

The English Language & Communication in the International Workplace: An Examination of Thai Computer Engineering Professionals

KRICH RAJPRASIT

Srinakharinwirot University

Thailand

krich@g.swu.ac.th

SAENGCHAN HEMCHUA

Srinakharinwirot University

Thailand

ABSTRACT

Using effective English language is one of the most desired communication skills for successful international engineering workplace. However, the way in which this language is used in terms of computer engineering has not been much studied, despite being one of the key aspects of international business. This study aims to explore the nature of international communicative situations; to identify how Thai engineers self-report their language proficiency, ability to perform English-related tasks and their opinions regarding language use in an international workplace. The participants were Thai engineers working in companies located in the Bangkok metropolitan area. A mixed-methods approach was employed, and the results revealed that English language proficiency plays a key role in their workplace and in terms of career advancement; their interpersonal communication mostly took place between colleagues in the same base, or between overseas bases, in terms of cooperation, teamwork, and meetings; oral communication skills were the most needed; their perceived language proficiency level was fair, and their perceived reading skills were the best in comparison to their other skills; and using perfect English was not a priority, yet intelligibility was more important for reaching their communicative goals. Such findings have led to pedagogical implications such as specifically designing courses containing realistic knowledge and skills; introducing the concept of BELF to raise awareness among engineering students regarding comprehensibility of non-native-like English speech; and practicing listening with both native and non-native accents to be familiar with these accents and more confident communicating in real-life situations.

Keywords: English language proficiency; communication skills; Business English as a Lingua Franca; Thai computer engineers

INTRODUCTION

Professional engineers are men and women who use technology as a means to enhance elements such as cost-effectiveness or market-competitiveness (Samson 1989). In the case of computer engineers, the nature of their profession is to analyse, design and evaluate computer systems in terms of both hardware and software. Additionally, computer engineers also work on the planning, design, development, testing, and even the supervision of manufacturing computer hardware, as well as the networks that transmit data and multimedia (Berry, DiPiazza & Sauer 2003). However, like any other profession, computer engineering also requires interpersonal communication, mostly in the form of oral communication, and employs English as a *lingua franca* at the international level (Louhiala-Salminen, Charles and Kankaanranta 2005, Reimer 2002, Seidlhofer 2011, Spence and Liu 2013).

Due to the aforementioned situation, a global computer engineer is obliged to possess the ability to communicate across national and cultural boundaries with ease. In this way, the English language can be seen as a facilitating language, which allows engineers to achieve their communicative goals. For this reason, English language proficiency is vital for global computer engineers, from participating in the international professional arena and reaching a desirable position in terms of a career path, for example, job recruitment, routine work,

promotion and advancement. Therefore, a qualified engineer does not need only technical skills, but communication skills as well (Arkoudis et. al. 2014, Cole and Tibby 2013, Kanoksilapatham 2013, Thanky 2014). In the international workplace, engineers also deal with various communicative situations in both interpersonal and organisational terms, which require a specific set of communication skills among both native and non-native English speakers who are clients, contractors or suppliers, or colleagues, supervisors, and subordinates. In such a context, interpersonal interaction frequently occurs in oral and written communication. Specifically, communicative situations for engineers usually cover tasks such as work-related discussions, informal and social conversation, persuasion and negotiation (Apelman 2010, Ayokanmbi 2011, Reimer 2002, Spence and Liu 2013).

Moreover, the notion that non-native English language users have to attain the 'perfect' level of English that native English speakers are believed to speak, is not a primary consideration in terms of success in the globalised professional context any more (Kankaanranta 2010, Louhiala-Salminen and Kankaanranta 2011) Rather, comprehensibility seems to be the key focus among these language users in terms of achieving particular goals, particularly among non-native English speakers. This also resulted in the concept of Business English as a Lingua Franca (BELF) (Louhiala-Salminen, Charles and Kankaanranta 2005).

