

# Needs Analysis of English for Engineering Staff in the Electronics Industry in Phra Nakhon Si Ayutthaya and Pathum Thani, Thailand

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## Abstract

This study aims to explore the English-language needs of 190 engineers, engineering operators and administrative staff in the electronics industry, located in Phra Nakhon Si Ayutthaya and Pathum Thani, the two central areas of Thailand. The research instruments were a questionnaire and a semi-structured interview. The data collection period ran from January to March 2019. The findings revealed that they needed to learn English in three main areas involving technical and business content, as well as daily life communication. Conversational and speaking skills were considered most needed among the participants, whereas reading and writing were less relevant. Although they realized the importance of English and showed interest of learning the language, their main constraints concerned time, family, work schedule and finance. Similar to the younger Thai generation, they liked surfing the Internet and experiencing online entertainment which somehow helped improve their English language skills. A self-learning module combining not only authentic engineering contents, but also business and general circumstances with a sense of pleasure and fun was recommended.

**Keywords:** needs analysis, ESP, engineering, electronics industry

## Introduction

In the era of Thailand 4.0, English has become a major global language across businesses and industries. Electronics manufacturers as part of the industrial sector being promoted in Thailand have a strong need for human resources equipped with English proficiency to increase competitiveness in the global market. However, little research has been conducted into this area of inquiry. Therefore, needs analysis of employees in an electronics manufacturing context should be conducted. To meet the stakeholders' English-language needs, suitable guidelines and teaching and learning materials for English training for communication must be tailor-made for engineering personnel.

## Literature Review

### *Importance of English Language as a Global Language and Thailand 4.0*

English is currently an international language, which is widely used as a means for communication among people of different language and cultural backgrounds (Cambridge Assessment, 2019; Crystal, 1997; Rappa & Wee, 2006). It acts as a catalyst for the economic development of Southeast Asian countries. As stated by Pandey (2014), the world is now entering the revolution of communication; hence English is used as a lingua-franca of the business world, and recognized as one of the six official languages of the United Nations. Moreover, according to ASEAN Article 34, English has been assigned as the working language of ASEAN countries.

Due to the policy of Thailand 4.0., many local and international companies in Thailand agree that effective English language skills are crucial for their employees as this increases the likelihood that the companies will achieve market penetration at the regional and international levels. As for employees, English language competence is considered critical. It is an important tool that assists them to progress in their career path, allows them to access and update their technical information, and facilitates self-development (Cheep-Aranai, Chutichaiwirath, Grubbs, & Brady, 2017; Hart-Rawang, 2009). Thus, English communication skills are necessary to serve the demand of the global and local businesses, enabling Thailand and its workforce to progress toward Thailand 4.0. Professional and English skills are equally required by the manpower in the era of Thailand 4.0. Yet the Department of Industrial Promotion (2017) stated that Thailand lacks quality manpower development in the electronics industry, relating to both professional and English language competency. Thus, it should be noted that more research into the needs of technical personnel is required.

### *Electronics Industry in Thailand and Needs of English Language*

Smart electronics is one of the new targeted S-curve industries that the government of Thailand is promoting. Regarding the 1976 annual revenue of this industry, it was worth approximately a quarter of all national exports. In 2016, the electronics industry hub was worth \$55 billion and ranked 14<sup>th</sup> largest electronics and electrical exporter in the world (Board of Investment, 2019). Phra Nakhon Si Ayutthaya and Pathum Thani, two provinces in central Thailand, are home to many electronics factories. Consequently, Pinprathomrat (2019), former President of Rajamangala University of Technology Thanyaburi (RMUTT), Pathum Thani and a current Thai senator, announced a university policy to serve the needs of Thai human capital with regard to the electronics industries. Moreover, RMUTT is located at Pathum Thani, adjacent to Phra Nakhon Si Ayutthaya, where many industrial estates are also situated, including numerous electronics plants. In other words, both provinces are suburban provinces to the north of Bangkok where a large number of Thai and foreign companies and factories including those related to production of electronics spare parts are located (<http://thailandindustry.blogspot.com>). Thus, a special needs

analysis for a particular group of employees in the electronics industry is required; and the data obtained could be used for designing a training module that meets the needs of learners at work.

### *Needs Analysis of Employees in ESP Context and English Training*

Although a plethora of research studies were conducted on needs analysis of Thai employees in different industries, especially hospitality businesses, most focused more on the service industry. However, reviewing these studies could provide important guidelines for directing the needs analysis, in order to design English for Specific Purposes (ESP) training for employees in the electronics engineering industry. Cheep-Aranai et al. (2017) investigated English language proficiency needs for business workers, both at the operational and management levels. They also investigated English proficiency needs for English major students, and for English major students with the aim to find out whether there was a gap between what was learned at the university and what was expected from a new graduate in the actual business sector. The data obtained could be used for outlining a business English module. The instruments used were a questionnaire and a semi-structured interview. The interviewees, selected by purposive sampling, included those in managerial position, such as a director, a manager, and a trainer in a hotel. The questions asked were related to the importance and needs of business English, methods of communication, and authentic learning materials. The participants were 96 students, who responded to the questionnaires asking for their demographic data, needs of business skills, and business English related to jobs in the market. It was found that there were employers who preferred students' English ability over the knowledge of content and knowledge of the world. This included positive language ability and positive work characteristics, such as eagerness to learn new things, activeness, cheerfulness, confidence, creativity, thinking skills, and responsibility. It should be noted that there was some mismatch of the skills needed. From the business' point of view, the correspondence was made through email. The students, however, focused on the listening and speaking skills for a business purpose.

In addition to Cheep-Aranai et al. (2017), Prachanant (2012) claimed that needs analysis plays a crucial role in the curriculum of developing ESP. The study surveyed the needs, functions and problems of the English language of 40 tourism employees. A questionnaire was used and data were analyzed by frequency, percentage, mean, and standard deviation. It was found that speaking was the most important skill, while the less important ones were listening, reading, and writing, respectively. The three most relevant functions in using English language were giving information, followed by providing services, and offering help. Four English-use problems were related to the inability to understand foreigners' accents, inappropriate words and expressions, inadequate vocabulary, and lack of grammar knowledge.

Moreover, Chenaksara (2005) conducted research on needs analysis for English communication skills of the Thai airways international cabin crew. The study explored the English communication problems of the Thai Airways international cabin crew and analyzed the English training needs for English communication skill improvement. The results showed that listening and speaking skills were perceived as their problems. The major cause of the listening problem was accent, especially Australian and Indian. English being the second language of the cabin crew was the main cause of the speaking problem.

