# Exploring English Reading and Writing Needs of Undergraduate Science Students: A Case Study in Thailand

Charinee Chansri

Department of Languages, Faculty of Liberal Arts, King Mongkut's Institute of Technology Ladkrabang, Bangkok 10520, Thailand
Corresponding author. E-Mail address: charinee.ch@kmitl.ac.th
Received: 26 November 2019; Revised: 29 February 2020; Accepted: 13 March 2020

**Abstract**

This paper aims to investigate English Reading and Writing Needs of Undergraduate Science Students at King Mongkut's Institute of Technology Ladkrabang, Thailand. The data were collected from both 100 first-year to fourth-year Science students and ten ESP teachers. An English reading and writing needs questionnaire as well as an interview protocol were developed to collect the data from the student participants, while an interview protocol was utilized to explore the ESP teacher participants' perceptions. The data gained from the questionnaire were analyzed by means of descriptive statistics, namely, percentage, mean, and standard deviation, and those obtained from the interviews were analyzed by using the content analysis. In terms of reading, the results of the study revealed that 'reading assigned textbooks and course handouts' was considered a very important sub-skill, whereas, as for writing, 'writing assignments and homework' and 'writing answers to exam questions' were viewed as the most important writing sub-skills. Regarding Science students' in English reading and writing in the scientific context, the findings in the realm of reading showed that 'skimming the text for main ideas' was the most important problems among Science students, while, as for writing, 'using language correctly and appropriately' was found as the most problematic sub-skill. The pedagogical implications of the study help suggest some fruitful avenues for English language teachers who are interested in developing an English reading and writing course for Science students.

**Keywords:** English Reading and Writing Needs, English Reading and Writing Problems, Science Students

## Introduction

In spite the Thai government's efforts to develop students' English language skills required by the international marketplace, Thai students in every level of education, including in higher education, have encountered difficulties in many aspects of English language, particularly in reading and writing. Adchariyaprasit (2014) has reported on problems in English reading of 58 Thai students, which involved lack in skimming and scanning reading, inability to summarize what they read, inability to analyze and synthesize, and inability to criticize literary works. Moreover, Rodsawang (2017) has also found that 27 Thai students had English writing problems in various aspects, namely, grammar uses, lexical issues, writing styles, and practicing hours.

Similarly, King Mongkut's Institute of Technology Ladkrabang, KMITL, Science students failed to be proficient in English reading and writing despite the fact that they were required to enroll in two English foundation courses: Foundation English 1 and Foundation English 2. That is, the average mean score of the academic year 1/2017 in the Development of Reading and Writing in English course was 2.55 (Department of Languages, 2017). Needless to say, such a score cannot be considered satisfactory.

In order to help Science students in the Development of Reading and Writing in English course overcome such difficulties, conducting needs analysis, is an initial significant step. As Munby (1978) suggested, needs analysis or needs assessment is required in the first place in developing a course. This is because it is a process of collecting information as a basis to design a course that suits the needs of a particular group of learners (Iwai et al., 1999; Graves, 2000). Needs analysis provides in what way a course should be (Dudley-Evans & St. John, 1998), makes the course encompassed with relevant activities (Johns, 1991), and suggests the evaluation to prove the

effectiveness of the course (Dudley-Evans & St. John, 1998). To understand the terms 'needs' is one of the primary steps to conduct needs analysis. Richards (2007) has stated that needs' or language needs are often used to refer to learners' linguistic deficiency which shows the difference between what learners can do and what they should be able to do in a language situation. Based on the definition, the terms 'needs' may be used to cover a wide range of meanings. The first pair is felt and perceived. Felt needs involves the needs which learners have, while perceived needs is associated with judgments of experts about lacks of other people (Berwick, 1989). The second pair is subjective and objective (Brindley, 1989). One aims to gain factual details for setting goals concerning language content, while the other aims to collect the data about learners which will be used as a guideline for their learning process.Yet, the two views are aimed to yield an appropriate amount of input, which Krashen (1982) has pointed out in his *Input Hypothesis* as one of the keys to effective teaching. According to the hypothesis, learners need teaching language as well as teaching materials that are proper to their understanding. Thus, if the learners receive too complicated language or instruction, which do not suit their needs, this will impede their language learning. That is why both pairs of needs should be simultaneously taken into considerations

The different views on needs as previously mentioned help form different approaches to needs analysis. Dudley-Evans and St. John have proposed three approaches: Target Situation Analysis (TSA), Learning Situation Analysis (LSA), and Present Situation Analysis (PSA).

