course objectives on agricultural content (Please see Part D: Agricultural content)					
4. Focus on course objectives on cultural knowledge (Please see Part E: Culture knowledge)					
5. Focus on vocabulary					
6. Focus on grammar					
7. Use of English in teaching					
8. Use of Thai in teaching					
9. Focus on individual work					
10. Focus on pair work					
11. Focus on group work					
12. Focus on self-study					
13. Use of PowerPoint presentation					
14. Use of VDO					
15. Use of other instructional materials (Please specify.) _____ _____					
16. Use of exercises as an evaluation method					
17. Use of tests as an evaluation method					
18. Use other evaluation methods (Please specify.) _____ _____					

Appendix B

Needs Analysis Interview Questions on English Language Skills (Reading and Writing Skills), Thinking Skills, Agricultural Content, and Cultural Knowledge of Agricultural Technology Students, and the Opinions about Development of the Content and Language Integrated Learning (CLIL) Course for Undergraduate Students (for Agricultural Technology students)

1. In your academic studies, to what extent do you read in English in agricultural contexts?
2. In your academic studies, in what ways do you read in English in agricultural contexts? (such as reading academic/research articles, reading texts)
3. In your academic studies, what reading skills do you think are the most important when you read in English in agricultural contexts? Why?

(In this research study, the reading skills include skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose.)

4. In your academic studies, to what extent do you write in English in agricultural contexts?
5. In your academic studies, in what ways do you write in English in agricultural contexts? (such as writing academic/research articles, writing reports)
6. In your academic studies, what writing skills do you think are the most important when you read in English in agricultural contexts? Why?

(In this research study, the writing skills include expressing content, making an organization, selecting appropriate vocabulary, using language correctly and appropriately, and having no problems in spelling, punctuation and capitalization.)

7. What are common text patterns you use when writing in English in agricultural contexts?

(In this research study, the common text patterns include description, process, comparison and contrast, cause and effect, and problem and solution.)

8. Which text patterns do you think are the most important for you when writing in English in agricultural contexts? Why?

(In this research study, the text patterns include description, process, comparison and contrast, cause and effect, and problem and solution.)

9. In your academic studies, to what extent do you use your thinking skills (remember, understand, apply, analyze, evaluate, and create)?

10. In your academic studies, in what ways do you use your thinking skills (remember, understand, apply, analyze, evaluate, and create)?

11. What thinking skills (remember, understand, apply, analyze, evaluate, and create) do you think are the most important in studying the CLIL course? Why?

12. In studying the English for the CLIL course, what sub-topics* do you think are the most important for each of the three content areas (principles of crop production, principles of animal production, and principles of agricultural economics)? Why?

13. In studying the CLIL course, what areas of cultural knowledge* do you think are the most important? Why?

14. On which of the four components of CLIL (English language abilities, agricultural content, thinking skills, and cultural knowledge) should the CLIL course place the strongest emphasis? Why?

15. What is the best proportion of the use of English and Thai in the English for the CLIL course? Why?

16. What activities and materials that you prefer in the CLIL course? Why?
17. What evaluation methods do you prefer in the CLIL course? Why?
18. What are your suggestions and expectations for development of the CLIL course?
19. What do you want from King Monkut's Institute of Technology Ladkrabang to prepare Agricultural Technology students to work in the future?



Appendix C

Lesson Plan

Unit 1

Course Code/Title: English for Academic Purposes

Credits: 3(2-1)

Level: The second-, third- or, fourth-year undergraduate students at the Faculty of
Agricultural Technology

Prerequisites: Foundation English 1 and Foundation English 2

Unit 1: Environmental Factors that Affect Plant Growth

Unit's Objectives:

1. Students will be able to understand the sub-topic of agricultural content: Environmental Factors that Affect Plant Growth.
2. Students will be able to find the main idea and interpret English reading texts concerning the sub-topic on Environmental Factors that Affect Plant Growth.
3. Students will be able to write a paragraph in English in agricultural contexts with the cause and effect text pattern.
4. Students will be able to remember, understand, and analyze the agricultural content they have learned.
5. Students will be able to understand the cultural knowledge in agricultural contexts, on the sub-topic area of Water Management in Northeast Thailand.

Class duration: 6 hours (2 sessions with three hours per session)

Evaluation:

1. Students complete reading tasks after reading.
2. Students complete a culture task.
3. Students write a cause and effect paragraph.
4. Students are engaged in wrap-up discussion.

Materials:

1. PowerPoint slides
2. A video clip
3. Worksheets

Teaching and learning procedures:

Phase 1: Lead-in (15 minutes - Session 1)

Objectives:

1. Direct students' attention to the two pictures shown on the slides in PowerPoint presentation. Ask students questions: what is difference between the two types of plants? what is the cause of the unhealthy plants?
2. Allow students to share their ideas, which can be genetic factors or environmental factors that affect plant growth.
3. Lead students to the sub-topic of agricultural content: Environmental Factors that Affect Plant Growth, and activate students' background on that topic by asking students questions: what do you think are environmental factors that affect plant growth? How do they affect plant growth?

Phase 2: Delivering the Content (2 hours 45 minutes - Session 1)

Step 1a: Delivering the content, and practicing reading skill and the cognitive skill 'understand' (1 hour 15 minutes)

Objectives:

1. Students will be able to understand the sub-topic of agricultural content, Environmental Factors that Affect Plant Growth.
2. Students will be able to find the main idea and interpret English reading texts concerning the sub-topic on Environmental Factors that Affect Plant Growth.
3. Students will be able to understand the content they have learned.

Materials: PowerPoint presentation, Worksheet 1a: Environmental Factors that Affect Plant Growth

Teaching and learning procedures:

1. Ask students to read a reading text Environmental Factors that Affect Plant Growth, and to answer the questions below the reading text in the worksheet. (They are supposed to read individually, but they can discuss the text with their classmates in pairs or small groups.)
2. Discuss the answers with students, and guide them how to use their reading strategies (such as skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose) while reading in order to understand the text. Also, alert students that academic reading texts were mostly written to teach a particular lesson. Thus, the author's purpose of the genre of writing is to inform something to the audience.
3. Let students list key vocabularies found in the text, and discuss the meanings with students.
4. Ask students to summarize the content they have read.

Step 1b: Delivering the content, and practicing reading skill and the cognitive skills ‘understand’ and ‘analyze’ (30 minutes)

Objectives:

1. Students will be able to understand the sub-topic of agricultural content: ‘Environmental Factors that Affect Plant Growth, with the focus on the ‘light’ factor.
2. Students will be able to understand and analyze the content they have learned.

Materials: PowerPoint presentation, Worksheet 1b: Light

Teaching and learning procedures:

1. Ask students to work in pairs to read a reading text concerning Light, and to complete the diagram below the reading text in the worksheet.
2. Discuss the answers with students, and guide them how to analyze a piece of information (by letting them learn the skills to ‘analyze’ is the skill in breaking that particular piece of information into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose);
3. Let students list key vocabularies found in the text, and discuss the meanings with students.
4. Ask students to summarize the content they have read.

Step 2: Delivering the cultural knowledge, and practicing the cognitive skill ‘understand’ (1 hour)

Objective:

Students will be able to understand culture knowledge in agricultural contexts, on the sub-topic area of Water Management in Northeast Thailand.

Materials: PowerPoint presentation, Worksheet 2: Water Management in Northeast Thailand

Teaching and learning procedures:

1. Ask students to work in groups of four or five, and ask them to think about 1) the demographic information of Northeast Thailand, such as its geography, population, agricultural practices and products, 2) water problems in the region, and 3) the solutions. Let them discuss and share the ideas.

2. Ask students to remain in the same group, and study the worksheet and answer the questions

3. Discuss the answers with students.

Step 3: Delivering the content, and practicing writing skill and the cognitive skills 'create' (2 hours 15 minutes- Session 2)

Objective:

Students will be able to write a paragraph in English in agricultural contexts with the cause and effect text pattern.

Materials: PowerPoint presentation, Video clip: Watch the Corn Grow (Retrieved March, 19, 2014, from <http://www.youtube.com/watch?v=Miyjun0uD4g>), Worksheet 3.1: Sample Cause and Effect Paragraph: Effects of temperature on corn growth, Worksheet 3.2: The Basic Parts of a Paragraph, Worksheet 3.3: Cause and Effect Paragraph, Worksheet 3.4: Cause and Effect Paragraph Writing Assignment

Teaching and learning procedures:

1. Review what students have learned in the previous session of the unit, Environmental Factors that Affect Plant Growth.

2. Ask what students have come across about effects of environmental factors on a particular plant. Let them brainstorm, and then share the ideas to class.

3. Lead students to the writing activity, how to write a cause and effect paragraph to analyze effects of environmental factors on a particular plant.

4. Direct students' attention to the video clip: Watch the Corn Grow, which is time lapse from the KCRG-TV web camera watching the "Farmer Josh" corn field near Marion Iowa between June and October of 2009. Ask students: what crop they

can see from the video clip? Let students share their ideas, and tell them the answer.

5. Ask students to study Worksheet 3.1: Sample Cause and Effect Paragraph: Effects of temperature on corn growth.

6. Ask students to analyze parts of a basic paragraph. Also, hand on to them Worksheet 3.2: The Basic Parts of a Paragraph.

7. Ask students to analyze transitional words and expressions for cause and effect. Also, hand on to them Worksheet 3.3: Cause and Effect Paragraph: Transitional Expressions for Cause and Effect.

Outlining

1. Ask students to work in pairs to study the writing prompt for the writing assignment, provided in Worksheet 3.4: Cause and Effect Paragraph Writing Assignment

2. Ask each pair of the students to write the outline of the paragraph by writing the topic sentence, the first main effect and its supporting details, the effect main point and its supporting details, the third main effect and its supporting details, and the concluding sentence. Teacher walk around to give them support.

Writing

Ask each pair of the students to write the first draft of the paragraph.

Reviewing and editing

1. Let each pair of the students review their work by using the checklist in Review Checklist included in Worksheet 3.4: Cause and Effect Paragraph Writing Assignment as a guideline.

2. Let each pair of the students exchange their writing to do the peer reviewing by completing Peer Reviewing Form included in Worksheet 3.4: Cause and Effect Paragraph Writing Assignment.

3. Let the writers and the reviewers discuss their writings to share the ideas of each other.

4. Ask each pair of the students to review and edit their writing as their homework to submit it to teacher in the following class. Tell them to write the paragraph in the space provided in Worksheet 3.4: Cause and Effect Paragraph Writing Assignment.

Phase 3: Wrap-up (15 minutes - Session 2)

1. Allow students to review what they have learned by asking them to work in groups.

2. Ask volunteer groups of students to report their summary to the whole class.



ENVIRONMENTAL FACTORS THAT AFFECT PLANT GROWTH

Plant growth and distribution are limited by the environment. If any one environmental factor is less than ideal it will become a limiting factor in plant growth. Limiting factors are also responsible for the geography of plant distribution. For example, only plants adapted to limited amounts of water can live in deserts. Most plant problems are caused by environmental stress, either directly or indirectly. Therefore, it is important to understand the environmental aspects that affect plant growth. These factors are light, temperature, water, and nutrition.

Light

Light is a climatic factor that is essential in the production of chlorophyll and in photosynthesis, the process by which plants **manufacture** food in the form of sugar (carbohydrate). Light is that visible portion of the solar radiation or electromagnetic spectrum. It is a form of kinetic energy that comes from the sun in tiny particles called *quanta* or *photons*, travelling in waves. Three properties of this climatic factor that affect plant growth and development are *light quality*, *light intensity*, and *daylength or photoperiod*. **Light quality** refers to the specific wavelengths of light; **light intensity** is the degree of brightness that a plant receives; and **day length** is the duration of the day with respect to the night period.