To the researchers, the analysis of English needs of workers is one of the most important steps, prior to the design of an English training module for a particular group of learners (Brown, 1995; Cheep-Aranai et al., 2017; Dudley-Evan & St John, 1998; Hutchinson & Waters, 1987; Jordan, 1997; Long, 2005). Different groups of professions appear to possess specific aspects of their own English language needs, including problematic skills and the priority given to each particular skill. There are some similarities, such as the appropriateness of accents, and events and functions needed to be taught. Particular groups of businesses apparently possess some level of English specialty. This could range from different knowledge of vocabulary, expressions, grammatical structures, accents, skills, events, functions and contexts, to differences among individual employees. This kind of information is important and must be used as a basis for course design. From the studies being reviewed in this research, a questionnaire and an in-depth interview are commonly used as research instruments for understanding these particular aspects of the needs of specific groups of participants. The information from the review of the past research is taken into consideration in the research design of the present study.

### *English Communication for Engineers*

Regarding research into English communication among Thai engineers, Hart-Rawang (2009) explored English language communication in an engineering workplace in Thailand. The purpose was to design a suitable ESP training syllabus for automotive engineering. Three groups of participants were: 1) automotive engineers in automotive parts manufacturers, 2) foreign engineers, and 3) ESP teachers from two selected technology universities in Thailand. The two main research instruments were a questionnaire and an in-depth interview. It was found that all four skills of English language are important to these global engineers, especially when they needed to take part in a conversation. Moreover, English can act as a blockage preventing an engineer from exploiting their professional knowledge; while Thai engineers with proficient English find English as an opportunity to make contact with overseas partners and customers, gain the latest knowledge and technology, as well as to gain opportunities for career advancement. As stated, English is important for their professional communication worldwide. Therefore, general English, business English, technical English, skills development, and learning strategies are crucial aspects in which they need to be trained. However,

time management and limited financial resources are two main constraints preventing employees from attending training.

Regarding the instrument used for examining needs analysis, Tangprakun (2010) used a questionnaire to survey the English for communication skills toward English needs of engineering staff working in Bangkok. Similar to Hart-Rawang (2009), the data obtained from 79 Thai staff were used for designing an English training module for engineers. The instrument was a questionnaire. Descriptive statistics used for the analysis were percentages, frequencies, means, and standard deviations. The results revealed that out of the four English language skills, these engineers were able to perform best in reading skill, while the most problematic skill was listening.

Unlike Hart-Rawang (2009), Abraham (2008) examined English communication needs of Chinese undergraduate engineering students at UiTM Pulau Pinang in Malaysia. It was found that effective speaking and writing skills were essential to the work of these practicing engineers and the universities should equip them well with these skills before graduation. Real life experiences, such as group meetings and public speaking, were very important.

Similar to Abraham (2008), Kassim and Radzuan (2008) suggested that effective English oral communication skill is beneficial to employees in their workplaces. In the engineering manufacturing industry in Malaysia, professional engineers with decent English oral communication skills can successfully execute routine work, and possibly be promoted for career advancement. It is important that engineers need to have adequate English communication skills, especially the speaking skills in order to function well in particular events at their workplaces. It was concluded that Malaysian higher institutions must prepare their engineering undergraduates with adequate English communication skills, as this can affect their employability.

In Thailand, novice engineers tend to lack confidence when communicating in English, especially orally (Jarupan, 2013; Kaewpet, 2011; Rajprasit, Pratoomrat, Wang, Kulsiri, & Hemchua, 2014). Their problems in speaking and reading affect their professional communication at work (Jarupan, 2013; Rajprasit et al., 2014). It was also reported that Thai automotive engineers need effective English skills involving listening, speaking, reading, writing, and language learning strategies (Hart-Rawang, 2009).

According to Clement and Murugavel (2015), engineering students need training from their English teachers to improve their confidence in using English which relates to employability after graduation. However, most engineering syllabi tend to emphasize mechanical content, rather than English-language skills development (Ayokanmbi, 2011; Raina & Pande, 2012). In addition, global engineers need to acquire English and multicultural skills (Ayokanmbi, 2011). In Thailand, new engineers lacked confidence in speaking (Kosanashunhanan, 2016), while more experienced engineers still struggled with their writing at work (Hart-Rawang & Li, 2008; Joungtrakul, 2018; Loahachsiboon, 2011). To the researchers, the different problematic skills of recent engineering graduates and senior engineers may result

from their dissimilar responsibilities in organizational structure. While new graduates take care of basic oral tasks, highly experienced employees are more likely to deal with written forms of communication.

Similarly to the majority of prior research results, Kosashunhanan (2016) carried out a study to investigate problems of communicating in English language among Thai engineers in Japanese companies located in Thailand. A questionnaire and an interview were used as the instruments for data collection. The results showed that most Thai engineers at an operational level used English every day. Reading skills were mostly used for reading emails and reading information from the Internet. Listening was their second priority especially during meetings, business contact, and when relaxing with listening to songs and watching movies. Writing was needed for email contact. Speaking, however, was hardly used at work. The problems in using English were related to vocabulary and grammar. This could affect Thai engineers' English reading and writing skills. From the reviewed literature, it appears to the researchers that engineers need effective English-language skills in order to operate daily at work and potentially for career advancement. Lack of vocabulary and grammatical knowledge is believed to be one of the main sources of their English communication constraints.

It should be noted that employees' ability to use English at work is desirable. However, quite a number of novice engineers, or engineering students who are entering the engineering profession, appear to have limited English proficiency and are not meeting the standard for the engineering profession (Kaewpet, 2011; Rajprasit et al., 2014; Wattansakulpusakorn, 1996). Moreover, they had limited writing abilities (Wanchid, 2007) and also lacked confidence, especially in their speaking and reading skills (Jarupan, 2013). An English training module, therefore, is needed to increase English language proficiency of employees. This module needs to include general English, business English, and technical English relevant to the context at work (Cheep-Aranai et al., 2017; Hart-Rawang, 2009). However, the researchers stated that the English used in the electronics industry is different from that used in other industries.

The researchers conducted this study to investigate the English language needs of engineers in the electronics industry. The findings of the study may reveal the specific English language needs of engineers, engineering operators, and administrative staff in Phra Nakhon Si Ayutthaya and Pathum Thani electronics companies. The realization of the language needs in the workplace will create opportunities for the companies or administrators to design an effective English language curriculum, which will suit engineering staff at both operating and administrative levels, especially those in Phra Nakhon Si Ayutthaya and Pathum Thani in order to meet the needs of Thailand 4.0.

## **Research Objectives**

This study aims to examine English language needs of engineers, engineering operators, and administrative staff at Phra Nakhon Si Ayutthaya and Pathum Thani electronics manufacturing companies with regard to their demographic information, work related to English language use and skills/strategies required in English courses/classroom, and English language communication discourse and limitations of English proficiency.

## **Research Methodology**

Based on quantitative and qualitative approaches, a questionnaire and an interview were employed.