Target Situation Analysis (TSA), based on based on Munby's (1978) model of the Communication Needs Process, aims to analyze language communication that occurs in the target situation to gain a profile of communicative needs for a particular group of learners. As factual information on the needs perceived by the outsiders, such as teachers and prospective employers, has to be gathered, TSA corresponds with the perceived and objective needs. On the other hand, Learning Situation Analysis (LSA) focuses on compiling the information of language skills learners need in a specified target situation. Since the highlight of the approach is on how learners prefer to learn (Mohammadi & Mousavi, 2013), LSA corresponds with the felt and subjective needs. Apart from the two approaches, as a complement to TSA (Robinson, 1991; Jordan, 1997), Present Situation Analysis (PSA) has been devised to estimate "strengths and weaknesses in language, skills, learning experiences" (Dudley-Evans & St. John, 1998, p. 125). As a result, PSA can serve as a starting point to gain learners' needs in a target situation.

With respect to needs analysis and needs analysis approaches as mentioned above, needs analysis has been conducted in various contexts and in various fields of study, including science, to help facilitate course design at a university level. For example, Rahman (2012) has explored the English language needs of 55 undergraduate computer science students at a university in Malaysia. The results revealed that the students' most problematic reading sub-skills were skimming for gist, scanning, and decoding meaning. With the focus on students' wants rather than their difficulties, Alastal & Shuib (2012) surveyed the perceptions of 180 applied science students at a Malaysian university about the academic English language skills needed for their academic study. The results showed that the students believe that the most important English reading sub-skill was reading textbooks. This is followed by reading to understand test and exam questions, reading reference books, reading texts from the Internet, and reading professional journals. It was also found that the students viewed writing correct sentences the most important English writing sub-skill. Likewise, focusing on the students' perceptions regarding their English language skills needed as Fadel & Rajab (2017) has investigated the English reading and writing needs of 135 female undergraduate computer science students in the Saudi Arabian context. The results in terms of reading sub-skills showed that most of the students considered reading electronic study notes and texts as the most frequently

used, followed by reading assigned textbooks and course handouts, reading technical articles and journals, and reading technical manuals. As for writing sub-skills, the majority of the students agreed that writing projects and assignments the most frequently used, followed by writing exam answers, writing proposals, and writing notes in lectures.

Such significance of needs analysis can thus be seen in the research studies mentioned earlier as a good basis for appropriate course design. This has brought about the researcher's interest in exploring Science students' needs of English reading and writing in order to develop a reading and writing course for undergraduate science students in Thailand. The study was conducted based on the conceptual framework as follows:

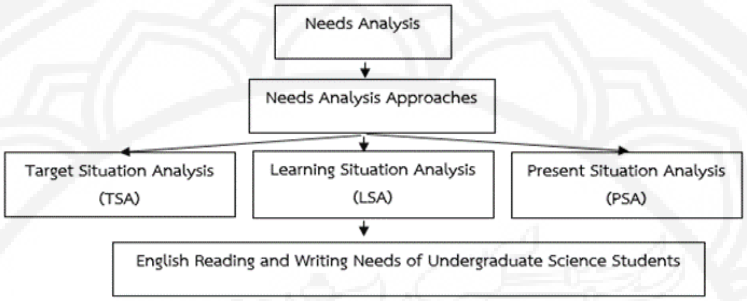


**Figure 1** Conceptual Framework of the Study

The needs analysis was conducted on the basis of three needs analysis approaches, namely, 1) Target Situation Analysis (TSA) – aimed to gain targeted English reading and writing needs of Science students from the perspective of the outsider, which included ESP instructors in the present study, 2) Learning Situation Analysis (LSA) – focused on the targeted English reading and writing needs of Science students from the perspective of the perspective of the Science students themselves, and 3) Present Situation Analysis (PSA) – specified to obtain data on difficulties the Science students faced when reading and writing in English from the perspectives of the Science students as well as that of ESP instructors.

## Methods and Materials

The present study is survey research, and it was aimed to obtain English reading and writing needs of undergraduate Science students from the views of undergraduate Science students and English for Specific Purposes (ESP) instructors. The participants of the study consisted of two groups of individuals, who were undergraduate students at the Faculty of Science and ESP instructors, at KMITL, Bangkok, Thailand.