Temperature

The degree of hotness or coldness of a substance is called **temperature**. It is commonly expressed in degree Celsius or centigrade (C) and degree Fahrenheit (F). This climatic factor influences all plant growth processes such as photosynthesis and respiration. That is to say, such a factor affects the productivity of a plant. At high temperatures the translocation of photosynthate is faster so that plants tend to **mature** earlier.

In general, plants survive within a temperature range of 0 to 50 C. Enzyme activity and the rate of most chemical reactions generally increase with rise in temperature. Up to a certain point, there is doubling of enzymatic reaction with every 10 C temperature increase. However, at excessively high temperatures, denaturation of enzymes and other proteins occur. Excessively low temperatures can

also cause limiting effects on plant growth and development. For example, water absorption is inhibited when the soil temperature is low because water is more viscous at low temperatures and less mobile, and the protoplasm is less permeable.

Water

Water is a primary component of photosynthesis. The importance of water in plants can be negated in some cases. As with other climatic factors, water can possibly cause unfavorable effects on plant growth and development. Excess water in the soil can injure flood prone plants, like corn (maize), due to lack of oxygen. In this case water stress due to flooding means oxygen stress by deficiency (hypoxia) or total absence (anoxia). Apart from that, excess water within the plant can also cause injury. That is, under conditions that favor high absorption and low transpiration rates, there is build-up of high turgor pressure in the region of cell elongation which causes maximum swelling of the cells. This results to the development of leggy seedlings. Likewise, under similar conditions, growth cracks occur as exemplified by bursting heads of cabbage and cracked fruits of tomato and roots of carrot and sweet potato.

Nutrition

Many people confuse plant **nutrition** with plant **fertilization**. Plant nutrition refers to the needs and uses of the basic chemical elements in the plant. Fertilization is the term used when these materials are supplied to the environment around the plant. A lot must happen before a chemical element supplied in a fertilizer can be taken up and used by the plant.

Plants need 18 elements for normal growth, and most of them are **dissolved** in water and then absorbed by the roots. Among the 18 elements, Carbon, hydrogen, and oxygen are found in air and water, while Nitrogen, phosphorus, potassium, magnesium, calcium, and sulfur are found in the soil. The latter six elements are used in relatively large amounts by the plant and are called macronutrients. There are nine other elements that are used in much smaller amounts; these are called micronutrients or trace elements. The micronutrients, which are found in the soil are

iron, zinc, molybdenum, nickel, manganese, boron, copper, cobalt, and chlorine. All 18 elements, both macronutrients and micronutrients are essential for plant growth.

Elements essential as building blocks for compounds synthesized by plants.

See Hopkins' Cafe—mighty good, managed by cousins Mona and Cloco.



carbon hydrogen oxygen phosphorus potassium nitrogen sulphur calcium iron magnesium manganese boron copper zinc molybdenum sodium chlorine cobalt
 C H O P K N S Ca Fe Mg Mn B Cu Zn Mo Na Cl Co

(Adapted from

Source:

Bareja, B.G. (2011). Climatic factors promote or inhibit plant growth and development. Retrieved January, 22, 2014, from <http://www.cropsreview.com/climatic-factors.html>

Bareja, B.G. (2011). *The importance of water in plants and in crop agriculture: A climatic factor*. Retrieved January, 22, 2014, from <http://www.cropsreview.com/importance-of-water.html>

College of Agriculture, the University of Arizona. (2014). *Environment factors that affect plant growth*. Retrieved January, 22, 2014, from <http://ag.arizona.edu/pubs/gardenmg/botany/environmental.html>

1. What is the text mainly about?

- a. how genetic and environmental factors have an influence on plant growth
- b. how external surroundings in which a plant grows have an influence on it
- c. how to grow a plant in a place with problematic environmental factors
- d. how to grow a plant that has genetic problems

2. How is light important to plant growth?

- a. It is necessary in photosynthesis, the production by a green plant of special substances like sugar that it uses as food of plants.
- b. It is essential in the production of chlorophyll which is important in releasing sugar out of plants
- c. It is energy that comes from the sun in very small particles which travel in waves
- d. It can be seen as portion of the solar radiation or electromagnetic spectrum

3. Which of the following is NOT the light property affecting plant growth?

- a. the definite wavelengths of light
- b. the degree of brightness that a plant receives
- c. the day period with respect to the night period
- d. the color or wavelength reaching the plant surface

4. What does 'which' in the 2nd paragraph refer to?

- a. factor
- b. food
- c. chlorophyll
- d. photosynthesis

5. According to the text, what does 'manufacture' in the 2nd paragraph mean?

- a. limit
- b. remove
- c. produce
- d. influence

6. When it comes to plant production, which of the following is NOT affected by temperature?

- a. growth processes
- b. solar radiation
- c. plant productivity
- d. water absorption

7. According to the text, what does 'mature' in the 3rd paragraph mean?

- a. be found
- b. be injured
- c. stand
- d. grow

8. In general cases, which of the following is NOT the proper temperature in which plants can survive?

- a. 70
- b. 50
- c. 10
- d. 30

9. How can excess water injure plants?

- a. Excess water in the soil can cause lack of oxygen which leads to water stress.
- b. Excess water within the plant can cause lack of oxygen which leads to water stress.
- c. Excess water in the soil can cause plants to be conditions that favor high absorption and low transpiration rates.
- d. Excess water within the plant oxygen stress by deficiency (hypoxia) or total absence (anoxia).

10. According to the text, when it comes to plant production, what is TRUE about the nutrition factor?

- a. It can be considered as fertilizer.
- b. The two main types: macronutrients and micronutrients are necessary for plant growth.
- c. It refers to the uses of the basic chemical elements to the environment around the plant
- d. Macronutrients can be called as trace elements

11. What does 'that' in the 2nd paragraph refer to?

- a. excess water in the soil
- b. deficiency or total absence
- c. excess water within the plant
- d. conditions that favor high absorption and low transpiration rates

12. What can be inferred about the nutrition factor from the text?

- a. There are other types of the basic elements in addition macronutrients and micronutrients.
- b. There are sub-types of macronutrients and of micronutrients.
- c. Some of the 18 basic elements are not dissolved in water.
- d. All of the basic elements need water to be dissolved.

13. What is the author's purpose of writing?

Worksheet 1a: Environmental Factors that Affect Plant Growth

Key Vocabulary

distribution (uncount. n.)- the way in which something is shared out among a group or spread over an area

photosynthesis (uncount. n.)- the production by a green plant of special substances like sugar that it uses as food, caused by the action of sunlight on chlorophyll (=the green substance in leaves)

portion (count. n.)- a part of something larger, especially a part that is different from the other parts

radiation (uncount. n.)- energy in the form of heat or light that is sent out as waves that you cannot see

kinetic (adj.)- relating to movement

respiration (uncount. n.)- the process of breathing

translocate (v.)- [*with object*] *Physiology & Biochemistry* transport (a dissolved substance) within an organism, especially in the phloem of a plant, or actively across a cell membrane

photosynthate (count. n.)- a sugar or other substance made by photosynthesis

denature (v.) [*with object*] (often as adjective **denatured**)-take away or alter the natural qualities of

absorption (uncount. n.)- a process in which something takes in liquid, gas, or heat

viscous (adj.)- a viscous liquid is thick and sticky and does not flow easily

permeable (adj.)- material that is permeable allows water, gas etc to pass through it

negate (v.) [*transitive*] formal- to prevent something from having any effect

deficiency (uncount. n.)- a lack of something that is necessary [= shortage]

transpiration (uncount. n.)-the process of passing water through the surface of a plant's leaves [↪ respiration]

turgor (mass n.)- the state of turgidity and resulting rigidity of cells or tissues, typically due to the absorption of fluid

elongate (v.) [intransitive and transitive]-to become longer, or make something longer than normal

-elongation (uncount. and count. n.)

leggy (adj.)- a leggy plant has grown too tall very quickly and its stem cannot support its weight very well

seedling (count. n.)- a young plant or tree grown from a seed

exemplify (v.) *past tense and past participle exemplified*- to give an example of something

nutrition (uncount. n.)-the process of giving or getting the right type of food for good health and growth

fertilization (mass n.)- the action or process of fertilizing an egg or a female animal or plant, involving the fusion of male and female gametes to form a zygote

dissolve (v.)- [intransitive and transitive] if a solid dissolves, or if you dissolve it, it mixes with a liquid and becomes part of it

Worksheet 1b: Light

Instructions: Read the following text, and complete the diagram.

LIGHT

Light has three principal characteristics that affect plant growth: quantity, quality, and duration.

Light quantity refers to the intensity or concentration of sunlight and varies with the season of the year. The maximum is present in the summer and the minimum in winter. The more sunlight a plant receives (up to a point), the better capacity it has to produce plant food through photosynthesis. As the sunlight quantity decreases the photosynthetic process decreases. Light quantity can be decreased in a garden or greenhouse by using shade-cloth or shading paint above the plants. It can be increased by surrounding plants with white or reflective material or supplemental lights.

Light quality refers to the color or wavelength reaching the plant surface. Sunlight can be broken up by a prism into respective colors of red, orange, yellow, green, blue, indigo, and violet. On a rainy day, raindrops act as tiny prisms and break the sunlight into these colors producing a rainbow. Red and blue light have the greatest effect on plant growth. Green light is least effective to plants as most plants reflect green light and absorb very little. It is this reflected light that makes them appear green. Blue light is primarily responsible for vegetative growth or leaf growth. Red light when combined with blue light, encourages flowering in plants. Fluorescent or cool-white light is high in the blue range of light quality and is used to encourage leafy growth. These lights are excellent for starting seedlings. Incandescent light is high in the red or orange range but generally produces too much heat to be a valuable light source. Fluorescent "grow" lights have a mixture of red and blue colors that attempts to imitate sunlight as closely as possible. They are costly and generally not of any greater value than regular fluorescent lights.

Light duration or photoperiod refers to the amount of time that a plant is exposed to sunlight. When the concept of photoperiod was first recognized it was

thought that the length of periods of light triggered flowering. The various categories of response were named according to the light length (i.e., short-day and long-day). It was then discovered that it is not the length of the light period but the length of uninterrupted dark periods that is critical to floral development. The ability of many plants to flower is controlled by photoperiod.