### *Research Instruments*

A Likert rating scale questionnaire comprised of 38 closed-questions was administered to examine the participants' English-language needs. This questionnaire was developed using the study of Hart-Rawang (2009), which initially investigated needs of automotive engineers working in Thailand. The questions were validated by experts in the fields of English and electronics engineering (IOC=0.95). The questionnaire was divided into four main parts: demographic information of the participating engineers, engineering operators and administrative staff as well as evaluation of English proficiency; work related to English language use and skills/strategies required in their English courses; English language communication discourse of engineers/ engineering operators/administrative staff; and limitations of English proficiency. The data were analyzed and presented in the forms of frequency and percentage.

Semi-structured interviews were conducted on a voluntary basis with two engineers, two engineering operators, and two members of administrative staff. The questions were in accordance with the following aspects: The role of the English language in the workplace; advantages and disadvantages for those who can use the English language; measures taken to improve English language abilities of engineers, engineering operators and administrative staff in the workplace; and limitations for the measures implemented. The interview data were recorded, transcribed, and grouped for further data analysis and discussion.

### *Samples*

The samples in this research were engineers, engineering operators, and administrative staff in electronics manufacturing workplaces in Phra Nakhon Si Ayutthaya and Pathum Thani. The total number of the samples was 190, including 86 engineers, 61 engineering operators, and 43 administrative staff members in three electronics manufacturing workplaces. Once the initial answers from the open-ended questions were explored, the semi-structured interviews were conducted.

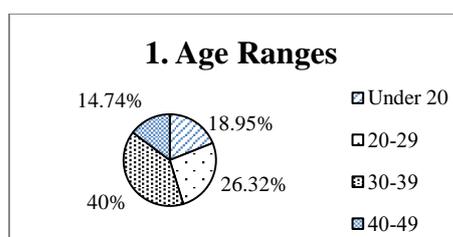
From the list of electronics companies in Phra Nakhon Si Ayutthaya (Phra Nakhon Si Ayutthaya Provincial Industry Office, 2019) and Pathum Thani (Pathum Thani Provincial Industry Office, 2019), seven companies voluntarily participating in this study, including three in Phra Nakhon Si Ayutthaya and four in Pathum Thani. All of the participants were employees who volunteered to take part in this research.

## Results

This section includes the findings, as shown in the following parts:

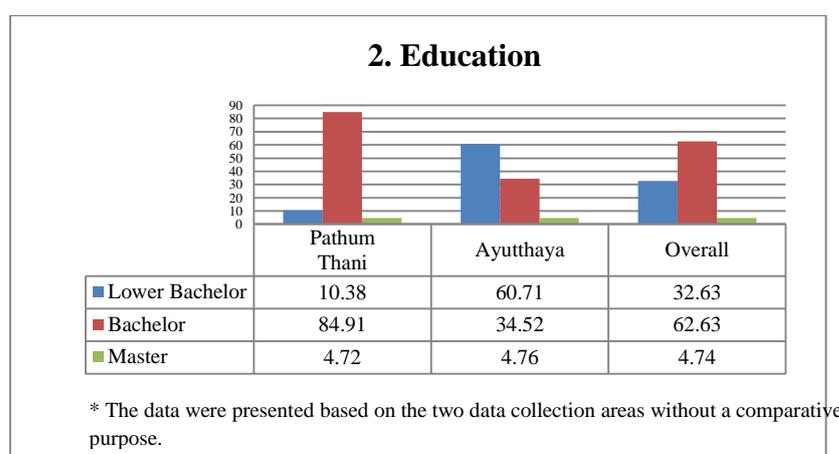
### *Demographic Information and English Language Proficiency*

There was a total of 190 participants (N= 190) including engineers (EN), engineering operators (EO), and administrative staff (AS), who were responsible for three areas of work involving process planning, production line, and quality control.



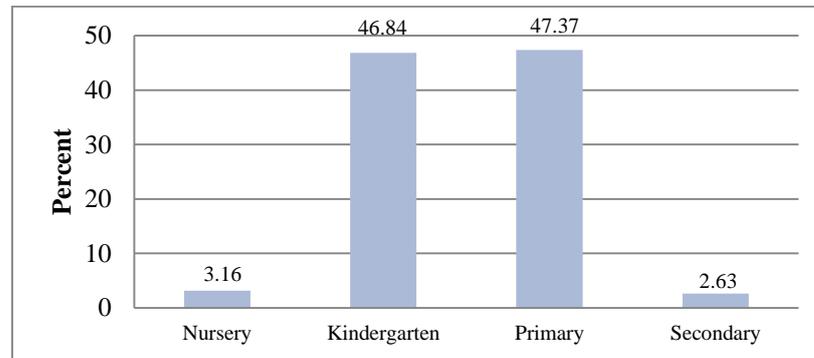
**Figure 1. Age Ranges of Participants**

From the demographic information, the percentage of male workers (62 %) was more than half of the total number of participants in this study. With respect to the age ranges (Figure 1), nearly two-thirds of participants were aged 20-39 years old (approximately 67%). They mainly held bachelor's degree (63%) or less (33%) as shown in Figure 2.

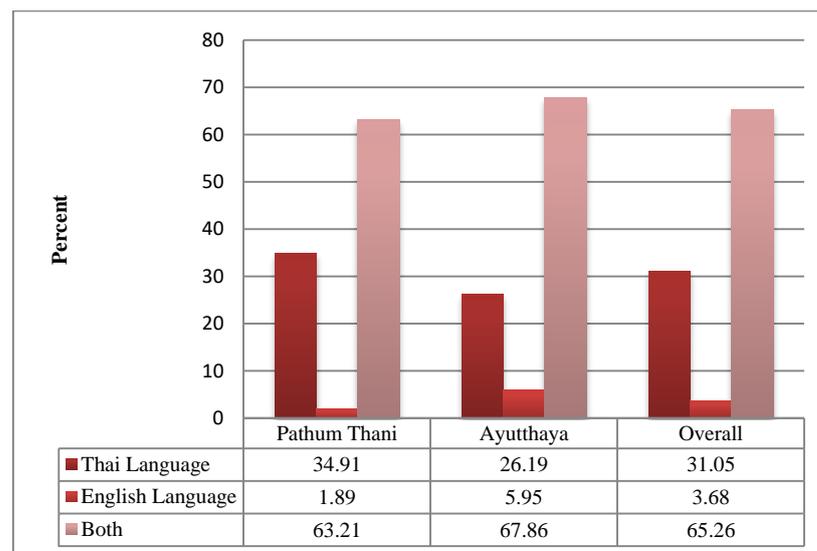


**Figure 2 Education Levels of Participants**

In addition, as shown in Figure 3, the majority of the participants (94%) reported that they started learning English language either in kindergarten or primary school. Primarily, the instructors used both Thai and English (65%) in class (Figure 4). Overall, most participants (70%) reflected that they were not able to use English effectively. Still, the remainder (30%) said their English language is effective enough.