The first group of participants was undergraduate students from the Faculty of Science. The sample size was 100 first- to fourth-year undergraduate students at the Faculty of Science at KMITL. They were recruited to complete a needs questionnaire by means of a voluntary basis, and Yamane's sample size table with ±10% variance (Yamane, 1973) was employed to determine the sample size. The population consisted of 4,484 first- to fourth-year undergraduate Agricultural students (investigated by Office of Registrar of KMITL, on March 3, 2017). According to Yamane's sample size table, the appropriate sample size should be at least 96. The participants included were both males and females with their ages between 18 and 21 years old, and their native language was Thai. Besides, ten undergraduate Science students were recruited on a voluntary basis to participate in the interviews aimed to gain in-depth information.

The second group of participants was ESP instructors. Ten English language instructors at the Faculty of Liberal Arts at KMITL, who had had experience teaching undergraduate Science students were recruited by using the purposive sampling technique. All ten ESP instructor participants were asked to participate in the interviews aimed to gain in-depth information on the English reading and writing needs of undergraduate Science students.

The three research instruments used in conducting the needs analysis included 1) A Needs Analysis Questionnaire on English Reading and Writing Skills, 2) an interview protocol for Science students, and 3) an interview protocol for ESP instructors. First, the questionnaire was developed by the researcher based on the reading and writing sub-skills as mentioned in the two research studies, the one conducted by Fadel & Rajab (2017) and another one conducted by Alastal & Shuib (2012), as well as on the reading and writing difficulties pointed out in a study conducted by Rahman (2012). It contained three parts: Part A eliciting the data regarding the science student participants' demographic information and their English reading and writing abilities; Part B including the items eliciting the English reading and writing sub-skills needed in the scientific context; and Part C being focused on Science students' English reading and writing problems. The levels of importance as well as those of problems were measured by a five-point Likert scale (Likert, 1932). Apart from the questionnaire, the semi-structure interview protocols were designed in order to collect the in-depth information on the needs for Science students' English reading and writing from both Science students and ESP instructors. Besides, the content validity of both the questionnaire and the interview protocols was examined by three experts, two in the field of ESP teaching and one in the field of language assessment and evaluation. The questionnaires and the interview protocols were then reviewed and revised according to the experts' comments and suggestions.

The questionnaire was distributed to the student participants, namely, 100 undergraduate students from the Faculty of Science. Then, the interviews were conducted with ten undergraduate students from the Faculty of Science and ten ESP instructors, by the researcher as an interviewer. Then, the data from the questionnaire were analyzed by means of descriptive statistics: percentage, mean, standard deviation, while the data collected from the interviews were analyzed by using content analysis. After the data from the audio recording were transcribed and categorized according to the interview questions, the similarities and differences of the responses were then tallied, grouped, and reported.

## Results

### 1. Science Student Participants' Demographic Information and English Reading and Writing Abilities

**Table 1** Demographic Information

| Demographic Information | Number (N = 100) | Percentage (%) |
|---|---|---|
| **Gender** | | |
| Male | 38 | 38.000 |
| Female | 62 | 62.000 |
| **Age** | | |
| 18 years old | 12 | 12.000 |
| 19 years old | 19 | 19.000 |
| 20 years old | 28 | 28.000 |
| 21 years old | 26 | 26.000 |
| 22 years old | 15 | 15.000 |

**Table 1** (Cont.)

| Demographic Information | Number (N = 100) | | Percentage (%) |
|---|---|---|---|
| **Year of Study** | | | |
| 1 | 25 | | 25.000 |
| 2 | 25 | | 25.000 |
| 3 | 25 | | 25.000 |
| 4 | 25 | | 25.000 |
| **Major** | | | |
| Industrial Microbiology | 12 | | 12.000 |
| Applied Mathematic | 14 | | 14.000 |
| Environmental Resource Chemistry | 2 | | 2.000 |
| Biotechnology | 5 | | 5.000 |
| Applied Statistics | 4 | | 4.000 |
| Industrial Chemistry | 15 | | 15.000 |
| Applied Physics | 20 | | 20.000 |
| **English Reading and Writing Abilities** | **Mean** | **S.D.** | **Interpretation** |
| English Reading Ability | 3.240 | 0.754 | Moderate |
| English Writing Ability | 2.750 | 0.770 | Moderate |

According to Table 1, the student participants of the study, were the first-, second-, third- and, fourth-year undergraduate Science students, and they were studying in the first semester of the academic year 2017. Of the 100 participants, 62 were female (62%), while 38 were male (38%), and most of them (28%), were 20 years old. They were from Applied Physics (20%), Applied Mathematic (14%), Industrial Microbiology (12%), Environmental Resource Chemistry (12%), Biotechnology (5%), Industrial Chemistry (5%), and Applied Statistics (4%). The participants considered their English reading and writing abilities in the moderate level (3.240 and 2.750, respectively).