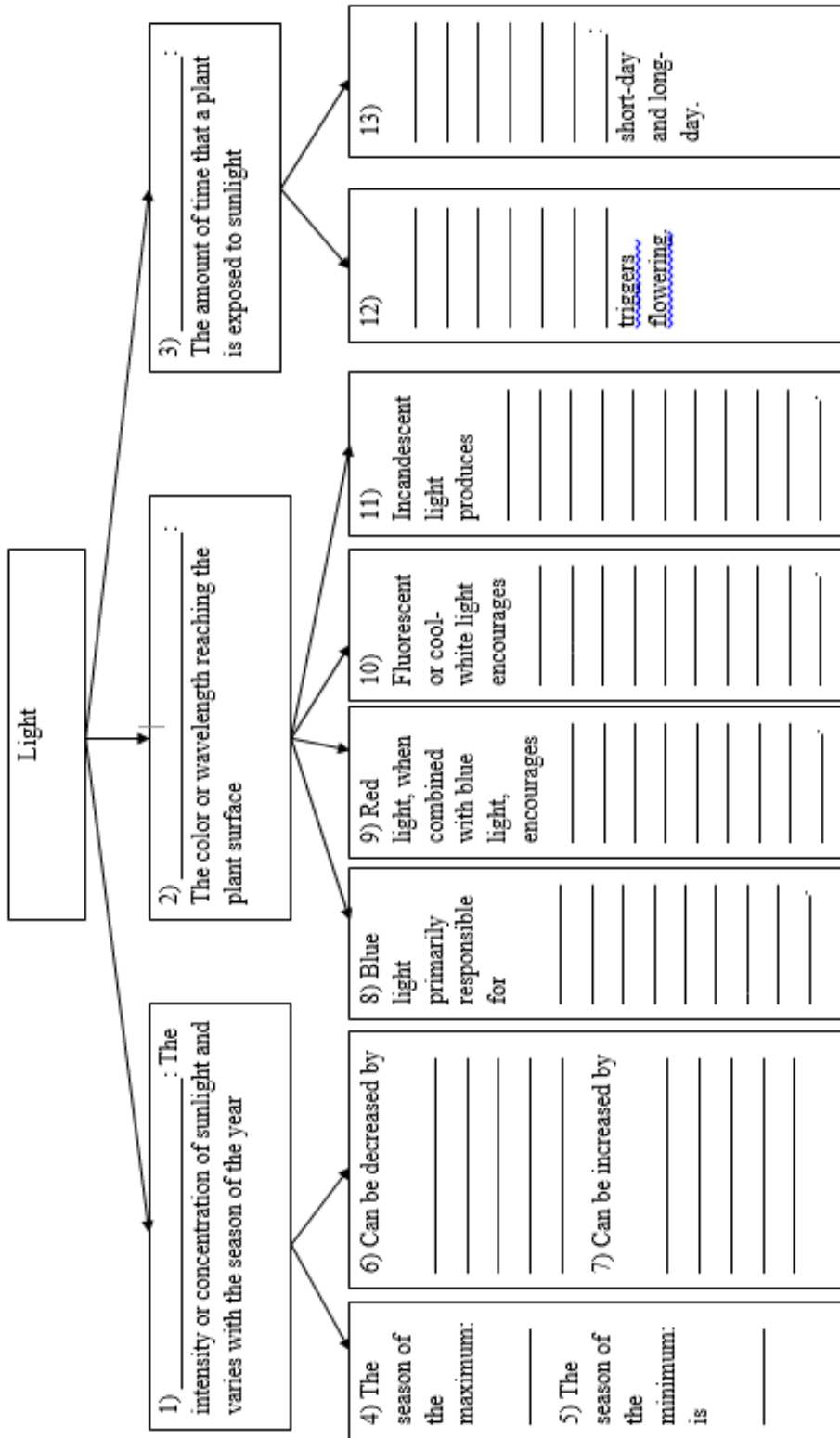
Adapted from

Source:

College of Agriculture, the University of Arizona. (2014). *Environment factors that affect plant growth*. Retrieved January, 22, 2014, from <http://ag.arizona.edu/pubs/gardenmg/botany/environmental.html>



Worksheet 1b: Light



Worksheet 1b: Light

Key Vocabulary

principal (v.) [only before noun]-most important [= main]

supplement (count. n.)-something that you add to something else to improve it or make it complete

respective (adj.) [only before noun]-used before a plural noun to refer to the different things that belong to each separate person or thing mentioned

indigo (uncount. n.)-a dark purple-blue color

tiny (adj.)-tiny

incandescent (adj.)-producing a bright light when heated

photoperiod- the period of time each day during which an organism receives illumination; day length

trigger (v.)- make something such as a bomb or electrical system start to operate

Worksheet 2: Water Management in Northeast Thailand

Source:

de Vries, F. P. and Ruaysoongnern, S. (2010). *Multiple sources of water for multiple purposes in Northeast Thailand*. IWMI Working Paper 137. International Water Management Institute. Khon Kaen University, Khon Kaen, Retrieved January, 26, 2014, from http://www.iwmi.cgiar.org/Publications/Working_Papers/working/WOR137.pdf

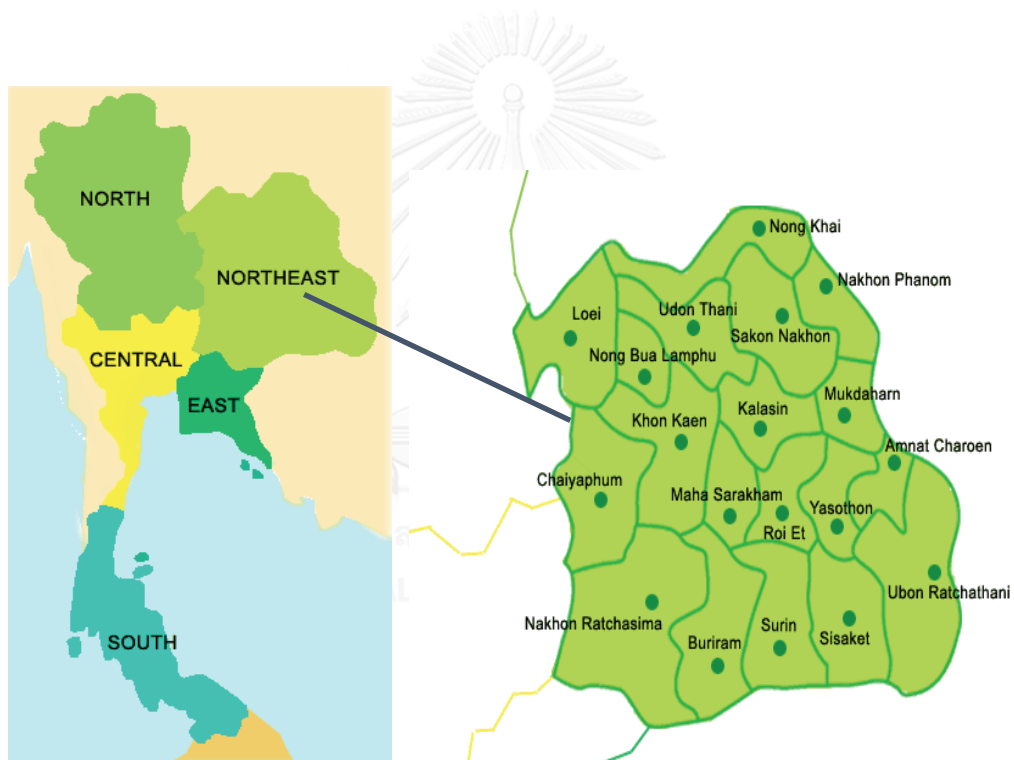


Figure 1. The five regions of Thailand and the 19 provinces in the Northeast.

Geography, and Population

- Thailand is divided into five parts: North, Northeast, Central, East and South (Figure 1).
- The northern and eastern borders of the northeast are formed by the Mekong River.
- The northeast is slightly cooler and drier than the other parts of the country. (Thailand has three seasons: a hot and dry season, a rainy season, and a cool dry season.)
- Intensive rain occurs in 4–5 months but it has an uneven and irregular distribution that often causes local floods and droughts within the same year.
- Farms in Northeast Thailand suffer often from droughts in the dry season and sometimes even in the rainy season. The reason is that much of the ample annual rainfall is not retained on the farms.
- People cultivate rain-fed crops on most of the arable land. Rice paddies are common in the lowland areas. Farms also annually produce 4–5 crops of vegetables, including bean, cabbage and onion that are often sold to middlemen. Some farmers produce and sell fish while others grow trees for convenience wood (e.g., teak, eucalyptus) for sale when cash is needed.

(Some farms pump water from wells but deep groundwater is often saline.)

Water Management and Development Problems

- The decline in the quality of farmland and water resources in the northeast has caused a decline in productivity and subsequently in farm income and an increase in poverty.
- Since the early and mid-1990s farmer organizations have promoted the adjustment of farming practices to reverse degradation. This adjustment often included the construction of a farm pond, crop diversification and recycling. The government supported the local communities with small-scale irrigation systems and some types of farm ponds. Yet, these were hardly used due to high cost and inappropriate design and placement on farms. Such movement to construct ponds on farms increased the capacity to store water in a significant manner. It was observed that on homesteads with ponds, pond water was used for many purposes: mainly to irrigate crops and fruit trees, and for livestock or fish, and even in homes when water from

cleaner sources was unavailable. With more diverse and productive activities, homesteads with ponds produce nearly all food they need, and probably enjoy a slightly higher income than those without ponds. Pond water is used even when ample piped water is available.

- In 2000, the Government of Thailand approved a program to provide revolving funds to villages for development initiatives and in 2004 a program to dig 450,000 simple farm ponds.

The provision of piped water to households is a recent development, and many villages have already been reached by programs. Primarily to promote rural health, an NGO, the Population and Community Development Association (PDA) has implemented piped water systems in over 120 villages (18,000 households).

- The government has begun to promote the expansion of community water supply systems as well. The water is extracted from reservoirs or large and deep borewells (10–50 m depth) and managed by local authorities as a community or government service (district level). Users pay a fee for the water they use. Nowadays, all villages and many of the farms near villages have electricity which allows them to use pumps to extract water from wells, ponds or canals.

Water and Self-Sufficiency

- The evolution in top-down and bottom-up thinking for rural development was stimulated strongly by His Majesty King Bhumibol Adulyadej of Thailand. He presented his New Theory in 1987 as a holistic approach to stimulate new thinking about water resource rehabilitation, integrated farming and community development. Figure 2 graphically shows the concept: diversification of production and resources, recycling, farm ponds, and conservation of natural resources. Food processing was proposed to generate income from excess produce. In 1996, the concept was expanded with flood management in ‘monkey cheeks,’ which are spaces reserved to store excess water.

- The concept of a Sufficiency Economy was incorporated in the National Economic and Social Development Plan of 2002.



Figure 2. An image of a Thai farm according to the New Theory



Worksheet 2: Water Management in Northeast Thailand

Instructions: Study the information about water management in Northeast Thailand, and answer the questions below

1. What types of crops are mostly cultivated in Northeast Thailand?

2. When cash is needed, what agricultural practices have been done in Northeast Thailand?

3. Although intensive rain occurs in 4–5 months, why are there droughts in Northeast Thailand?

4. Apart from droughts, what disaster does Northeast Thailand have to cope with? What is the cause?

5. Before the support of the government and the private sector, what did people in Northeast Thailand do to cope with droughts?

6. Since the early and mid-1990s, who has promoted the adjustment of farming practices to reverse degradation?

7. What activities are included in the adjustment of farming practices to reverse degradation?

8. In spite of the support of the government, what problems occurred to the irrigation systems and farm ponds?

9. For what purposes is pond water used? Is pond water used when piped water is available?

10. From 2000 to 2004, what happened to the irrigation systems and farm ponds in Northeast Thailand?

11. To promote rural health, what has an NGO, the Population and Community Development Association (PDA) implemented?

12. To promote the expansion of community water supply systems, what has the government has done?

13. What is the Sufficiency Economy concept?

Worksheet 3.1: Sample Cause and Effect Paragraph

Effects of temperature on corn growth

Temperature, as having been considered as one of the environmental factors, has an influence on corn growth in two main aspects. First, low temperatures either slow down the plant growth or cause freeze damage. To be more specific, the optimal average temperatures for corn growth range between 68 and 73°F. Consequently, the plant growth decreases once temperature drops to about 41°F, and the severity depends on other factors such as duration and corn growth stage. To illustrate, extended low temperatures at seedling stage that reduce the soil temperatures to below freezing two inches below the surface may kill corn. Apart from low temperatures, high temperatures result in corn yield. That is to say, corn yield may also be reduced due to high air temperatures (95°F and higher) during pollination. High temperatures during this time can cause damage to pollination if plants are under drought stress. During moisture stress, especially at low relative humidity, high temperatures can desiccate silks and damage or kill pollen. Nevertheless, pollination will not be affected by high temperatures if there is adequate moisture in the soil, because pollen shed usually occurs during morning hours. To conclude, both very high and low temperatures can affect corn production, and the severity may range from the slowdown of the plant growth to the death of the plant.