**Figure 3. Stage Started Learning English Language**



\* The data were presented based on the data collection areas without a comparative purpose.

**Figure 4. Medium of Instruction**

When being asked to perform individual self-rating on skills (Table 1), most participants specified that their best skill was conversation with a mean score of 1.98, followed by reading ( $\bar{x}$ =1.93), writing ( $\bar{x}$ =1.84), and speaking ( $\bar{x}$ =1.69). However, overall participants appeared to rate their self-rating scores below average ( $\bar{x}$ =2.00). It should be noted that they rated conversation skill as the most fluent, with speaking skill the least. From this it could be interpreted that the participants

may need to improve their speaking skills such as oral presentation and public speaking.

**Table 1. Four-Point Self-Rating Scale on English Skills**

Self-rating on English Skills	Mean	S.D.
Conversation/Interaction	1.98	.91
Reading	1.93	.70
Writing	1.84	.69
Listening	1.75	.73
Speaking	1.69	.71
Overall English proficiency	1.76	.68

In respect to the participants' English language training experience, it was found that after graduation, more than half (54%) reported they sometimes attended English training courses, while approximately 40% answered they rarely or never attended training. It should be noted that although more than half reported that they sometimes attended training, the data from the interview reflected that they in reality hardly attended any courses. In addition, most participants had never experienced overseas training, as only 15% mentioned they have ever trained abroad, and the length of the training was three months maximum.

**Table 2. Means of English Proficiency Development**

Means of English Proficiency Development	Frequency	Percentage
Self-studying through commercial English language learning books	63	33.16
Listening to English songs and watch soundtrack films	52	27.37
Watching/Listening to news or programs on radio and TV	39	20.53
Studying at good reputation English language institutes	15	7.89
Practicing with foreign friends/staff	13	6.84
Taking an English course conducted by experience English native teachers	6	3.16
Other	2	1.05

Table 2 reveals that over 80% of participants relied on themselves for English-language development using three main means on their own: self-studying through commercial books (33.16%), listening to English songs and watching soundtrack films (27.37%), and watching or listening to news or programs on television or radio (20.53%). The remainder reported that they developed their English through interaction with English-language instructors, English native speakers, and foreign friends/staff.

**Table 3. Limitations of English Proficiency Improvement**

<b>Limitations of English Proficiency Improvement</b>	<b>Frequency</b>	<b>Percentage</b>
Family responsibility	53	27.89
Time constraint	48	25.26
Course fees	38	20.00
English background knowledge	23	12.11
Commuting to study	22	11.58
Health problems	4	2.11
Others	2	1.05

Table 3 shows that three main constraints for the improvement of English proficiency were primarily related to family responsibility, time constraint, and course fees, respectively. Moreover, English background knowledge was also taken as another limitation for the improvement of their language proficiency.

#### *Job Responsibilities and Impacts of English at Work*

This section deals with the work that the participants were responsible for and particular aspects of English they needed to use at work. Table 4 and Table 5 show that most of the participants were engineers (45%) and engineering operators (32%). There were others (23%) whose job titles were not engineers or engineering operators. Two main departments in which the participants worked were Production Line (44%) and Process Planning (42%). The remainder worked in the Quality Assurance department (14%).

**Table 4. Current Job Positions**

<b>Current Job Positions</b>	<b>Frequency</b>	<b>Percentage</b>
Engineers (EN)	86	45.26
Engineering operators (EO)	61	32.11
Administrative staff (AS)	43	22.63

**Table 5. Work Departments**

<b>Work Department</b>	<b>Frequency</b>	<b>Percentage</b>
Production Line	84	44.21
Process Planning	79	41.58
Quality Assurance	27	14.21

As shown in Table 6, only 7% always used English in their daily life. The majority (over 90%) mentioned that they sometimes to never used English on a daily basis.

**Table 6. Total Use of English in Daily Life**

<b>Total Use of English</b>	<b>Frequency</b>	<b>Percentage</b>
Sometimes	73	38.42
Seldom	53	27.89
Never	50	26.32
Always	14	7.37

The results shown in Table 7 indicate that the staff considered that English proficiency played an important role in work advancement.

**Table 7. English Proficiency and Its Impact on Work Advancement**

<b>English Proficiency and Its Impact on Work Advancement</b>	<b>Frequency</b>	<b>Percentage</b>
Little	40	21.05
Fair	100	52.63
Strong	39	20.53
Tremendous	11	5.79

Accordingly, as shown in Table 8, three main opportunities were created as immediate benefits from satisfactory English ability involved the opportunities to: work at overseas plants, earn better pay, and be promoted to a higher position (78% total).

**Table 8. Work Opportunities Resulted from Good English Ability**

<b>Work Opportunities Resulted from Good English Ability</b>	<b>Frequency</b>	<b>Percentage</b>
Work in overseas plants	61	32.11
Earn better paid	45	23.68
Promoted to higher position	42	22.11
Attend overseas training	11	5.79
Start own business	8	4.21
Study abroad	8	4.21
Direct business contact	8	4.21
Others	7	3.68

The participants' attitudes on the importance of English language toward their work and career advancement can have a very strong impact on participants' motivation and success of the training module. These factors should be taken into consideration when designing an English training module for this particular group of learners.

#### *English Language Communication Discourse of Engineers/Engineering Operators*

Table 9 indicates that from the four-point rating scale, three main areas of English needs were three-fold: Technical English ( $\bar{x} = 3.12$ ), Business English ( $\bar{x} = 3.07$ ), and General English ( $\bar{x} = 3.06$ ). It should be noted that all three of these areas were rated at a high level.

**Table 9. Contents Required in Your English Course**

<b>Content Required</b>	<b>Mean</b>	<b>S.D.</b>
Technical English relating to your working situation	3.12	.82
Business English such as discussion, negotiation, giving oral presentation, attending meetings	3.07	.88
General English such as Greeting and Socializing	3.06	.84

Table 10 displays the results from the four-point rating scale regarding how often participants performed a list of 33 reading tasks. As can be seen, the participants needed to read a variety of texts as they reported that they performed nearly half of the reading tasks (item 1-16) more than the average score ( $\bar{x}=2.58$ ). These tasks included instructions and signs, reports or notes of technical work or problems, manuals, tables, graphs and figures, and emails from

customers/suppliers/professionals. It should be noted that these reading text types included both technical, business and general texts. There seems to be a wide range of reading texts involved in this group of participants.