### 2. English Reading Sub-Skills Needed in the Scientific Context

**Table 2** English Reading Sub-Skills Needed in the Scientific Context

| English Reading Sub-Skills Needed in the Scientific Context | Mean | S.D. | Interpretation |
|---|---|---|---|
| 1. Reading assigned textbooks and course handouts | 4.250 | 0.892 | Very important |
| 2. Reading study notes and texts in science | 4.070 | 0.935 | Important |
| 3. Reading research reports | 3.910 | 1.248 | Important |
| 4. Reading technical manuals | 3.870 | 1.125 | Important |
| 5. Reading technical journal articles | 3.750 | 1.077 | Important |
| 6. Reading lab reports | 3.730 | 1.145 | Important |
| 7. Reading memos | 3.670 | 0.975 | Important |
| 8. Reading newspaper articles | 3.510 | 0.870 | Important |
| 9. Reading magazine articles | 3.470 | 0.915 | Important |
| 10. Reading government bulletins | 3.310 | 1.125 | Important |

Table 2 shows that, overall, the participants considered all the English reading sub-skills in the scientific context were significant (Mean = 3.754, S.D.= 0.788). Among the ten English reading sub-skills, 'reading assigned textbooks and course handouts' was viewed as a very important sub-skill. Other prominent English

reading sub-skills which were claimed important were 'reading study notes and texts in science' (Mean = 4.070, S.D.= 0.935) and 'reading research reports' (Mean = 3.910, S.D.= 1.248).

Such results correspond with the data obtained from the interviews. That is all ten student interviewees and all ten teacher interviewees agreed that 'reading assigned textbooks and course handouts' was the most important reading activity for Science students since it was the key to the comprehension of the course contents, as can be seen in the following excerpt:

*In the scientific context, 'reading assigned textbooks and course handouts' is the most important skill because it is a skill used to comprehend PPT slides and readings suggested by the instructor.* (Students 1)

### 3. English Writing Sub-Skills Needed in the Scientific Context

**Table 3** English Writing Sub-Skills Needed in the Scientific Context

| English Writing Sub-Skills Needed in the Scientific Context | Mean | S.D. | Interpretation |
|---|---|---|---|
| 1. Writing assignments and homework | 4.010 | 0.870 | Important |
| 2. Writing a summary | 3.960 | 0.875 | Important |
| 3. Writing answers to exam questions | 3.960 | 0.953 | Important |
| 4. Writing proposals | 3.930 | 1.217 | Important |
| 5. Writing an abstract | 3.880 | 1.066 | Important |
| 6. Writing notes in lectures | 3.820 | 0.968 | Important |
| 7. Writing lab reports | 3.810 | 1.308 | Important |
| 8. Writing technical manuals | 3.740 | 1.151 | Important |
| 9. Writing research reports | 3.630 | 1.169 | Important |
| 10. Writing memos | 3.540 | 0.979 | Important |
| **Total** | **3.828** | **0.881** | **Important** |

According to Table 3, overall, English writing sub-skills in the scientific context were considered important (Mean = 3.828, S.D.= 0.881). Among the ten English writing sub-skills, the three prominent skills which were claimed important were 'writing assignments and homework' (Mean = 4.010, S.D.= 0.870), 'writing answers to exam questions' (Mean = 3.960, S.D.= 0.953), 'writing a summary' (Mean = 3.960, S.D.= 0.875), and 'writing proposals' (Mean = 3.930, S.D.= 1.217).