Adapted from

Wiatrak, P. (2014). *Environmental conditions affecting corn growth*. Retrieved January, 22, 2014, from http://www.clemson.edu/extension/rowcrops/corn/guide/environmental_conditions.html

Worksheet 3.2: The Basic Parts of a Paragraph

Topic Sentence

The topic sentence tells the reader what the paragraph is going to be about. So, it introduces the main idea of the paragraph. Since it helps keep your writing under control, a topic sentence is sometimes called the "controlling idea" of a paragraph. Not always, but quite often, the topic sentence is the first sentence in a paragraph. In order to write the topic sentence, you are supposed to summarize the main idea of your paragraph, and indicate to the reader what your paragraph will be about.

The following is the topic sentence of the sample paragraph:

Topic sentence: The lack of rain and snow has horrible effects on farmers.

Body

The body is the main part of the paragraph. It comes after the topic sentence, and gives details to develop and support the main idea of the paragraph. To make your writing come alive, all of the sentences in the body should contain details that make the topic more interesting or help explain it more clearly. Besides, these sentences should be organized in the best possible order. So as to come up with the effective body of the paragraph, you have to give clear and adequate supporting facts, details, and examples.

Concluding Sentence(s)

The concluding or closing sentence comes after all the details have been included in the body of the paragraph. As a result, it is the last sentence in a paragraph. The concluding sentence restates the main idea of your paragraph. You can write the concluding sentence by restating the main idea of the paragraph using different words.

The following is the concluding sentence of the sample paragraph:

Concluding sentence: As a farmer's daughter, I have experienced some good times and some bad times. I have gained a great respect for farmers everywhere.

Adapted from

TestDEN. (2014). Parts of a paragraph. Retrieved January, 27, 2014, from

<http://www.testden.com/toefl/writing-tutorial/parts-of-a-paragraph.htm>

The San Juan Unified School District, San Juan, New Mexico. (2014). *The basic*

parts of a paragraph. Retrieved January, 27, 2014, from

<http://www.occc.edu/mschneberger/howtoparagraph.htm>

Worksheet 3.3: Cause and Effect Paragraph

A **cause** is a reason for, or events leading up to. An **effect** is the results of a cause or causes.

A cause and effect paragraph analyzes the causes or effects of a certain situation.

Language Focus: Using Verbs to Express Cause and Effect

The following verbs are used to signal the reader that you will express cause and effect relationship in the topic sentence, the supporting details, and the concluding sentence.

cause	affect
result in	lead to
bring about	

Examples from the model paragraph

Low temperatures either slow down the plant growth or **cause** freeze damage.
(cause) *(effect)*

Apart from low temperatures, high temperatures **result in** corn yield.
(cause) *(effect)*

both very high and low temperatures can **affect** corn production....
(cause) *(effect)*

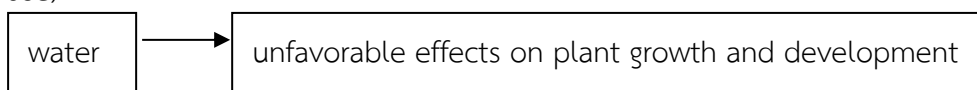
Note:

cause (noun phrase)	cause affect + result in + lead to bring about	effect (noun phrase)
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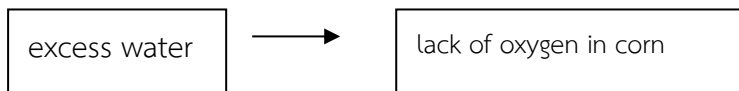
Exercise

Instructions: Write a cause and effect sentence for each item by using the verb given in the brackets to help you combine the two noun phrases.

1. (cause)



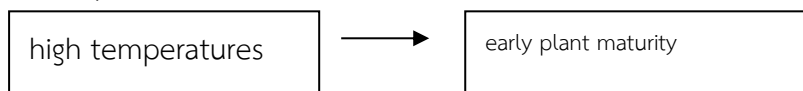
2. (result in)



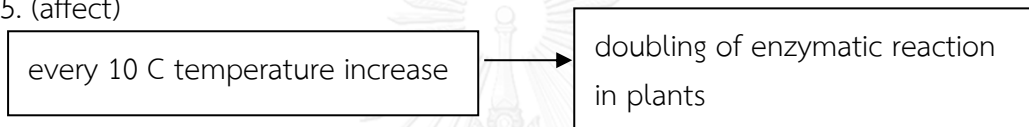
3. (lead to)



4. (result in)



5. (affect)



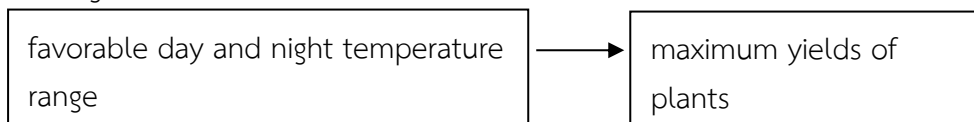
6. (cause)



7. (bring about)



8. (bring about)



9. (affect)



10. (lead to)



Sources:

- (2014). *Cause and effect paragraphs*. Retrieved January, 27, 2014, from <http://english120.pbworks.com/w/page/19006810/cause%20and%20effect%20paragraphs>
- Bareja, B.G. (2011). Climatic factors promote or inhibit plant growth and development. Retrieved January, 22, 2014, from <http://www.cropsreview.com/climatic-factors.html>
- Bareja, B.G. (2011). *The importance of water in plants and in crop agriculture: A climatic factor*. Retrieved January, 22, 2014, from <http://www.cropsreview.com/importance-of-water.html>
- College of Agriculture, the University of Arizona. (2014). *Environment factors that affect plant growth*. Retrieved January, 22, 2014, from <http://ag.arizona.edu/pubs/gardenmg/botany/environmental.html>
- Pardede, P. (2014). *Paragraphs of cause-effect*. Retrieved January, 27, 2014, from <http://myreadwritebooster.wordpress.com/writing-3/2-paragraph-writing/11-paragraphs-of-cause-effect/>
- Sugahara, V.Y. and Takaki, M. (2004). Effect of light and temperature on seed germination in guava (*Psidium guajava* L. - Myrtaceae). *Seed Science and Technology*, 32 (3), October, 759-764(6). Retrieved April, 24, 2014, from <http://www.ingentaconnect.com/content/ista/sst/2004/00000032/00000003/art00011>

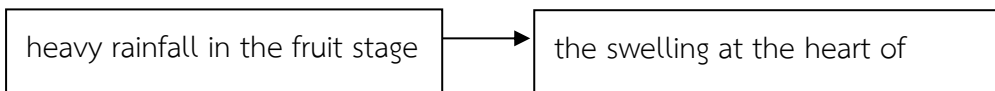
Worksheet 3.4: Cause and Effect Paragraph Writing Assignment

Writing Focus: effects of heavy rains on a watermelon plant

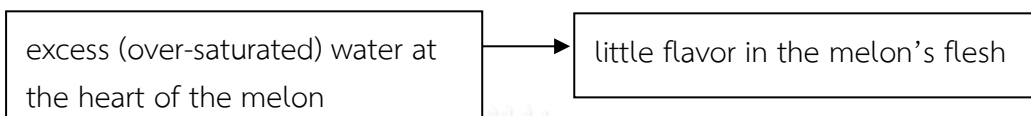
Writing Prompts:

1. White Hearts

a.



b.

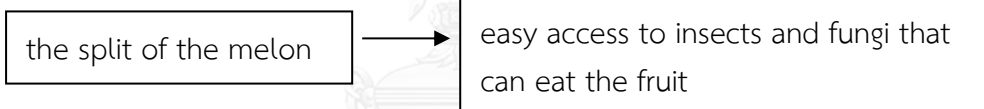


2. Melon bursting

a.



b.



Adapted from

Castele, J. (2014). *What is the effect of too much rain on watermelons?* Retrieved January, 22, 2014, from <http://homeguides.sfgate.com/effect-much-rain-watermelons-75177.html>

Worksheet 3.4: Cause and Effect Paragraph Writing Assignment

Outline

Topic sentence:

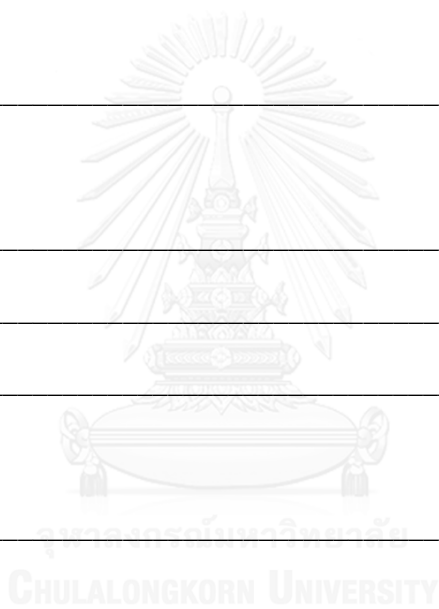
First main effect:

Supporting details:

Second main effect:

Supporting details:

Concluding sentence:



Worksheet 3.4: Cause and Effect Paragraph Writing Assignment

Review Checklist

Instruction: Use the following checklist to review your work.

1. Does the topic sentence clearly state a controlling idea to show point of view, opinion, or attitude toward the subject?
2. Is every sentence related to the topic sentence?
3. Are details organized in a logical way?
4. Does the concluding sentence end the paragraph effectively?
5. Is there adequate information about the topic?
6. Are verbs to express cause and effect used effectively to connect the ideas?

Worksheet 3.4: Cause and Effect Paragraph Writing Assignment

Peer Reviewing Form

Instruction: Read your friends' work, and complete the peer reviewing form.

1. Does the topic sentence clearly state a controlling idea to show point of view, opinion, or attitude toward the subject? _____
If not, what revision is needed to make it effective? _____

2. Is every sentence related to the topic sentence? _____
If not, which sentence is not related to the topic sentence? _____

3. Are details organized in a logical way? _____
If not, which part of the paragraph needs a revision? _____

4. Does the concluding sentence end the paragraph effectively? _____
If not, what revision is needed to make it effective? _____

5. Is there adequate information about the topic? _____
If not, which should be added in the paragraph? _____

6. Are verbs to express cause and effect used effectively to connect the ideas? ____
If not, which verbs seem to be a problem? _____

7. Did you notice any word, sentence, or punctuation errors that the writer needs to edit? ____

If yes, use a pencil to make notes in the margins of your friends' paper, or personally alert them to the error.

Writers' names: 1) _____ 2) _____

Reviewers' names: 1) _____ 2) _____

Appendix D

The CLIL TestPART A: READING (23 items; 1 hour)

Name (in Thai): _____ **Student ID:** _____
Major (in Thai): _____

Reading Text 1 (12 items; item 1-12)

Instructions: Read the following reading text. Then answer the questions or complete the items by marking X in the box for one best choice for each item, or writing NOT MORE THAN THREE WORDS for each blank, in the answer sheet.

- (1) The National Organic Agriculture Committee have discussed new action plans for developing Thai organic agriculture industry. These have been implemented from 2014 to 2016.
- (2) The first plan focuses on managing knowledge and creating organic agriculture database. The second plan emphasizes developing supply chains. They will be linked from upstream to downstream processing.
- (3) The third plan aims at improving the marketing and Thai organic agriculture standards. Besides, it aims to build confidence in Thai organic products by using the brand promotion technique to increase the goods quality and quantity.
- (4) In the fourth plan, the committee will encourage all relevant units to develop Thai organic agriculture by setting up a central unit.
- (5) The government will translate these plans into action by forming working groups. They will comprise those from the public and private sectors.
- (6) Organic agriculture has become important. Therefore, in 2012, the government approved to establish the National Organic Agriculture Committee. The committee includes members from several units. They work together to set policies for Thai organic agriculture.