**Table 10. Reading Texts**

<b>Reading Tasks</b>	<b>Mean</b>	<b>S.D.</b>
1. Instructions how to perform a job	2.87	.86
2. Reports of details of jobs done	2.81	.91
3. Emails circulates within the plant	2.79	.92
4. Equipment manuals	2.76	.85
5. Safety signs	2.74	.83
6. Analysis reports of problems	2.74	.90
7. Machine tools/gauges	2.73	.90
8. Tables	2.72	.91
9. Reports of technical notes	2.72	.94
10. Emails from customers/suppliers/professionals	2.72	.93
11. Labels	2.71	.85
12. Statistical data	2.67	.91
13. Notes/Messages	2.67	.87
14. Worksheets	2.66	.83
15. Graphs	2.63	.90
16. Company policy statements	2.62	.82
17. Business letters from customers/suppliers	2.58	.98
18. Minutes of meeting	2.56	.91
19. Online reading materials	2.56	.80
20. Technical drawing	2.56	.95
21. Reports of machine Status	2.55	.91
22. Technical texts	2.53	.85
23. Quotation documents	2.53	.92
24. Memorandums of existing situation	2.49	.77
25. Temperatures	2.46	.86
26. Journal articles	2.42	.84

27. Advice cards	2.39	.77
28. Business letters from professionals	2.38	.98
29. References	2.37	.82
30. Memorandums of materials requests	2.37	.84
31. Proposals	2.33	.86
32. Lubrication schedules	2.29	.81
33. Newspaper articles	2.23	.76
	$\bar{x}=2.58$	

However, the data from the interviews suggested that participants felt the reading tasks were not the problem because they could use online tools and sources for support, such as Google Translate. This may suggest the direction for the training of reading skill for lifelong learning. For example, the training module might need to focus on how to effectively use Google Translate for reading skill development.

Not so different from the reported reading text types but with less degree of occurrence, Table 11 reveals that participants reported that they performed a wide range of writing tasks as listed. The more common writing tasks include the following: writing emails, instruction and safety signs, tables, graphs and figures, labels, forms, work and problem reports, notes and messages, and manuals. It should be pointed out that these writing tasks were used for both internal and external communication. Some were related to technical work, while others were for business correspondence. Even though the writing tasks varied, most of these can be retrieved from the Internet in the form of ready-made templates. The training module may need to focus on how the participants could retrieve and make full use of these available sources.

**Table 11. Writing-Skill Related Texts**

Writing Tasks	Mean	S.D.
1. Emails circulates within the plant	2.67	.90
2. Instructions on how to perform job	2.66	.90
3. Analysis report of problems	2.63	.90
4. Reporting of details of job done	2.62	.88
5. Emails from customs/suppliers/ professionals	2.61	.90
6. Tables	2.56	.83
7. Safety signs	2.55	.84
8. Statistic data	2.55	.84
9. Graphs	2.54	.85
10. Notes/messages	2.53	.86
11. Reporting of technical notes	2.51	.94
12. Equipment manuals	2.48	.91
13. Memorandums of existing situations	2.46	.82
14. Minutes of meeting	2.46	.89
15. Worksheets	2.45	.86
16. Technical drawing	2.44	.87
17. Business letters from customers/suppliers	2.44	.92
18. Leave forms	2.42	.83
19. Labels	2.41	.90
20. Business letters from professionals	2.39	1.00
21. Company policy Statement	2.38	.81
22. Logbooks	2.38	.86
23. Reporting of machine status	2.36	.88
24. Quotation documents	2.33	.85
25. Proposal	2.33	.87
26. Timesheets	2.31	.84
27. Memorandums of materials requests	2.29	.80
28. Technical texts	2.28	.84
29. Journal articles	2.23	.82
30. Advice cards	2.20	.84
31. Shift reports	2.18	.89
32. Lubrication schedules	2.04	.82
	$\bar{x}=2.4$	

Table 12 shows the situations in which participants needed to converse in English at work. Most of the conversation situations listed were rated higher than average ( $\bar{x}=2.00$ ), except for the last situation, “Chair a meeting” ( $\bar{x}=1.85$ ). Numbers were related in the forms of telling time and stating numbers. Participating in a discussion as well as describing figures and graphs were the top four conversation situations. Others were related to giving instruction and describing a machine and equipment. Apart from that, the conversation circumstances were related to everyday life situations, such as socializing and entertaining guests.

**Table 12. English Conversation**

<b>Conversation Situations</b>	<b>Mean</b>	<b>S.D.</b>
1. Tell the time	2.45	.82
2. Describe daily routine/ job responsibility	2.39	.84
3. Describe graphs/statistics/performance	2.38	.83
4. Describe numbers	2.35	.83
5. Give instructions	2.34	.92
6. Describe causes and effects of problems	2.32	.92
7. Describe possibility/probability/prediction/trend	2.31	.80
8. Make an oral presentation or a report	2.27	.92
9. Socialize and entertain foreign customers/professionals	2.24	.80
10. Express opinions	2.23	.85
11. Discuss problems and make final decisions	2.23	.92
12. Classify	2.21	.84
13. Define and clarify meaning	2.21	.89
14. Give advices to customers/staff	2.20	.87
15. Make a phone call	2.17	.81
16. Staff/supervisors/professionals/customers/suppliers	2.17	.84
17. Make an appointment	2.17	.90
18. Describe a machine/equipment	2.16	.86
19. Attend a meeting/seminar/conference	2.16	.88
20. Explain problems (faults) of machines/equipment	2.16	.87
21. Give and receive over the phone	2.09	.82
22. Explain procedures and cycles	2.06	.80
23. Chair a meeting	1.85	.79
	$\bar{x}=2.22$	

It should be emphasized that the virtue of conversation is that it is a real-time, face-to-face communication. This will need to be taken into consideration while designing the training module, especially when training is mainly carried out online.

### *Limitations of the Participants' English Proficiency*

In this section, limitations of the participants' four language skills are reported. Table 13 shows the participants' speaking difficulty. From the four-point rating scale, it was revealed that the participants appeared to have difficulty relating to coping with the problems of real-time speaking. It was reported that participants were worrying about making a mistake while speaking ( $\bar{x}=2.91$ ), and entering a discussion ( $\bar{x}=2.88$ ). Other problems were related to not knowing how to say something ( $\bar{x}=2.85$ ), wording in a real-time conversation ( $\bar{x}=2.84$ ), and appropriateness in speaking ( $\bar{x}=2.82$ ), while pronunciations ( $\bar{x}=2.79$ ) and oral presentation ( $\bar{x}=2.68$ ) were less problematic. It could be speculated that lack of effective communication strategies could be one of the main sources of problems for participants' real time speaking. Training in basic communication strategies may facilitate the conversation skill of this particular group of participants.