Such quantitative data concur with the qualitative data from the interviews. That is to say, four out of ten student interviewees agreed that 'writing answers to exam questions' was the most important writing activity in the scientific context since it was very useful when they had to accomplish the quizzes as well as exams included in the course as illustrated in the following excerpt:

*I think 'writing answers to exam questions' is essential for studying in the scientific context. For instance, in the General Chemistry course, the students had to write the answers in English to the questions in the quizzes and the exams.* (Student 2)

Besides, from the view of the ESP teachers, four out of ten claimed that 'writing assignments and homework' was the most important writing skill as it was vital for accomplishing tasks required in ESP courses:

*In my opinion, 'writing assignments and homework' is very important in going through an ESP course. For example, in the English for Business Course, several tasks, such as producing business emails and memos need writing skills.* (Teacher 4)

### 4. Problems in English Reading in the Scientific Context

**Table 4** Problems in English Reading in the Scientific Context

| Problems in English Reading in the Scientific Context | Mean | S.D. | Interpretation |
|---|---|---|---|
| 1. Skimming the text for main ideas | 4.080 | 1.012 | Important |
| 2. Identifying the author's purpose | 3.800 | 1.181 | Important |
| 3. Scanning the text for specific information | 3.790 | 0.998 | Important |
| 4. Making an inference | 3.730 | 1.043 | Important |
| 5. Guessing meaning from context | 3.720 | 1.055 | Important |
| 6. Making a reference | 3.550 | 1.009 | Important |
| **Total** | **3.778** | **0.894** | **Important** |

Table 4 shows that, overall, the student participants viewed problems in English reading in the scientific context as an important problem (Mean = 3.778, S.D.= 0.894). Out of the six problems, the two prominent problems were 'skimming the text for main ideas' (Mean = 4.080, S.D.= 1.012), and 'identifying the author's purpose' (Mean = 3.800, S.D.= 1.181).

The obtained data regarding the reading problem in 'skimming the text for main ideas' accords with those gained from student interviewees. To be specific, eight out of ten agreed that such a problem was the most significant in the area of writing because it was the basis for comprehending other details, as can be seen in the following excerpt:

*I do not have a good basis in reading, and when I cannot find the main idea of the reading passage, I cannot understand other specific information in it.* (Student 1)

To solve this problem, several students claimed that practicing skimming the main idea from a reading passage in Thai and was probably the solution. However, from the perspective of the teacher interviewees (four out of ten), 'guessing meaning from context' was the most problematic for reading since vocabulary played a vital role for readers' comprehension, particularly, when it came to scientific texts which highly contained the technical terms:

*I think knowing how to guess the meaning of a new word from the context is the most serious problem for writing. This is because vocabulary is the most important factor for comprehending a passage, especially, a scientific passage which contains a lot of technical terms.* (Teacher 3)

To overcome such a difficulty, helping students familiar with context clues was the key. That is, focusing on such devices such as definition clues and antonym clues could make them effectively guess the meaning of an unknown word.

### 5. Problems in English Writing in the Scientific Context

**Table 5** Problems in English Writing in the Scientific Context

| Problems in English Writing in the Scientific Context | Mean | S.D. | Interpretation |
|---|---|---|---|
| 1. Expressing content | 4.060 | 1.013 | Important |
| 2. Using language correctly and appropriately | 3.990 | 1.105 | Important |
| 3. Making an organization | 3.950 | 1.029 | Important |
| 4. Selecting appropriate vocabulary and idioms | 3.670 | 1.101 | Important |
| 5. Spelling | 3.590 | 1.190 | Important |

**Table 5** (Cont.)

| Problems in English Writing in the Scientific Context | Mean | S.D. | Interpretation |
|---|---|---|---|
| 6. Punctuation | 3.280 | 1.120 | Quite Important |
| 7. capitalization | 3.270 | 1.270 | Quite Important |
| **Total** | **3.687** | **0.862** | **Important** |

According to Table 5, the student participants viewed problems in English writing in the scientific context as an important problem (Mean = 3.687, S.D.= 0.862). Among the seven problems, the three prominent problems included 'expressing content (Mean = 4.060, S.D.= 1.013), 'using language correctly and appropriately' (Mean = 3.990, S.D.= 1.105), and 'making an organization' (Mean = 3.950, S.D.= 1.029).