(7) The world market for organic agricultural products has **expanded** rapidly. So, Thailand has a good chance of exporting **such products**. There is a high demand of Thai organic products in the international market, but the market size is small. Major markets are the United States and the European Union, followed by Japan and Australia. Also, the Asian markets for the products in China, Singapore, and Vietnam are growing. Thai organic agricultural exports are rice, black tiger prawn, beef, milk, and fish.

1. The text mainly discusses _____.

- a. how to solve marketing problems of Thai organic agriculture
- b. the origin of The National Organic Agriculture Committee
- c. new strategies which support Thai organic agriculture
- d. creating brands of Thai organic agriculture in Asia

2. When did the new plans mentioned in the text start?

3. What is **NOT** included in the four action plans?

- a. developing a database for organic agriculture
- b. creating supply chains of organic agriculture
- c. improving standards of Thai organic goods
- d. setting up a central unit at the regional levels

4. What does 'it' in the 3rd paragraph refer to?

5. What does '**comprise**' in the 5th paragraph mean?

- a. include
- b. relate
- c. increase
- d. reflect

6. The National Organic Agriculture Committee _____.

- a. has been established three years ago
- b. include both the private and public sectors
- c. has been approved to establish due to the economic crisis
- d. is mainly responsible for creating plans for Thai organic agriculture

7. The two largest world markets of Thai organic agricultural products are

1) _____ 2) _____.

8. Name two Thai organic agricultural exports.

1) _____ 2) _____

9. What does 'expanded' in the 7th paragraph mean?

- a. changed
- b. grown
- c. shown
- d. reduced

10. What does 'such products' in the 7th paragraph refer to?

11. It can be inferred that _____ is LARGEST market of Thai organic agricultural products in ASIA.

- a. Japan
- b. Vietnam
- c. China
- d. Singapore

12. The author's purpose is to _____.

- a. advertise Thai organic products to the audience
- b. inform the audience about new strategies on Thai organic agriculture
- c. suggest the audience how to solve problems of Thai organic agriculture
- d. persuade the audience to support the work of the National Organic Agricultural Committee

Reading Text 2 (11 items; item 13-23)

Instructions: Read the following reading text. Then answer the questions or complete the items by marking X in the box for one best choice for each item, or writing NOT MORE THAN THREE WORDS for each blank, in the answer sheet.

- (1) Indian poultry industry sells most of its product through wet markets. These wet markets cause many hygienic problems and are far from some consumers to reach.
- (2) According to Adel Yusupov, the regional director of U.S. Grains, India's poultry production is as good as the United States, but a small number of Indian consumers purchase processed poultry products. However, the director believes the Indian poultry industry will be successful in selling these products to the consumer.
- (3) Consumer education is important in solving this problem. Indian consumers believe that they can buy a fresher and healthier product at a wet market. Such beliefs make them prefer wet market products. They do not know that processed products can be superior, in terms of quality control and hygiene.
- (4) The U.S. Grains Council organized a lot of seminars to educate people in Indian poultry industry about how to run a campaign to promote processed poultry products. At a seminar, the speaker from PT Sierad Produce in Indonesia shared experience on their success. There were also other speakers from Thailand and Sri Lanka.
- (5) Indian poultry is the fourth largest in the world, and it is one of the biggest consumers of corn in India. If the poultry industry continues to grow, India could export more corn, and they will become a net importer of grains and co-products in the future.

13. What is the text mainly about?

- a. The effects on processed food in India
- b. The future of India's poultry industry
- c. Health problems caused by India's poultry production
- d. India's poultry production and hunger in rural areas

14. According to the reading text, wet markets can _____.

- a. serve buyers who live far from them
- b. attract visitors from other countries
- c. cause health problems to the consumer
- d. offer food choices to the consumer

15. What does 'purchase' in the 2nd paragraph mean?

- a. buy
- b. change
- c. share
- d. produce

16. India's poultry production _____.

- a. is worse than the United States'
- b. is moving to processed markets
- c. hardly sells the products on wet markets
- d. consumes less corn and grains than the U.S. does

17. Who is Adel Yusupov?

- a. the seminar speaker from the U.S.
- b. the seminar speaker from Sri Lanka
- c. the director of PT Sierad Produce
- d. the regional director of U.S. Grains Council

18. 'Such beliefs' in the 3rd paragraph refers to the beliefs that wet markets products are _____.

19. What does 'superior' in the 3rd paragraph mean?

- a. various b. specific c. better d. more active

20. The U.S. Grains Council organized seminars for people in Indian poultry production in order to _____.

- a. persuade them to sell their products in the world markets
b. discuss the current situation of the import of corn in India
c. offer them a chance to meet with people from top countries' poultry industry
d. show them how to start a campaign to promote processed poultry products

21. PT Sierad Produce in the 4th paragraph _____.

- a. has imported more and more corn
b. has made processed poultry products popular
c. is as good as the United States' poultry industry
d. is better than Thai poultry industry.

22. In the near future, India _____.

- a. may import instead of export corn
b. may become one of the top largest corn exporters.
c. can produce more corn than the US.
d. can produce more grains and co-products than the US.

23. The author's purpose is to _____.

- a. promote India's poultry products in the international markets
- b. persuade poultry companies to invest in India's poultry industry
- c. inform the audience the current situation of India's poultry industry
- d. report the role of India's poultry products in the Southeast Asian markets



The CLIL Test

PART B: WRITING (2 tasks; 1 hour)

Name (in Thai): _____ Student ID: _____ Major (in Thai): _____
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Part B: Writing

Task 1: Effects of low temperature on mango trees

Instructions: Study the information below, and, in the space provided, write a paragraph describing the effects of low temperature on mango trees.

Effects of low temperature on mango trees

Effect 1: Effects on <u>young trees</u> and mature <u>trees</u>	Temperature < 30 degrees Fahrenheit → <u>trees</u> : severely damaged or killed
	Temperature < 25 degrees Fahrenheit → <u>leaves</u> and branches: injured
Effect 2: Effects on <u>flowers and</u> <u>fruits</u>	Temperature < 40 degrees Fahrenheit → <u>flowers</u> and fruits: damaged or dropped off
	Temperature < 55-60 degrees Fahrenheit → <u>flower</u> production: slowed down

Task 2: How to prevent chicken diseases

Instructions: Study the information below, and, in the space provided, write a paragraph describing how to prevent chicken diseases.

How to prevent chicken diseases

Step 1: keep/ <u>chicken</u> / clean	<input type="text" value="keep/ equipment and facilities/ clean"/>
	<input type="text" value="not introduce/ no new chickens / to a flock"/>
Step 2: keep/ <u>coop</u> <u>surfaces</u> / clean	<input type="text" value="use/ a detergent"/>
	<input type="text" value="use/ chemical substances, e.g., hydrogen peroxide, iodine and chlorine / to kill infectious organisms"/>
Step 3: vaccinate/ <u>chickens</u>	when there is <input type="text" value="a disease problem in the past"/>
	when there is <input type="text" value="an introduction of new birds"/>

10. Storm water affects poultry farming by causing _____.

- a. erosion problems
- b. odor problems
- c. excess of litter offsite
- d. change of wind flow pattern

11. What is needed if prevailing winds were toward the residence?

- a. adequate drainage for the poultry house
- b. water and electricity for the poultry house
- c. greater distance from the poultry house location to any residence
- d. several buildings located between the poultry house and the residence

12. Which direction should the windows of the coop and outside run face to allow maximum exposure to the sun?

- a. east
- b. west
- c. north
- d. south

13. Poultry housing normally requires the environment that is

_____.

- a. dry and spacious
- b. warm and humid
- c. well-drained and filled with birds
- d. well-equipped and filled with moisture

14. The most important reason to build a poultry house with a concrete floor and walls is that this will _____.

- a. make the house strong for hilly landscape
- b. protect the house from strong wind
- c. save the birds from predators
- d. prevent odors to reach a residence

15. If you have up to 15,000 birds on your chicken farms, the best suggestion is to _____.

- a. use natural ventilation
- b. use forced air ventilation
- c. raise them in low and flat areas
- d. stop using fence and covered runs

16. PEST _____.

- a. is the elements of the micro-environment in marketing planning
- b. is the elements of the macro-environment in marketing planning
- c. stands for the People, Experience, Science and Technology elements
- d. stands for the Political, Economic, Social and Telecommunication elements

17. Which of the following TRUE about marketing?

- a. The marketing environment involves activities to make the product available to consumers
- b. The final stage in marketing planning is understanding the marketing setting.
- c. The macro- and micro-environment sometimes can be controlled by a company.
- d. Marketers never play a part in setting the PEST agenda.

18. Which of the following does NOT reflect 'As the macro-environment shifts, so does the micro-environment'?

- a. Health has been the focus of attention among adults of new generations.
- b. Online food retailers have increased due to the popularity of the Internet.
- c. The pizza delivery has been introduced due to technological developments.
- d. Facebook has been used as a channel to contact with new generation consumers.

19. The marketing mix is _____.

- a. a set of controllable tools of a product's marketing plan
- b. the factors that affect the overall operation of a micro-business
- c. a list of methods used to evaluate the strengths, weaknesses of a marketing project
- d. the objectives the company's marketers expect to achieve at different time periods

20. As for marketing tactics, 'place' refers to _____.

- a. the goods kept at warehouse
- b. a company's storage of goods
- c. an area where the goods are promoted
- d. channels that make the product available to consumers

21. In Thailand, Lay's, a potato chip brand name, finds Nadech and Yaya to increase selling the new flavor of 'spicy food' is the marketing tactic on _____.

- a. product
- b. price
- c. promotion
- d. place

22. Which of the following does NOT show the 'adaptation' strategy of McDonald's in order to suit customer's tastes?

- a. In Peru, Inca Kola is served on the menu.
- b. The Mc Zulu burger is served with flat bread in South Africa.
- c. McDonald's in Morocco supply a grilled chicken sandwich served on a flat bread.
- d. In China, McDonald's use Yao Ming, a Chinese basketball player, to promote hamburgers.

3. What were the problems of the adjustment of farming practice?

- a. high cost and rejections from some farmers
- b. lack of support from the public and private sectors
- c. lack of cooperation among farmers in each community
- d. high cost and inappropriate design and placement on farms

4. Which of the following is TRUE?

- a. Irrigation in Thailand and in Malaysia started in the 15th century.
- b. Irrigation in Thailand and in Malaysia started in the 18th century.
- c. Irrigation in Thailand started in the 15th century, while that in Malaysia started in the 18th century.
- d. Irrigation in Malaysia started in the 15th century, while that in Thailand started in the 18th century.

5. Up to now, _____ has been mainly used in the irrigation schemes in Thailand.

- a. flood irrigation
- b. drip irrigation
- c. spray irrigation
- d. the center-pivot systems

6. The RID (Royal Irrigation Department) was created _____.

- a. at the beginning of the eighteenth century
- b. to maintain water in canals for irrigation and navigation
- c. before canal construction for irrigation started
- d. to manage irrigation systems for both wet and dry seasons.

7. Modern irrigation methods are _____.

- a. widely used in Thailand, but not in Malaysia
- b. widely used in Malaysia, but not in Thailand
- c. widely used in both Thailand and Malaysia
- d. not widely used in either Thailand or Malaysia

8. A chicken breeder farm should be located _____.

- a. near a poultry slaughterhouse
- b. near a live poultry market
- c. in an open area with well-drained land
- d. in a wet area with clean water

9. A chicken breeder farm should be located at least _____ kilometers from bird collection area.

- a. 3
- b. 5
- c. 7
- d. 10

10. A disease spreads in Jirayu's chicken breeder farm. This may be because _____.

- a. there is one entrance and exit of the rearing area
- b. there is separated disposal area
- c. it is located near a bird collection area
- d. it has an area in line with houses

11. Kaew separated and distanced the accommodation of her chicken breeder farm away from the rearing area, and egg culling and storage. What she did is one of effective ways to _____.