While effective English communication in the workplace is largely based on individual and organisational factors, it has been noted by academicians and industry professionals alike that new global engineers suffer from a knowledge-gap in terms of the outcomes of an engineering education and the demands of engineering in practice. In other words, a lack of communication in the workplace, as well as a lack of management skills, has been widely reported. The research on English language proficiency and workplace communication, conducted in national and international contexts, revealed that engineers, in particular, non-native English speakers, encountered difficulties in terms of English workplace communication, sometimes to the extent that their employers were dissatisfied with the communication skills of new engineering graduates. It has also been noted that the language proficiency levels and communication skills of engineers were in urgent need of improvement (Johnson, Lee and McGregor 1996, Khamis and Ho-Abdullah 2015, Raina and Pande 2012, Rajprasit, Pratoomrat, Wang, Kulsiri and Hemchua 2014, Rajprasit, Pratoomrat and Wang 2015, Ruff and Carter 2009, Thanky 2014).

As the available research on the topic of the English language and workplace communication in a Thai computer engineering field is rare, the present study has made an effort to explore the nature of communicative situations in an international computer engineering workplace, to identify the levels of self-reported English language proficiency, and the ability to perform English-related tasks in this field. As previously mentioned, the factor of globalisation directly affects engineering in terms of both education and the professional aspect. Thus, educational institutes have to be ready and able to face such a challenge. Knowledge of the nature of communicative situations, and self-reported levels of English proficiency levels and abilities could be beneficial for specifically redesigning the English for Specific Purposes courses for computer engineering undergraduates, and novice computer engineers in language training courses.

LITERATURE REVIEW

INTERNATIONAL WORKPLACE COMMUNICATION IN THE ENGINEERING PROFESSION

According to Kress (1985), who attempted to define the role of organisation in workplace communication, social institutions produce specific ways of writing or talking about certain

areas of social life, which are related to the place, the time, and the nature of the institution, and produce statements which define what is possible and impossible to say, and how it is to be talked or written about within each professional context. From the perspective of Bandura (2008), communication in organisations can be socially learned, taught, and further improved through organisational training programs. Keyton, Caputo, Ford et. al (2013) maintain that communication is related to and productive to intentional, interactive, learnable and observable outcomes.

In addition, interpersonal communication is necessary for any organisation, as it takes place in a context bound by formal and informal workplace relationships, as well as larger societal and organisational cultures. Globalisation and the use of technology have also put a greater emphasis on the interpersonal skills of employees, and their ability to collaborate in teams. In the international workplace communicative setting, interpersonal interaction constantly occurs, whether individually, as a result of teamwork, and small-group meetings. Thus, communication always appears high on the list of the most desirable skills sought by employers, and it is not surprising that employers rank oral communication skills among the top three most valuable applied skills. However, employers have rated almost all new engineering graduates at largely deficient levels (Mohamed et. al. 2014, Raina & Pande 2012, Rajprasit, Pratoomrat & Wang 2015, Ruff & Carter 2009, Thanky 2014).

Apparently, oral communication (oral presentation, group discussion, negotiation, socialisation among colleagues, and persuasion) and written communication (i.e. project reports, emails, meeting minutes, and presentation slides) frequently occur in the context of the international workplace (Apelman 2010, Ayokanmbi 2011, Reimer 2002, Spence & Liu 2013). However, oral communication skills have been prioritised by employers, across a variety of disciplines, for over a decade. Even though knowledge and technical know-how are obviously significant, they must be presented orally, and with an excellent standard of communication skills. In terms of enhancing such skills, various methods (i.e. presentations; group projects; peer review; role-play; video feedback; and the use of presentation software/hardware) are employed in the language classrooms and training courses (Keane & Gibson 1999).

In the study by Keyton et. Al (2013), the ten most common communication behaviors in U.S. business operations and workplaces were identified, as follows: listening, asking questions, discussion, sharing information, agreeing, suggesting, getting feedback, seeking feedback, answering questions, and explaining. Even though such behaviours are not restricted by level, or whether they are a supervisor or a subordinate, and job type, a general way to operationalise communicative competency in the workplace would be to focus on verbal communication behaviours.

Therefore, in order to be a successful engineer, and in particular, a computer engineer, the following communication abilities have been suggested to improve their English communication skills:

1. the ability to design communication (e.g. evaluating communication situations and designing communication appropriately for different contexts and purposes, and communicating effectively to a variety of audiences)
2. the ability to explain something clearly (e.g. presenting information in a way that goes beyond the specific details of a project to provide the big picture, a higher level of summary, and explaining the codes, methods, and design decisions by communicating their intentions)
3. the ability to have a productive discussion (e.g. leading a productive group discussion and dealing constructively with conflict)

4. the ability to receive communication (e.g. listening actively and asking clarifying questions)
5. the ability to communicate professionally (e.g. giving opinions with a balance of confidence and humility, and avoiding complaining)
6. the ability to use common forms and tools (e.g. demonstrating a mastery of the kinds of formal and informal communication most often used in the industry, and using digital tools that are beneficial in terms of communication and teamwork (Reimer 2002, Ruff & Carter 2009).