Likewise, the majority of both the student interviewees and the teacher interviewees, six out of ten and five out of ten, respectively, agreed that 'using language correctly and appropriately' was the most problematic because it played an important part in expressing the content:

*Most Science students lack sufficient knowledge of English grammar, such as tenses and structures, which is an essential for conveying their ideas when writing. Thus, they usually face failure when they have to write although they have very good ideas.* (Student 5)

To solve this problem, both the student interviewees and the teacher interviewees claimed that practicing in terms of language use had to be emphasized alongside with obtaining the feedback from the instructor, as illustrated from the excerpt:

*Empowering students with language use capability is very important. The teacher must provide practice of a grammatical aspect related to an assignment. Besides, giving students proper feedback is essential for a teacher.* (Teacher 4)

## Discussion

As for English skills needed in the scientific context, as can be seen from the findings, Science students considered 'reading assigned textbooks and course handouts' a very important sub-skill. This corresponds with what Alastal & Shuib (2012) has found that reading textbooks was the most important English reading sub-skill for the academic study of applied science students at a Malaysian university. Similarly, such findings were in line with those in a study conducted by Fadel & Rajab (2017). The findings in such research showed that, apart from reading electronic study notes and texts, reading assigned textbooks and course handouts was agreed as a very important reading skill for undergraduate computer science students in the Saudi Arabian context. The results in the present study show the students' need on the genre of reading in their field of study, and this reflects the significance of *'the comprehensible input'* in instruction as Krashen (1982) mentions. That is to say, material selection which matches the students' understanding could lead to successful learning. Apart from this, such a need may have aligned with Krashen's *'the Affective Filter hypothesis'*, which highlights the role of affective factors such as motivation as a facilitative key in learning. To illustrate, reading texts which are in their interest could raise their affective filter that can help equip their learning.

As for writing, the findings revealed that 'writing assignments and homework' and 'writing answers to exam questions' were viewed as the most important writing sub-skills. The findings concur with those in a research study done by Alastal & Shuib (2012). According to the study, besides writing correct sentences, applied science students at a Malaysian university claimed writing test and exam answers as the most important English writing

sub-skill for them. This portrays how practicality is significant when it comes to designing materials for an ESP reading and writing course in which learners' special needs are the focus. That is, students should be trained to be familiar with texts in a scientific field as well as to be able to create a piece of writing as their assignment which can range from a short answer to a report containing several paragraphs. Moreover, the result of the present study once again shows the importance of *'the comprehensible input'* as well as that of the affective factors such as motivation, as explained by Krashen (1982) in the Input hypothesis and *'the Affective Filter hypothesis'*, respectively.

Regarding problems in English reading and writing in the scientific context, as for reading, the findings showed that 'skimming the text for main ideas' was the most important problems among Science students. This corresponds with what Rahman (2012) has found. That is, the results revealed that skimming for gist was most problematic reading sub-skills for undergraduate computer science students at a university in Malaysia. In terms of writing, 'using language correctly and appropriately' was found as the most problematic sub-skill for Science students. Alastal & Shuib (2012) surveyed the perceptions of applied science students at a Malaysian university about the academic English language skills needed for their academic study, and the findings revealed that the students viewed writing correct sentences the most important English writing sub-skill. The problems in the two areas suggest that Science students at KMITL are still lacking some fundamental skills in both reading and writing. That is to say, they need to be well-equipped with reading skills for finding main ideas as a good basis of reading various genres in their field such as textbooks, course handouts, and technical journal articles, alongside with the practice in higher order reading skills such as critical reading. Besides, to make Science students able to write effective assignments which can come in a variety of forms, grammatical knowledge is a key. This can make them convey their ideas efficiently as they expect.

## Conclusion and Suggestions

In conclusion, with regard to English skills needed for Science students, as reflected from both the quantitative and qualitative results, skills in reading assigned textbooks as well as those in writing assignments and homework were viewed as the most important sub-skills in reading and writing, respectively. It can be clearly seen that the practicality plays an important part in developing an ESP reading and writing course. That is, focusing on distinctive features of English used for reading and writing in various scientific contexts is vital. Hence, selecting appropriate genres in a variety of scientific fields may be considered in the first place so that suitable technical terms as well as linguistic featured needed for a particular genre will be highlighted and included in a unit of the course. For further studies, a reading and writing course for Science students can be developed based on the results of the present study. In order to yield such practicality in the course, with the comprehensible input which can drive learners' motivation, the content/Science instructor's opinion is essential. Apart from being an informant as a stakeholder in the need analysis process, the Science instructor can be part of the course, as a co-course designer or a co-instructor, as can be seen in a content-based or content and language integrated learning (CLIL) course, in which English language can be best learned when the subject matters are delivered.