- a. avoid environmental problems
- b. protect the birds from loud noise
- c. avoid risks from chemical hazards on birds
- d. prevent and control infection in the farm

12. Which type of poultry production system account for the most of the total poultry population?

- a. traditional
- b. semi-intensive
- c. intensive
- d. both semi-intensive and intensive

13. In housing of semi-intensive poultry system, _____.

- a. enclosures are made with highly technological materials
- b. biosecurity measures are used for disease prevention
- c. evaporative-cooling systems are commonly found
- d. birds are not kept in backyards or gardens

14. In housing of intensive poultry system, _____.

- a. advanced infrastructure are often used
- b. birds are provided with locally manufactured animal feeds
- c. makeshift enclosures are made with local building materials
- d. evaporative-cooling systems are used

15. Which countries are likely to be the most promising target markets of retailers doing e-commerce agribusiness?

- a. Singapore and Indonesia
- b. Indonesia and Vietnam
- c. The Philippines and Indonesia
- d. The Philippines and Vietnam

16. When considering online shopping preferences in ASEAN, doing agribusiness is _____ promising.

- a. not
- b. fairly
- c. quite
- d. really

17. Which of the following is NOT one of the main problems for online shopping?

- a. lack of convenience
- b. lack of trust in online retailers
- c. problems about return policies
- d. not having tried purchasing online in the past

18. Which of the following is TRUE about rice marketing in Thailand?

(18.1) There is (a) no government intervention or (b) government intervention, and, roughly, Thailand's rice export accounted for (18.2) (c) one third or (d) half of total rice production.

- a. (b) and (d)
- b. (b) and (c)
- c. (a) and (c)
- d. (a) and (d)

19. The product strategy of Thailand's rice marketing is focusing on _____, and multiple uses of rice.

- a. average-quality rice and average package sizes
- b. average-quality rice and different package sizes
- c. low-quality rice and average package sizes
- d. rice quality and different package sizes

20. What is the price strategy of Thailand's rice marketing?

- a. Price is determined by free market.
- b. Standard price is determined by the government.
- c. Standard price is determined by both free market and the government.
- d. Price is determined by a global rice organization.

21. The promotion strategy of Thailand's rice marketing is _____.

- a. not emphasized by Thai government or private sectors.
- b. emphasized by Thai government and private sectors
- c. emphasized by Thai government only.
- d. emphasized by private sectors only.

Appendix E

Scoring Rubric

The scoring rubric was based on analytic scales in ESL created by Jacobs et

al. (1981: 30)

ESL COMPOSITION PROFILE		
score	level	criteria
comments		
30-27		<u>content criteria</u> EXCELLENT TO VERY GOOD: knowledgeable • substantive • thorough development of thesis • relevant to assigned
26-22		topic GOOD TO AVERAGE: some knowledge of subject • adequate range • <u>limited development of thesis</u> • mostly
21-17		relevant to topic, but <u>lacks detail</u>
16-13		FAIR TO POOR: limited knowledge of subject • little substance • <u>inadequate development of topic</u> VERY POOR: does not show knowledge of subject • non- substantive • not pertinent • OR not enough to evaluate
20-18		<u>organization criteria</u> EXCELLENT TO VERY GOOD: fluent expression • ideas clearly stated/ supported • succinct • well-organized • logical sequencing • cohesive

ESL COMPOSITION PROFILE (Cont.)

ESL COMPOSITION PROFILE		
score	level	criteria
comments		
17-14	GOOD TO AVERAGE:	somewhat choppy • loosely organized but main ideas stand out • limited support • logical but incomplete sequencing
13-10	FAIR TO POOR:	non-fluent • ideas confused or disconnected • lacks logical sequencing and development
9-7	VERY POOR:	does not communicate • no organization • OR not enough to evaluate
<u>vocabulary criteria</u>		
20-18	EXCELLENT TO VERY GOOD:	sophisticated range • effective word/idiom choice and usage • word form mastery • appropriate register
17-14	GOOD TO AVERAGE:	adequate range • occasional errors of word/idiom form, choice, usage but meaning not obscured
13-10	FAIR TO POOR:	limited range • frequent errors of word/idiom form, choice, usage • meaning confused or obscured
9-7	VERY POOR:	essentially translation • little knowledge of English vocabulary, idioms, word form • OR not enough to evaluate

ESL COMPOSITION PROFILE (Cont.)

ESL COMPOSITION PROFILE		
score	level	criteria
comments		
		<u>language use criteria</u>
25-22	EXCELLENT TO VERY GOOD:	<u>effective complex</u> constructions • few errors of agreement, tense, number, word order/function, articles, pronouns, prepositions
21-18	GOOD TO AVERAGE:	effective but simple constructions • <u>minor problems</u> in complex constructions • several errors of agreement, <u>tense</u> , number, word order/function, articles, <u>pronouns</u> , prepositions but meaning seldom obscured
17-11	FAIR TO POOR:	major problems in simple/complex constructions • frequent errors of negation, <u>agreement</u> , tense, number, word order/function, <u>articles</u> , <u>pronouns</u> , <u>prepositions</u> and/or <u>fragments</u> , <u>run-ons</u> , deletions • meaning confused or obscured
10-5	VERY POOR:	virtually no mastery of sentence construction rules • dominated by errors • does not communicate • OR not enough to evaluate

ESL COMPOSITION PROFILE (Cont.)

ESL COMPOSITION PROFILE		
score	level	criteria
comments		
		<u>mechanics criteria</u>
5	EXCELLENT TO VERY GOOD:	demonstrates mastery of conventions • few errors of spelling, punctuation, capitalization, paragraphing
4	EXCELLENT TO VERY GOOD:	demonstrates mastery of conventions • few errors of spelling, punctuation, capitalization, paragraphing
3	GOOD TO AVERAGE:	occasional errors of spelling, <u>punctuation</u> , capitalization, <u>paragraphing</u> but meaning not obscured
2	FAIR TO POOR:	frequent errors of <u>spelling</u> , punctuation, <u>capitalization</u> , paragraphing • poor handwriting • meaning confused or obscured
	VERY POOR:	no mastery of conventions • dominated by errors of spelling, punctuation, capitalization, paragraphing • handwriting illegible • OR not enough to evaluate

Appendix F

An Opinion Questionnaire on the Content and Language Integrated Learning (CLIL) Course to Enhance English Language Abilities, and Agricultural Content and Cultural Knowledge of Undergraduate Students

Part A: Demographic Information and English Language Abilities (Reading and Writing Abilities)

Instructions: Please fill in the information or check (✓) in only one box in the space provided.

1. Gender: Male Female 2. Age: years old

3. Academic year: 1st 2nd 3rd 4th

Major: Agronomy Soil Science Horticulture Animal Science

Plant Pest Management Technology Fisheries Science

Agricultural Development Agricultural Communication

Soil Resources and Environment Management

4. Foundation English 1 course grade..... Foundation English 2 course grade.....

5. Please rate your English Language Abilities (Reading and Writing Abilities) by checking (✓) in the space provided.

Reading ability	Meaning
	<p>5 (very good): read effectively and fluently; have no problems in skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose</p>
	<p>4 (good): read fluently; have few problems in skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose</p>
	<p>3 (fair): read fluently but have some problems in skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose</p>
	<p>2 (poor): read quite fluently but have many problems in skimming the text for main ideas, scanning the text for specific information, analyzing vocabulary, making a reference, making an inference, and identifying the author's purpose</p>
	<p>1 (very poor): cannot read; cannot skim the text for main ideas, scan the text for specific information, analyze vocabulary, make a reference, make an inference, and identify the author's purpose</p>

Writing ability	Meaning
	<p>5 (very good): write effectively and fluently; have no problems in expressing content, making an organization, selecting appropriate vocabulary, using language correctly and appropriately, and spelling, punctuation and capitalization</p>
	<p>4 (good): write fluently; have few problems in expressing content, making an organization, selecting appropriate vocabulary, using language correctly and appropriately, and spelling, punctuation and capitalization</p>
	<p>3 (fair): write fluently but have some problems in expressing content, making an organization, selecting appropriate vocabulary, using language correctly and appropriately, and spelling, punctuation and capitalization</p>
	<p>2 (poor): write quite fluently but have many problems in expressing content, making an organization, selecting appropriate vocabulary, using language correctly and appropriately, and spelling, punctuation and capitalization</p>
	<p>1 (very poor): cannot write; cannot express content, make an organization, select appropriate vocabulary, use language correctly and appropriately; have a lot of problems in spelling, punctuation and capitalization</p>

Part B: Opinions after Attending the CLIL Course

Instruction: Please check (✓) in only one box in the space provided.

5 means strongly agree

4 means agree

3 means neutral

2 means disagree

1 means strongly disagree

Opinions after Attending the CLIL Course	Level of Opinions				
	5	4	3	2	1
Course objectives and course content					
1. The course objective on English <u>reading</u> ability is suitable.					
2. The course objective on English <u>writing</u> ability is suitable.					
3. The course objective on <u>thinking</u> ability is suitable.					
4. The course objective on <u>agricultural content</u> is suitable.					
5. The course objective on <u>cultural knowledge</u> is suitable.					
6. The course content matches the objective on English <u>reading</u> ability					
7. The course content matches the objective on English <u>writing</u> ability					
8. The course content matches the objective on <u>thinking</u> ability.					
9. The course content matches the objective on <u>agricultural content</u> .					

Opinions after Attending the CLIL Course	Level of Opinions			
10. The course content matches the objective on <u>cultural knowledge</u> .				
11. The content of each unit is suitable for the time allocated (6 hours per unit; two sessions per unit; twelve sessions per course).				
12. The course content can improve my <u>reading</u> ability to work in agribusiness.				
13. The course content can improve my <u>writing</u> ability to work in agribusiness.				
14. The <u>agricultural content</u> of the course can improve my ability to work in agribusiness.				
15. The <u>cultural knowledge</u> of the course can improve my ability to work in agribusiness.				
Teaching methods and activities				
16. The teaching methods and activities of each unit in general can improve my <u>reading</u> ability.				
17. The teaching methods and activities of each unit in general can improve my <u>writing</u> ability.				
18. The teaching methods and activities of each unit in general can promote learning the <u>agricultural content</u> .				
19. The teaching methods and activities of each unit in general can promote learning the <u>cultural knowledge</u> .				

Opinions after Attending the CLIL Course	Level of Opinions			
20. There is a wide range of teaching methods and activities.				
21. I like working in pairs.				
22. I like working in groups.				
Instructional materials				
23. The instructional materials of each unit in general can promote practicing <u>reading</u> .				
24. The instructional materials of each unit in general can promote practicing <u>writing</u> .				
25. The instructional materials of each unit in general can promote learning the <u>agricultural content</u> .				
26. The instructional materials of each unit in general can promote learning the <u>cultural knowledge</u> .				
27. The instructional materials are interesting.				
Evaluation				
28. The evaluation methods are suitable.				
29. There is a clear explanation of the evaluation criteria before evaluating my writing.				
Instructor				
30. The instructor is well-prepared in terms of the course contents, the teaching methods, and the instructional materials.				

Opinions after Attending the CLIL Course	Level of Opinions				
31. The instructor has a good relationship with students.					
Overall impression					
32. The course is beneficial for my further studies.					
33. The course is beneficial for my future career.					