As a result, the key factor is the ability of the engineers to speak English or have English language proficiency in the international communicative setting, in which such a degree of proficiency can be regarded as the key to individual and institutional success.

THE LEVEL OF ENGLISH LANGUAGE PROFICIENCY REQUIRED FOR INTERNATIONAL ENGINEERS

English language proficiency is a key requirement for engineers, ranging from participation in the professional arena to reaching a desirable position in terms of their career path, and in particular, international professions. English language proficiency also offers a tremendous advantage in terms of the employability of graduates who are willing to work overseas, or for international organisations within their own country (Arkoudis et. al. 2014, Cole & Tibby 2013, Knight & Yorke 2004).

The need for a truly international language has become even more pressing, especially in light of the NATO agreement on standardised technical language, which can be regarded as the advent of an already-emerging global communication system (Johnson, Lee & McGregor 1996). If engineering is to be successful in regaining a position where its professional expertise can be best employed, it must develop a discursive competence adequate to deal with the increasingly complex social environment in which it operates (Johnson, Lee & McGregor 1996). Therefore, several sets of the communication skills required for engineers have already been examined in the contexts of communication and documentation, and engineers are increasingly being called on to explain, justify, argue, or persuade. Thus, the area of research is English language proficiency with the following attributes: spoken language fluency; written language fluency; regional and national dialects; technical terminology and professional jargon (Reimer 2002).

Thus, to a large extent, English is used as an operational language allowing communication and co-operation between people from different places and language groups to take place as usual (Latha 2014). In order to reach a communicative goal in terms of the operations aspect of business, some business communication scholars have proposed a number of innovative concepts, one of which is Business English as a Lingua Franca (Kankaanranta 2009, Louhiala-Salminen, Charles & Kankaanranta 2005).

BUSINESS ENGLISH AS A LINGUA FRANCA

As a result of the present era of globalisation, and increasing interaction amongst professionals, the English language is a definite requirement for successful professional communication, and has been shifted from its role as an everyday form of communication to a professional language (Welch, Welch, & Piekkari 2005). According to Kankaanranta (2009), this type of language is typically the corporate language of multinational companies, and used for corporate functions, for example, accounting, communications, finance, and management. Therefore, the increasing use of the English language in these international; business situations has resulted in the framing of the concept of Business English as a Lingua

Franca (BELF). BELF was proposed by the scholars in the area of business communication over the last decade, and Louhiala-Salminen, Charles and Kankaanranta (2005, pp. 403-404) have defined BELF as:

English used as a 'neutral' and shared communication code. BELF is neutral in the sense that none of the speakers can claim it as her/his mother tongue; it is shared in the sense that it is used for conducting business within the global business discourse community, whose members are BELF users and communicators in their own right – not 'non-native speakers' or 'learners.'

Even though some scholars (Gerritsen & Nickerson 2009) pointed out that the use of BELF may lead to communication problems such as a lack of comprehensibility, cultural differences and stereotyped associations, Seidlhofer (2011) argued that regardless of the influence of English native speakers, (Business) English as Lingua Franca is characterised as a tool to reach a communicative goal and for international intelligibility among speakers of different first languages.

Recent studies on BELF conducted worldwide have highlighted its key role in terms of successful international communication. In Evans (2013)'s study on the use of English as a business lingua franca in key service industries in Hong Kong, it was reported that English can be considered as one element in the linguistic ecology of the contemporary workplace. He also emphasised the significance of written English communication, even if the nature and the extent of such use are due to a variety of institutional and individual factors. Spoken English also plays a vital role in foreign organisations in Hong Kong, as video and telephone conferencing are frequently used by local professionals, and there is also interplay between written and spoken codes in both English and Chinese in terms of workplace communication. More interestingly, the focus in this form of communication is not on the most correct form of language, and nor are they introduced to the standard business communication textbooks which focus on the most stylistically appropriate form of language. Asininity (2007) discovered that engineers who were members of the Paper Engineers Association of Finland used English in daily workplace communication with a large number of non-native English speakers. Most of them used spoken English in interactive situations, and spoken English situations occurred more frequently than written ones. In addition, spoken skills played a more important role in problematic situations than written skills. However, one of the most challenging aspects for the non-native English speakers was to understand a variety of different pronunciations of spoken English.