**Table 13. Difficulty with Speaking Skills**

<b>Difficulty with Speaking Skills</b>	<b>Mean</b>	<b>S.D.</b>
1. Worrying about saying something wrong in the case you make a mistake in the English	2.91	.77
2. Finding it difficult to enter discussion	2.88	.82
3. Not knowing how to say something in English	2.85	.81
4. Having trouble wording what you want to say quickly enough	2.84	.79
5. Not knowing the best way to say something in English	2.82	.79
6. Having difficulty with your pronunciation of words	2.79	.81
7. Having difficulty giving oral presentation	2.68	.74
	$\bar{x}=2.82$	

Similar to speaking difficulty, Table 14 illustrates that from the four-point rating scale, listening was also problematic especially when listening to lengthy texts, presentations, discussions, and speeches. Problems also occurred when listening and taking notes. It should be emphasized that participants appeared to have difficulty with basic listening skills. The training module may need to include basic listening strategies for different kinds of tasks, such as listening for keywords and main idea, listening for specific information, listening for comprehension, and deriving effective note-taking from listening.

**Table 14. Difficulty with Listening Skills**

Difficulty with Listening Skills	Mean	S.D.
Having trouble understanding lengthy spoken texts	2.92	.78
Having trouble understanding presentation or discussion	2.72	.75
Having trouble understanding the subject matter of a talk, i.e., what is being talked about	2.68	.77
Having trouble taking notes while attending meeting/seminar/conference	2.65	.73

Table 15 sheds light on participants' problems with English writing. The participants reported their problems were both at local and global levels, including grammatical structures ( $\bar{x}$ =2.85), finding ideas ( $\bar{x}$ =2.81), and choices of words ( $\bar{x}$ =2.81). Surprisingly, the participants reported that spelling ( $\bar{x}$ = 2.70) was more problematic than organizing ideas in a paragraph ( $\bar{x}$ =2.67). Punctuation was found to be the least problematic ( $\bar{x}$ =2.55). Hence, materials for teaching of writing skills to these particular participants need to concentrate on expressing ideas both at a sentence and text level as well as punctuation. However, the data from the interviews pointed out that they did not think they had much trouble with writing at work, since they could seek writing support from different sources (e.g., the Internet and colleagues). Again, the training module should emphasize how the participants could make use of these available tools for their writing skill development. Nevertheless, relevant and effective feedback must be provided regularly.

**Table 15. Difficulty with Writing Skills**

Difficulty with Writing Skills	Mean	S.D.
Structuring sentences	2.85	.76
Finding ideas	2.81	.80
Using appropriate vocabulary	2.81	.76
Expressing ideas clearly	2.78	.82
Using correct spelling	2.70	.75
Organizing ideas in a paragraph	2.67	.82
Using correct punctuation, such as a comma	2.55	.83

Similar to the other skills, but to a lesser extent, reading appeared to be problematic with mean scores ranged between 2.71-2.51 as shown in Table 16. Reading a text quickly in order to establish a general idea of the content (skimming) appeared to be the most problematic ( $\bar{x}$ =2.74), followed by understanding special vocabulary in a text ( $\bar{x}$ =2.71), and guessing unknown words in a text ( $\bar{x}$ =2.70). Surprisingly, locating and understanding details was less problematic than recognizing text organization, understanding main ideas, and general comprehension. Being familiar with particular text types and reading strategies could affect participants' responses to the

difficulty with reading skills. The training module should also introduce strategies for vocabulary enhancement, such as mind-mapping or games.

**Table 16. Difficulty with Reading Skills**

<b>Difficulty with Reading Skills</b>	<b>Mean</b>	<b>S.D.</b>
Reading a text quickly in order to establish a general idea of the content (skimming)	2.74	.87
Understanding special vocabulary in a text	2.71	.76
Guessing unknown words in a text	2.70	.82
Looking through a text quickly in order to locate specific information (scanning)	2.69	.82
Reading a text slowly and carefully in order to understand details of the text (comprehension)	2.63	.81
Understanding text organization such as defining and classifying things, or describing processes	2.62	.78
Understanding the main points of text	2.57	.79
General comprehension	2.51	.80

From the interview responses concerning needs in terms of the four English skills, listening and speaking seemed to be the most problematic followed by writing and reading, respectively. One of the main factors could relate to the participants' background, as well as their personal experiences and preferences. These particular factors should be paid attention to during the design of the materials and course. Therefore, the training module should take participants' demographic data, needs, job responsibilities, and constraints into consideration. An online training module may be one of the most effective means of English skill development for the engineering workforce.

## **Discussions and Recommendation**

### *Nature of the Participants*

#### *1) Particular Characteristics*

This group of participants included engineering operators (EO), engineers (EN), and administrative staff (AS). The majority were male, with ages ranging from 20 to 39. Their education ranged from below undergraduate to graduate. Most of them started English language learning at either kindergarten or primary levels. They reported having limited English language proficiency, especially speaking and listening skills. The skill they perform highest is reading. Other constraints when considering

workplace training include individual factors such as personal work routine, time constraint, and financial restriction (Hart-Rawang, 2009).

### *2) Participants' Language Needs*

From the findings, participants employed three main means: self-studying through commercial books, listening to English songs and watching soundtrack films, and watching or listening to news or programs on television or radio. This reflects the current lifestyle of English learners who spend most of their time using social media and entertainment. Unintentionally, they might have developed English proficiency through those relaxing activities in their free time. It is, therefore, interesting to utilize edutainment resources for English skill development with a learning goal, as well as learning English for pleasure with intrinsic motivation. Nonetheless, it was found that only motivation alone cannot lead to students' learning perseverance (Boekaerts, 2016; Gibbs & Poskitt, 2010). Moreover, the students can still be engaged, even though they are possibly reluctant to use self-regulatory strategies (Boekaerts, 2016).

From other research (Cakir, 2013; da Rocha Seixas, Gomes & de Melo Filho, 2016; Han & Finkelstein, 2013; Pellas, 2014), students' engagement increased when they use learning technologies. Yet, there is a relationship between engagement and learning; meaning that if learners have no engagement, they do not learn (Reeve, 2012). In addition, Reeve (2012) claimed that engagement may be a key learning factor that more effectively indicates learners' success, better than teacher instruction does. Development of materials to be used for promoting English language learning of these particular participants should take both technology and learning engagement into consideration.

Years of studying English language, how the participants were taught, and their experiences attending English training courses can all contribute to participants' perception toward their English-language proficiency and their individual English skills. It should be noted that participants all rated their English skills below average. Moreover, their main constraints related to personal limitations including family, time, and course fees. Even though they rarely or never experienced training abroad, their linguistic background knowledge was not one of their main drawbacks toward English-language learning. How the participants have experienced learning English, as well as personal limitations, factors that need to be taken into consideration when designing an English training module for the participants in this current study.