Additional comments and suggestions on the Content and Language Integrated Learning (CLIL) Course to Enhance English Language Abilities, Agricultural Content, and Cultural Knowledge of Undergraduate Students

Appendix G

Interview Questions on the Content and Language Integrated Learning (CLIL) Course to Enhance English Language Abilities, and Agricultural Content and Cultural Knowledge of Undergraduate Students

1. What are the course objectives? (If the interviewee cannot recall them, provide him/her the enclosure on the course objectives.)
2. Are the course objectives suitable? If not, which of them should be improved? In what ways?
3. Which of the five objectives do you like the most and the least? Why?
4. Do you think the course contents match the course objectives? If not, which should be improved? In what ways?
5. Do you think the course contents are suitable for the time allocated (6 hours per unit; two sessions per lesson; twelve sessions per course)? If not, in what ways should they be improved?
6. Do you think the course contents can improve your ability to work in agribusiness? If so, in what ways?
7. Do you think the teaching methods and activities of the CLIL course can improve your reading and writing abilities? If not, in what ways, should they be improved?
8. Do you think the teaching methods and activities of the CLIL course can promote learning the agricultural content and the cultural knowledge? If not, in what ways, should they be improved?
9. Do you think there is a wide range of teaching methods and activities of the CLIL course? If not, what should be included in the course?
10. Do you think working in pairs and in groups can promote learning in the CLIL course? What are the obstacles in working in pairs and in groups?
11. Do you think the instructional materials of each unit in general can promote practicing reading and writing? If not, in what ways, should they be improved?

12. Do you think the instructional materials of each unit in general can promote learning the agricultural content and the cultural knowledge? If not, in what ways, should they be improved?

13. Do you think the instructional materials are interesting? If not, in what ways, should they be improved?

14. Do you think the evaluation methods are suitable? If not, in what ways, should they be improved?

15. What are the strengths and weaknesses of the instructor?

16. What are the benefits of the course? What should be improved?



Appendix H
List of Experts Validating Research Instruments
and
Second Writing Rater

1. A Needs Analysis Questionnaire on English Language Skills (Reading and Writing Skills), Thinking Skills, Agricultural Content, and Cultural Knowledge of Agricultural Technology Students, and the Opinions about Development of the Content and Language Integrated Learning (CLIL) Course for Undergraduate Students)

1.1 Associate Professor Dr. Jirapa Vitayapirak, Ph.D.

King Mongkut's Institute of Technology Ladkrabang

1.2 Associate Professor Chamroon Laosinwattana, Ph.D.

King Mongkut's Institute of Technology Ladkrabang

1.3 Ajarn Sutthirak Sapsirin, Ph.D.

Chulalongkorn University

2. Needs Analysis Interview Questions on English Language Skills (Reading and Writing Skills), Thinking Skills, Agricultural Content, and Cultural Knowledge of Agricultural Technology Students, and the Opinions about Development of the Content and Language Integrated Learning (CLIL) Course for Undergraduate Students)

2.1 Associate Professor Dr. Jirapa Vitayapirak, Ph.D.

King Mongkut's Institute of Technology Ladkrabang

2.2 Associate Professor Chamroon Laosinwattana, Ph.D.

King Mongkut's Institute of Technology Ladkrabang

2.3 Ajarn Sutthirak Sapsirin, Ph.D.

Chulalongkorn University

3. The CLIL Course Lesson Plans and Worksheets

3.1 Associate Professor Somyot Detpiratmongkol Ph.D. (The

King Mongkut's Institute of Technology Ladkrabang

(The CLIL course lesson plan and worksheets of Unit 2)

3.2 Asst. Professor Teerawat Sarutyopart, Ph.D.

King Mongkut's Institute of Technology Ladkrabang

(The CLIL course lesson plan and worksheets of Unit 1)

3.3 Associate Professor Kan Suksupath, Ph.D.

King Mongkut's Institute of Technology Ladkrabang

(The CLIL course lesson plan and worksheets of Units 3, 4)

3.4 Assistant Professor Thamrong Mekhora, Ph.D

King Mongkut's Institute of Technology Ladkrabang

(The CLIL course lesson plan and worksheets of Units 5, 6)

3.5 Associate Professor Jirapa Vitayapirak, Ph.D.

King Mongkut's Institute of Technology Ladkrabang

3.6 Ajarn Sumanee Pinweha, Ph.D.

Thai Airways International Public Company Limited (Language and

Training Innovations Department)

3.7 Ajarn Pramarn Subphadoongchone, Ph.D.

Chulalongkorn University

4. The CLIL Test

4.1 Associate Professor Somyot Detpiratmongkol Ph.D. (The

King Mongkut's Institute of Technology Ladkrabang

(The CLIL test items relating to irrigation methods)

4.2 Associate Professor Kan Suksupath, Ph.D.

King Mongkut's Institute of Technology Ladkrabang

(The CLIL test items relating to site selection for poultry farms and poultry housing)

4.3 Assistant Professor Teerawat Sarutyopart, Ph.D.

King Mongkut's Institute of Technology Ladkrabang

(The CLIL test items relating to environmental factors that affect plant growth)

4.4 Assistant Professor Thamrong Mekhora, Ph.D

King Mongkut's Institute of Technology Ladkrabang

(The CLIL test items relating to marketing setting: e-marketing and the marketing mix)

4.5 Ajarn Sutthirak Sapsirin, Ph.D.

Chulalongkorn University

4.6 Ajarn Chatraporn Piamsai, Ph.D.

Chulalongkorn University

4.7 Ajarn Tanisaya Jiriyasin, Ph.D.

University of the Thai Chamber of Commerce

5. An Opinion Questionnaire Toward the Content and Language Integrated Learning (CLIL) Course to Enhance English Language Abilities, and Agricultural Content and Cultural Knowledge of Undergraduate Students

5.1 Ajarn Sutthirak Sapsirin, Ph.D.

Chulalongkorn University

5.2 Ajarn Chatraporn Piamsai, Ph.D.

Chulalongkorn University

5.3 Ajarn Sumanee Pinweha, Ph.D.

Thai Airways International Public Company Limited (Language and
Training Innovations Department)

6. Interview Questions on the Content and Language Integrated Learning (CLIL)
Course to Enhance English Language Abilities, and Agricultural Content and Cultural
Knowledge of Undergraduate Students

6.1 Ajarn Sutthirak Sapsirin, Ph.D.

Chulalongkorn University

6.2 Ajarn Chatraporn Piamsai, Ph.D.

Chulalongkorn University

6.3 Ajarn Sumanee Pinweha, Ph.D.

Thai Airways International Public Company Limited (Language and
Training Innovations Department)

7. Second Writing Rater

Ajarn Tanassanee Jitpanich

King Mongkut's Institute of Technology Ladkrabang

REFERENCES

- Admiraal, W., Westhoff, G., and de Bot, K. (2006). Evaluation of bilingual secondary education in the Netherlands: Students' language proficiency in English. *Educational Research and Evaluation*, 12(1), 75–93.
- Aebbersold, J. A., & Field, M. L. (1997). *From reader to reading teacher: Issues and strategies for second language classrooms*. Cambridge: Cambridge University Press.
- Alderson, J. C. (2000). *Assessing reading*. Cambridge: Cambridge University Press.
- Alejo, R., & Piquer, A. (2010). CLIL teacher training in Extremadura: A needs analysis perspective In Y. R. d. Z. a. D. Lasagabaster (Ed.), *CLIL in Spain: Implementation, results and teacher training*. Newcastle: Cambridge Scholars.
- Anderson, L. W., Krathwohl, D. R., & Bloom, B. S. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. New York: Longman.
- ASEAN Secretariat. (2008). Charter of the Association of Southeast Asian Nation. Retrieved from <http://www.asean.org/archive/publications/ASEAN-Charter.pdf> website:
- Bachman, L. S., & Palmer, A. S. (1996). *Language testing in practice: designing and developing useful language tests*. Oxford: Oxford University Press.
- Baker, W. (2008). A critical examination of ELT in Thailand: The role of cultural awareness. *RELC*, 39(1), 132-146.
- Bentley, K. (2010). *The TKT course CLIL module: Content and Language Integrated Learning*. Cambridge: Cambridge University Press.
- Bernstein, D. A. e. a. (2011). *Psychology* (9th ed.). Belmont: Wadsworth Publishing.
- Blasco, A. B. (2011). *Implementing CLIL in a primary school in Spain: The effects of CLIL on L2 English learners' oral production skills*. (MA Acquisition of English and Intercultural Communication), Universitat Autònoma de Barcelona. Retrieved from

<http://www.recercat.cat/bitstream/handle/2072/169743/Treball%20de%20recerca.pdf?sequence=1>

- Bloom, B. S. (1956). *Bloom's taxonomy of educational objectives: The classification of educational goals (Handbook1: Cognitive domain)*. New York: David McKay.
- Brown, H. D. (2001). *Teaching by principles: An interactive approach to language pedagogy*. New York: White Plains.
- Brown, H. D. (2004). *Language assessment: Principles and classroom practices*. New York: White Plains.
- Brown, H. D. (2007). *Principles of language learning and teaching*. New York, NY: Pearson Education.
- Burton, J. S., Sudweeks, R. R., Merrill, P. F., & Wood, B. (1991). How to prepare better multiple-choice test items: Guidelines for university faculty. [Online]. Brigham Young University. <https://testing.byu.edu/handbooks/betteritems.pdf>
- Chaisuriya, A. (2006). English reading needs and problems of graduate students of business. *Humanities and Social sciences Academic Journal*, 14(20), 84-105.
- Chostelidou, D., & Grivab, E. (2014). Measuring the effect of implementing CLIL in higher education: An experimental research project. *Social and Behavioral Sciences*, 116, 2169 – 2174.
- www.sciencedirect.com/science/article/pii/S1877042814005552
- Clegg, J. (2006). Education in English as a second language: A world of practices. In N. J. Wendy Arnold, Hans Mol, and Rosemary Mitchell-Schuitevoerder (Ed.). Canterbury IATEFL YL SIG.
- Cottrell, S. (2001). *Teaching study skills and supporting learning*. New York: Palgrave.
- Cottrell, S. (2005). *Critical thinking skills: Developing effective analysis and argument*. New York: Palgrave.
- Coyle, D., Hood, P., & Marsh, D. (2010). *CLIL: Content and Language Integrated Learning*. Cambridge: Cambridge University Press.
- Dalton-Puffer, C. (2007). Outcomes and processes in Content and Language Integrated Learning (CLIL): current research from Europe.
- http://www.ecml.at/mtp2/CLILmatrix/html/CLIL_E_news.htm#milestones
- Darn, S. (2006). CLIL: A European overview. <http://www.eric.ed.gov/#ED490775>

- Dudley-Evans, T., & St John, M. J. (1998). *Developments in English for Specific Purposes: A multi-disciplinary approach*. Cambridge: Cambridge University Press.
- Educational Testing Service. (2011). Test and Score Data Summary for TOEFL Internet-based and Paper-based Tests: January 2010—December 2010 Test Data. <http://www.ets.org/Media/Research/pdf/TOEFL-SUM-2010.pdf>
- European Commission. (2012). Content and language integrated learning. http://ec.europa.eu/languages/language-teaching/content-and-language-integrated-learning_en.htm
- Eurydice. (2006). *Content and Language Integrated Learning (CLIL) at School in Europe*. Retrieved from http://www.indire.it/lucabas/lkmw_file/eurydice/CLIL_EN.pdf
- Fahim, M., & Sa'eepour, M. (2011). The impact of teaching critical thinking skills on reading comprehension of Iranian EFL learners. *Journal of Language Teaching and Research*, 2(4), 867-874.
- Fernandez, D. J. (2009). CLIL at the university level: Relating language teaching with and through content teaching. *Latin American Journal of Content & Language Integrated Learning*, 2(2), 10-26.
- Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication*, 32(4), 365-387.
- Gil, N. N. (2012). *Motivation and content language integrated learning: An impulse for second language leaning*. (Master's Degree), Universitat de Barcelona.
- Grabe, W. (2009). *Reading in a second language: Moving from theory to practice*. Cambridge: Cambridge University Press.
- Graves, K. (2000). *Designing language courses: A guide for teachers*. Ontario: Heinle & Heinle.
- Gupta, I. C., & Gupta, S. K. (2002). *Concepts' dictionary of agricultural sciences*. New Delhi: Concept Publishing Company.
- Harmer, J. (1998). *How to teach English: An introduction to the practice of English language teachin*. Harlow: Longman.
- Harmer, J. (2004). *Understanding reading development*. Gateshead: Atheneum Press.