As for English reading and writing problems, ones of the most common problems, namely, skimming the text for main ideas and using language correctly and appropriately were considered the most problematic sub-skills in reading and writing, respectively, among Science students. This reflects that such some fundamental skills in both reading and writing as aforementioned are still required by Science students at KMITL. They needed such skills

as a good basis to be proficient in other complex sub-skills of reading and writing. This is what the developer of an ESP reading and writing course should bear in mind.

## Acknowledgments

This research study was funded by the Faculty of Liberal Arts, KMITL. The author really appreciates it.

## References

Adchariyaprasit, J. (2014). Thai Prosody Problems with First Year Students. *World Academy of Science, Engineering and Technology, International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, 8*(8), 2623-2625.

Alastal, A. A., & Shuib, M. (2012). Investigating the Academic English Language Target Needs of Undergraduates at the Faculty of Applied Science at Al-Aqsa University: Students' Perceptions. *The Asian ESP Journal, 8*(2), 5-26.

Berwick, R. (1989). Needs Assessment in Language Programming: From Theory to Practice. In R. K. Johnson (Ed.), *The Second Language Curriculum* (pp. 48-62). Cambridge: Cambridge University Press. http://dx.doi.org/10.1017/CBO9781139524520.006

Brindley, G. (1989). The Role of Needs Analysis in Adult ESL Programme Design. In R. K. Johnson (Ed.), *The Second Language Curriculum* (pp. 63-78). Cambridge: Cambridge University Press.

Department of Languages. (2017). *Complete Report: Science Students' Academic Record in Development of Reading and Writing Skills in English Course*. Bangkok: Faculty of Liberal Arts, King Mongkut's Institute of Technology Ladkrabang.

Dudley-Evans, T., & St. John, M. J. (1998). *Developments in English for Specific Purposes: A Multi-Disciplinary Approach*. Cambridge: Cambridge University Press.

Fadel, S., & Rajab, H. (2017). Investigating the English Language Needs of the Female Students at the Faculty of Computing and Information Technology at King Abdulaziz University in Saudi Arabia. *English Language Teaching, 10*(6), 69-82.

Graves, K. (2000). *Designing Language Courses: A Guide for Teachers*. Boston, MA: Heinle & Heinle.

Iwai, T., Kondo, K., Lim, D. S. J., Ray, G. E., Shimizu, H., & Brown, J. D. (1999). *Japanese Language Needs Analysis 1998-1999.* Retrieved from http://nflrc.hawaii.edu/NetWorks/NW13.pdf

Johns, A. M. (1991). English for Specific Purposes (ESP): Its History and Contribution to ELT. In M. Celce-Murcia (Ed.), *Teaching English as a Second or Foreign Language* (2nd ed., pp. 67-78). Boston, MA: Heinle & Heinle.

Jordan, R. R. (1997). *English for Academic Purposes: A Guide and Resources Book for Teachers*. London, UK: Cambridge University Press. https://doi.org/10.1017/CBO9780511733062

Krashen, S. D. (1982). *Principles and Practice in Second Language Acquisition.* Oxford: Pergamon Press.

Likert, R. (1932). A Technique for the Measurement of Attitudes. *Archives of Psychology, 22*(140), 1-55.

Mohammadi, V., & Mousavi, N. (2013). Analyzing Needs Analysis in ESP: A(re) Modeling. *International Research Journal of Applied and Basic Sciences, 4*(5), 1014-1020. Retrieved from https://pdfs.semanticscholar.org/48ad/ed14fab06f88603a878fe8b113d761158834.pdf

Munby, J. (1978). *Communicative Syllabus Design*. Cambridge: Cambridge University Press.

Rahman, M. M. (2012). The English Language Needs of Computer Science Undergraduate Students at Putra University, Malaysia: A Focus on Reading Skills. *English for Specific Purposes World, 12*(34), 1-25. Retrieved from http://www.esp-world.info/Articles_34/DOC/ESP_Rahman.pdf

Richards, J. C. (2007). *Curriculum Development in Language Teaching* (8th ed.). Cambridge: Cambridge University Press.

Robinson, P. C. (1991). *ESP Today: A Practitioner's Guide.* New York: Prentice Hall.

Rodsawang, S. S. (2017). Writing Problems of EFL Learners in Higher Education: A Case Study of the Far Eastern University. *FEU Academic Review, 11*(1), 268-268.

Yamane, T. (1973). *Statistics: An Introductory Analysis* (3rd ed.). New York: Harper and Row.