### *3) Differences among Participants*

The recognition of opportunities to use English for advancement among engineering, engineering operators, and administrative staff were different and might be a result of organizational support. According to Cheep-Aranai et al. (2017), in some organizations there was no party responsible for an in-house language training module. However, in this study, few interviewees themselves accepted they would be able to join a language training module provided by employers due to the

burden of being overloaded (EN1) as highlighted in the following extract from an interview:

*Studying English at my workplace is difficult because there are no workers who can take over my job. (EN1)*

In addition, one of the interviewees (EN2) mentioned that they were not allowed to take leave for learning purposes outside of the factory because of a tight working schedule, as mentioned in the following extract:

*My boss does not support the idea of me taking an English course outside of work. (EN2)*

In addition, AS1 and AS2 suggested they could not afford time to undertake the training module due to increased traveling expenses and delays in relevant working processes, such as customer service transactions and delivery timetables, as highlighted in the following interview extracts:

*Travelling to study at a language school will cost too much money. (AS1)*

*Customers may contact me to ask about delivery status at any time, so I can't join the class outside the factory. (AS2)*

For the researchers, due to the fact that more than half of all respondents agreed that English proficiency had an impact on their career advancement, the emphasis should be on enforcement of workplace policy in a practical way. In addition, relevant support should be provided to encourage the employees' English language development.

### *Suggested English Language Training Module*

#### *1) Content*

The content should involve technical, business, and general areas. Reading, writing, conversation, listening and speaking skills should all be included in the training module, as shown in Table 17.

**Table 17. Content of Training Module**

<b>Unit</b>	<b>Content</b>	<b>Tasks</b>	<b>Materials</b>
1	First Meeting and Chit-chatting	Self-introduction Small talk	Game cards, Flinga
2	Socialization	Giving farewell speech	YouTube
3	Talking about Favorite Food	Speaking	YouTube
4	Saying it intelligibly!	Pronunciation	Online dictionary websites, music videos
5	Working in a Digital Factory	Searching for descriptions of technical terms	Google Translate, Kahoot
6	Reading at Work	Reading manuals, notices and memos	Technical texts on website

7	Business Visit	Presentation of organization, department and job responsibilities	Company's websites, YouTube, company's annual report
8	Products and Sales	Presentation of products	Microsoft PowerPoint
9	Email Correspondence	Writing emails	Business email templates, concordance (open database)

### 2) Possible Medium of Instruction

Participants should be exposed to realistic English language contexts. It is strongly recommended to make use of authentic materials and situations in the workplace (Cheep-Aranai et al., 2017). The learners may be assigned to complete work-related tasks. The task-based approach can be a beneficial way to develop English skills of participants. Materials used depend on the specific purpose and situations required in each field. For instance, the executives tend to need presentation skills for business purposes, while operators are more involved with reading concerned texts such as manuals and notice.

Because of their time limitation, personal constraints, and the fact that some participants did not recognize the significant impact of English skills on their work promotion, learning autonomy should be promoted.

### 3) Learning Activity and Personal Preference

Self-learning through entertainment platforms should be emphasized. One of the interviewees (EN2) mentioned that, at their workplace, the company also considered providing employees with online learning packages at their convenience. Nonetheless, this alternative may not agree with employees, as they are required to pay an additional fee for the Internet service and electricity. The recommended tasks for developing oral skills of engineers include group meetings and public speaking.

### 4) Making Use of Language through Online Edutainment

Listening to songs, reading news, watching movies, using social media (e.g., Facebook, Line, Twitter and Instagram), online shopping, and playing online games are all interactive tasks requiring both the players' language repertoire and their digital literacy skills. During the learning process, online applications, such as Flinga and Kahoot, serve as alternative media allowing users to develop English vocabulary, grammar, and other language skills through enjoyable, interactive, and competitive experiences.

### *Suggested Guideline for Further Development*

The researchers suggest that learners should spend one hour maximum per day and on average three days a week for each unit. Besides the contents and materials,

successful self-learning requires support from the employees' organization, as well as their own motivation, intrinsic and extrinsic.

To sustain learners' motivation, self-evaluating tools, such as rating scales, pre/post-tests, mind-mapping, and checklist report, can be used. This means that the self-learning instruction should be given at the very beginning of the module and the pre-test should be employed to examine the learners' English proficiency background. Furthermore, teachers can play an important role to facilitate and give feedback to learners for learning development.

Nevertheless, the adult learners in workplaces may need to contact teachers via social media applications, instead of face-to-face communication, because of time limitations and transportation costs. These days, one of the popular online platforms (particularly among Thai users) is Line, which provides services in the forms of verbal texts, photos and animation, emoticons, files, video clips, and so on. These functions can appropriately serve as learning activities throughout the module. The researchers, therefore, recommend Line as a means of teacher-learner interaction during the self-learning period.

## **Conclusion**

The findings revealed that engineers, engineering operators, and administrative staff at Phra Nakhon Si Ayutthaya and Pathum Thani manufacturing companies needed to learn English language for general as well as work-related purposes relying on all four skills. Moreover, the learners' lifestyles involved with social media support their daily communication and self-learning. Meanwhile, their constraints relating to time, job demand, and finance influenced the participants' needs to learn English, either in or out of the workplace.

More importantly, learning activities should contain senses of fun and relaxation. These require public, audio-visual materials, such as video clips, songs, and movies on YouTube, English websites, and online games. The researchers suggest that the suitable module should include self-learning with available online tools and teachers as facilitators, while the learners are developing and self-assessing their English language performances. However, all of the contents and tasks need to be designed with regard to authenticity of language use in order to ensure learners' engagement and enhance their learning motivation.