- Harrison, C. (2004). *Understanding reading development*. Gateshead Athenaeum Press.
- Hyland, K. (2002). *Teaching and researching writing*. London: Pearson Education.
- Irwin, J. W. (2007). *Teaching reading comprehension processes* (3rd ed.). Boston: Pearson.
- Islam, S. M. R. (2015). What are the importance and benefits of "critical thinking skills"? <https://www.linkedin.com/pulse/what-importance-benefits-critical-thinking-skills-islam>
- Jacobs, H. L. (1981). *Testing ESL composition: A practical approach*. Rowley, Mass: Newbury House.
- Jenkins, J. (2005). *World Englishes*. New York: Routledge.
- King, F. J., Goodson, L., & Rohani, F. (1998). Higher order thinking skills: Definitions, strategies, assessment.
http://www.cala.fsu.edu/files/higher_order_thinking_skills.pdf
- Kirkpatrick, A. (2010). English as an Asian lingua franca and the multilingual model of ELT. *Language Teaching*, 44(2), 1-13. doi:
<http://dx.doi.org/10.1017/S0261444810000145>
- Krashen, S. D. (2004). *The power of reading: Insights from the research* (2nd ed.). Portsmouth: Heinemann. กรมมหาวิทยาลัย
- Krattitong, C. (2009). *A development Thai language additional course based on standards-based curriculum using backwards design process to enhance analyzing and analytical reading abilities of lower secondary students*. (Doctoral Degree), Chulalongkorn Univeristy.
- Lara Garridio, M. F. (n.d.). CLIL: A new approach to TEFL.
http://assets00.grou.ps/0F2E3C/wysiwyg_files/FilesModule/bep_network/2010_1007140355-gbrwfopegcijlzm/NA-assignment.pdf
- Lasagabaster, D. (2008). Foreign language competence in Content and Language Integrated Courses. *The Open Applied Linguistics Journal*, 1, 31-42.
- Marsh, D. (2002). CLIL – Content and Language Integrated Learning EMILE – Enseignement d'une Matière par l'Intégration d'une Langue Etrangère: The

European dimension: Actions, trends and foresight Potential.

http://ec.europa.eu/languages/documents/clil-marsh_en.pdf

Matsuda, P. K. (2003). Second language writing in the twentieth century. In B. Kroll (Ed.), *Exploring the dynamics of second language writing*. Cambridge: Cambridge University Press.

Moran, P. R. (2001). *Teaching culture: Perspectives in practice*. Boston: Heinle, Cengage Learning.

Morin, A. (2013). What are cognitive skills? A definition of cognitive skills.

<http://childparenting.about.com/od/schoollearning/a/cognitive-skills-def.htm>

Moseley, D., Baumfield, V., Elliot, J., Gregson, M., Higgins, S., Miller, J., & Newton, D. P. (2005). *Frameworks for thinking: A handbook for teachers and learning*. Cambridge: Cambridge University Press.

Myles, J. (2002). Second language writing and research: The writing process and error analysis in student texts. *TESL-EJ*, 6(2).

Office of Higher Education Commission. (2012). Thai Higher Education: Policy & issue. <http://inter.mua.go.th/main2/files/file/Policy&Issue/OHEC%20Policy&IssueThai%20Higher%20Education%20PolicyIssue.pdf>

Olson, C. B. (2003). *The reading/writing connection*. Boston: Pearson Education.

Orr, T. (2002). *English for specific purposes*. Alexandria, VA: TESOL.

Oxford Dictionaries. Retrieved June 24, 2016, from www.oxforddictionaries.com/definition/english/undergraduate

Papaja, K. (2012). The impact of students' attitude on CLIL: A study conducted in higher education. *Latin American Journal of Content and Language Integrated Learning*, 5(2), 28-56. doi: 10.5294/laclil.2012.5.2.10. ISSN 2011-6721

Paris, S. G., Wasik, B. A., & Turner, J. C. (1991). The development of strategic readers. In M. L. K. R. Barr, P. B. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research* (Vol. 2, pp. 609-640).

Pawapatcharodom, R. (2007). *An investigation of Thai students' English language problems and their learning strategies in the international program at Mahidol University*. (Master of Arts), King Mongkut's Institute of Technology North Bangkok.

- Phoodokmai, B. (2011). *Development of an English for Academic Purposes course using Content and Language Integrated Learning Approach to enhance reading and writing skills of undergraduate students* (Master's Degree), Chulalongkorn University. Retrieved from <http://cuir.car.chula.ac.th/handle/123456789/33927>
- Pokrivcaková, S., Menzlová, B., & Farkašová, E. (2010). Creating conditions for effective application of CLIL methodology in Slovakia. In S. P. e. al. (Ed.), *Modernization of teaching foreign languages: CLIL, inclusive and intercultural education* (pp. 7-20).
- Prapphal, K., & Opanon-Amata, P. (2002). An investigation of English proficiency of Thai graduates. *Chulavijai*, 21(3), 12-16.
- Richards, J. C. (2007). *Curriculum development in language teaching* (8th ed.). Cambridge: Cambridge University Press.
- Richards, J. C., & Rodgers, T. S. (2003). *Approaches and methods in language teaching* (2nd ed.). Cambridge: Cambridge University Press.
- Ruiz-Garrido, M. F., & Fortanet-Gómez, I. (2015). Needs analysis in a CLIL context: A transfer from ESP. *CLIL Practice: Perspectives from the Field*(January), 179-188.
- Sainsbury, M. (2009). Developing writing in a high-stakes environment. In J. R. Roger Read, Debra Myhill, and Martin Nystrand (Ed.), *The sage handwriting development*. London: Sage Publications.
- Silva, T. (1997). Second language composition instruction. In B. Kroll (Ed.), *Second language writing: Research insights for the classroom*. Cambridge: Cambridge University Press.
- Simões, A. R., et al. (2013). The Project English Plus: a CLIL approach in a Portuguese school. *ID*, 5(4), 31-51.
- Soulioti, E. V. (2014). Implementing CLIL in a tertiary setting: Research on learners' attitudes and perceptions. In N. L. e. al. (Ed.), *Major trends in theoretical and applied linguistics 3: Selected papers from the 20th ISTAL*. London: Versita.

- Sudhoff, J. (2010). CLIL and intercultural communicative competence: Foundations and approaches towards a fusion. *International CLIL Research Journal*, 1(3), 30-37.
- Suhor, C. (1984). Thinking skills in English—and across the curriculum. <http://www.ericdigests.org/pre-921/english.htm>
- Suwannoppharat, K. (2014). *A development of a Content and Language Integrated Learning course to enhance cultural awareness and English communication ability of Thai undergraduates in the international program* (Doctoral Degree), Chulalongkorn University. Retrieved from <http://cuir.car.chula.ac.th/handle/123456789/46509>
- Tai, H. Y. (2015). Writing development in syntactic complexity, accuracy and fluency in a content and language integrated learning class. *International Journal of Language and Linguistics*, 2(3), 149-156.
- Tardieu, C. (2012). Integrating the task-based approach to CLIL teaching.
- The CLIL Compendium. (2001). from <http://www.clilcompendium.com/clilcompendium.htm>
- University of Cambridge ESOL Examinations. (2009). *Teaching knowledge test: Content and Language Integrated Learning Glossary* Retrieved from http://www.google.co.th/url?sa=t&rct=j&q=university%20of%20cambridge%20esol%20examinations%202009%20clil&source=webe&cd=2&cad=rja&ved=0C DUOfjAB&url=http%3A%2F%2Fwww.cambridgeenglish.org%2Fimages%2F22194-tkt-clil-glossary.pdf&ei=-EtyUa-LM4yIraFj_4HgBw&usq=AFOjCNFEPqcdY85CANytY6WrBBm55cLt0A&bvm=bv.45512109.d.bmk
- Värkuti, A. (2010). Linguistic benefits of the CLIL approach: Measuring Linguistic Competences. *International CLIL Research Journal*, 1(3), 67-79.
- Weigle, S. C. (2002). *Assessing writing*. Cambridge: Cambridge University Press.
- Wiwczaroski, T. B. (2009). Resistances and barriers to the introduction of CLIL courses. *ESP World*, 5(8), 1-6.

- Wolff, D. (2010). Developing curricula for CLIL: Issues and problems. In B. a. C. O'Rourke, L. (Ed.), *Language learner autonomy: Policy, curriculum, classroom: A Festschrift in Honour of David Little*.
- Wongsothorn, A. (1993). *Levels of English skills of Thai university students*. Language Institute: Chulalongkorn University Press.
- Yamane, T. (1973). *Statistics: An introductory analysis* (3rd ed.). New York: Harper and Row.
- Yamano, Y. (2013). CLIL in a Japanese primary school: Exploring the potential of CLIL in a Japanese EFL context. *International CLIL Research Journal*, 2(1), 19-30.
- บุญเชิด ภิญญอนันต์พงศ์. (2526). การทดสอบแบบอิงเกณฑ์แนวคิดและวิธีการ. กรุงเทพมหานคร มหาวิทยาลัยศรีนครินทรวิโรฒ.
- ประคอง กรรณสูต. (2535). สถิติเพื่อการวิจัยทางพฤติกรรมศาสตร์. กรุงเทพมหานคร มหาวิทยาลัยศรีนครินทรวิโรฒ.
- ศิริชัย กาญจนวาสี. (2548). ทฤษฎีการทดสอบแบบดั้งเดิม กรุงเทพมหานคร โรงพิมพ์แห่งจุฬาลงกรณ์มหาวิทยาลัย.
- สาขาวิชาศิลปศาสตร์ประยุกต์. (2554). รายงานฉบับสมบูรณ์: ใบแสดงเกรดของนักศึกษาคณะเทคโนโลยีการเกษตรวิชาภาษาอังกฤษพื้นฐาน 1 คณะครุศาสตร์อุตสาหกรรม. กรุงเทพมหานคร: สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง.
- สาขาวิชาศิลปศาสตร์ประยุกต์. (2555a). รายงานฉบับสมบูรณ์: ใบแสดงเกรดของนักศึกษาคณะเทคโนโลยีการเกษตรวิชาภาษาอังกฤษเชิงวิชาการ คณะครุศาสตร์อุตสาหกรรม. . กรุงเทพมหานคร: สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง.
- สาขาวิชาศิลปศาสตร์ประยุกต์. (2555b). รายงานฉบับสมบูรณ์: ใบแสดงเกรดของนักศึกษาคณะเทคโนโลยีการเกษตรวิชาภาษาอังกฤษพื้นฐาน 2 คณะครุศาสตร์อุตสาหกรรม. กรุงเทพมหานคร: สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง.
- สุพัฒน์ สุขมลสันต์. (2548). การวิเคราะห์ข้อสอบแบบอัตนัยรายข้อ. กรุงเทพมหานคร โรงพิมพ์แห่งจุฬาลงกรณ์มหาวิทยาลัย.

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