## References

- Abraham, S. (2008). A need analysis on the engineering undergraduates' communication skills. *Academic Journal UITM Pulau Pinang*, 4(2), 163-184.
- Ayokanmbi, F.M. (2011). Competencies for global engineers and technologists. *Journal of Industrial Technology*, 27(1), 1-6.
- Boekaerts, M. (2016). Engagement as an inherent aspect of the learning process. *Learning and Instruction*, 43, 76-83. Retrieved from <http://doi.org/10.1016/j.learninstruc.2016.02.001>
- Board of Investment, Thailand. (February, 2019). IOT the next big thing in smart electronics. *Thailand Investment Review*, 29(2). Retrieved from <https://www.boi.go.th>
- Brown, J. D. (1995). *The elements of language curriculum: A systematic approach to program development*. Boston, MA: Heinle & Heinle Publishers.
- Cakir, H. (2013). Use of blogs in pre-service teacher education to improve student engagement. *Computers & Education*, 68, 244-252. <http://doi.org/10.1016/j.compedu.2013.05.013>
- Cambridge Assessment. (2019). *English language skills in the workplace*. Retrieved from <https://www.cambridgeenglish.org/why-choose-us/english-at-work/>
- Cheep-Aranai, R., Chutichaiwirath, K., Grubbs, S., & Brady, M. (2017). A comparison of industry English needs with university students' strengths. *Veridian E-Journal*, 10(4), 394-409
- Chenaksara, P. (2005). *Needs analysis for English communication skills of Thai Airways International cabin crew* (Unpublished master's thesis). Kasetsart University, Bangkok, Thailand.
- Clement, A., & Murugavel, T. (2015). English for employability: A case study of the English language training need analysis for engineering students in India. *English Language Teaching*, 8(2), 116-125. doi:10.5539/elt.v8n2p116.
- Crystal, D. (1997). *English as a global language*. Cambridge: Cambridge University Press.
- da Rocha Seixas, L., Gomes, A. S., & de Melo Filho, I. J. (2016). Effectiveness of gamification in the engagement of students. *Computers in Human Behavior*, 58, 48-63. doi:10.1016/j.chb.2015.11.021
- Department of Industrial Promotion. (2017). *Electric and electronic industry*. Retrieved from <http://strategy.dip.go.th>
- Dudley-Evans, T., & St John, M. J. (1998). *Developments in English for specific purposes: A multidisciplinary approach*. Cambridge: Cambridge University Press.
- Gibbs, R., & Poskitt, J. (2010). *Student engagement in the middle years of schooling (Years 7-10): A literature review*. Retrieved from [http://www.educationcounts.govt.nz/\\_data/assets/pdf\\_file/0010/74935/940\\_Student-Engagement19052010.pdf](http://www.educationcounts.govt.nz/_data/assets/pdf_file/0010/74935/940_Student-Engagement19052010.pdf)
- Han, J. H., & Finkelstein, A. (2013). Understanding the effects of professors' pedagogical development with Clicker Assessment and Feedback

- technologies and the impact on students' engagement and learning in higher education. *Computers and Education*, 65, 64-76. <http://doi.org/10.1016/j.compedu.2013.02.002>
- Hart-Rawang, P., & Li, L. (2008). Globalization and business communication: English communication skills for Thai automotive engineers. *World Academy of Science, Engineering, and Technology*, 24, 320-330.
- Hart-Rawang (2009) *International English language education in Thailand: English language program for Thai engineers*. A thesis presented for the requirement for the degree of Doctor of Philosophy. School of Global Studies, School of Science and Planning Portfolio of Design and Social Context. RMIT University.
- Hutchinson, T., & Waters, A. (1998). *English for specific purposes: A learning-centred approach*. Cambridge: Cambridge University Press.
- Jarupan, S. (2013). The English oral communication competency of Thai engineering students. *International Journal of Scientific and Research Publications*, 3(3), 1-9.
- Jordan, R. R. (1997). *English for academic purposes: A guide and resource book for teachers*. Cambridge: Cambridge University Press.
- Joungtrakul, N. (2013). Thai engineers' readiness to cope with the free flow of skilled labor in the ASEAN economic community. *HRD Journal*, 4(1), 6-21.
- Joungtrakul, J. (2018). The major challenges effecting human resource management in public universities in Thailand (in Thai). *Prae-wa Kalasin Journal of Kalasin University*, 5(2), 215-238.
- Kassim, H., & Radzuan, N. R. M. (2008). Resolving conflict: Enhancing engineering students' English fluency through workplace situation. *International Journal of Learning*, 14 (11), 51-60.
- Kaewpet, C. (2011). Learning needs of Thai civil engineering students. *The Asian ESP Journal*, 7(3), 79-105.
- Kosashunhanan, K. (2016). The use of English for communication by Thai engineers: Case study of Japanese companies at Amata Nakorn Industrial Estate. *Suthiparithat*, 30(93), 146-159.
- Laohachaiboon, S. (2011). *Intercultural communication obstacles in a Japanese company: A case study into cross-cultural effect and difficulties in English communication of Thai employees at Toyota Tsusho (Thailand) Co., Ltd* (Unpublished master's thesis). Thammasat University, Bangkok, Thailand.
- Long, M. H. (2005). *Second language needs analysis*. Cambridge: Cambridge University Press.
- Pandey, M., & Pandey, P. K. (2014). Better English for better employment opportunities. *International Journal of Multidisciplinary Approach and Studies*, 1(4), 94-100.
- Pathum Thani Provincial Industry Office (2019). *2019 Factory directory*. Retrieved from <http://www.industry.go.th/pathumthani/index.php>
- Pellas, N. (2014). The influence of computer self-efficacy, metacognitive self-regulation and self-esteem on student engagement in online learning

- programs: Evidence from the virtual world of second life. *Computers in Human Behavior*, 35, 157-170. <http://doi.org/10.1016/j.chb.2014.02.048>
- Pinprathomrat, P. (March 4, 2019). 9 RMUTs emphasize new curricular producing hybrid graduates to serve labor market demand and pleased with the cabinet budget approval for the new curricular. *RMUTT News*. Retrieved from <http://rmutt.ac.th>
- Phra Nakhon Si Ayutthaya Provincial Industry Office. (2019). *2018 Financial statement*. Retrieved from <http://www.industry.go.th/ayutthaya/index.php>
- Prachanant, N. (2012). Needs analysis on English language use in tourism industry. *Procedia-Social and Behavioral Sciences*, 66, 117-125. doi: 10.1016/j.sbspro.2012.11.253
- Rappa, A. L., & Wee, L. (2006). *Language policy and modernity in Southeast Asia: Malaysia, the Philippines, Singapore and Thailand*. New York: Springer.
- Raina, R., & Pande, N. (2012). Communication competence of India engineers in IT & ITeS sector. *The Indian Journal of Industrial Relations*, 47(3), 511-526.
- Tangprakun, R. (2010). *A survey of needs of engineering staff on English training program in an engineering company in Bangkok* (Unpublished master's thesis). Thammasat University.
- Rajprasit, K., & Pratoomrat, P., Wang, T., Kulsiri, S., & Hemchua, S. (2014). Use of the English language prior to and during employment: Experiences and needs of Thai novice engineers. *Global Journal of Engineering Education*, 16, 27-33.
- Reeve, J. (2012). A self-determination theory perspective on student engagement. In *Handbook of research on student engagement* (pp. 149-172). Boston, MA: Springer US. Retrieved from [http://doi.org/10.1007/978-1-4614-2018-7\\_7](http://doi.org/10.1007/978-1-4614-2018-7_7)
- Wanchid, R. (2007). *The effects of types of peer feedback and level of general English proficiency on writing achievement of KMITNB students* (Unpublished doctoral dissertation). Chulalongkorn University, Bangkok, Thailand.
- Wattansakulpusakorn, P. (1996). *Ability in using technical English of the engineering students of Rajamangala Institute of Technology* (Unpublished master's thesis). Kasetsart University, Bangkok, Thailand.