In order to compare the preferable use of Standard English and BELF, Suryani, Desa, and Yaacob (2010) conducted several cross-border activities as part of a collaborative project among Malay students (English as a Second Language user) and Thai students (English as a Foreign Language user) at the university level. They found that the Malay students used a variation of Standard English for formal situations, and used BELF for informal situations. However, the Thai students used BELF for both formal and informal situations. In addition, the Thai students tended to use BELF for both formal and informal occasions, as a method of getting the message across or 'getting the job done' regardless of their accuracy in spoken English.

RESEARCH QUESTIONS

The research questions to be addressed are as follows:

1. How necessary is English language proficiency for Thai computer engineers?

2. How often do Thai computer engineers engage in interpersonal communication in English?
3. What kinds of English communicative situations do Thai computer engineers encounter most frequently?
4. How do Thai computer engineers self-rate their general English language proficiency, and abilities in terms of performing English-related tasks?
5. What are the opinions of Thai computer engineers regarding English communication in the workplace?

RESEARCH DESIGN

PARTICIPANTS

This study employed a mix-methods approach with a total of 40 participants. These participants consisted of Thai operative engineers working for international companies in the Bangkok metropolitan area, with headquarters located in Norway, the United Kingdom, and the United States of America. The criteria for selecting these participants was that they were working in computer engineering at an operative level, their company was medium-sized, with at least 500 to 1,000 employees, and they had up to 10 years of work experience after university graduation. Furthermore, four of the participants who worked in Thailand willingly took part in individual interviews in order to provide more information regarding English communication in their workplace.

INSTRUMENTS

The instruments were developed from previous studies, and there were two instruments used to collect data in this study, a questionnaire, and a series of interview questions.

QUESTIONNAIRE

The questionnaire consists of seven parts as shown below.

- Part 1 - demographic information
- Part 2 - 3 questions on the necessity of English language proficiency in the workplace
- Part 3 - 7 questions on the frequency of their interpersonal communication in English
- Part 4 - 16 questions on the frequency of English communication in the workplace
- Part 5 - 24 questions on perceptions of level of English language
- Part 6 - 22 questions on their perceptions regarding their abilities to perform English-related tasks in the workplace
- Part 7 - a one-week record of English communication in the workplace.

In parts two to four, the questions were adapted from Spence and Liu's study (2013) concerning needs analysis for Engineering English at a Taiwanese semiconductor manufacturing company. In part five, the questions regarding their self-perceived levels of English language proficiency were applied from Taillefer's study (2007) on the assessment of, and perspectives on the professional language needs of French economics graduates. The proficiency level descriptors on the Test of English for International Communication (TOEIC) correspond with the Common European Framework of Reference for Languages (CEFR), a guideline used across Europe to describe the achievement levels of learners of foreign languages. The six proficiency levels of TOEIC correspond with the six levels of CEFR, as follows: level 1 (novice) = A1 (beginner), level 2 (elementary) = A2 (elementary),

level 3 (basic working proficiency) = B1 (intermediate), level 4 (basic working proficiency) = B2 (upper intermediate), level 5 (advanced working proficiency) = C1 advanced, level 6 (general professional proficiency) = C2 (proficiency).

Thus, Taillefer's set of questions, which rank each language skill from one to six (reading, listening, writing, and speaking) correspond with TOEIC level descriptors. In part six, the questions about their ability to perform tasks were adapted from Hart-Rawung and Li's study (2008) on the English communication skills of Thai automotive engineers.

Regarding the scoring of each part, in parts two to six, each item or question was scored on a four-point scale with numerical values to show the level of necessity of English language proficiency (1 - low, 2 - quite low, 3 - quite high, 4 - high) and in part two, to indicate the frequency of interpersonal communication, and dealing with communicative situations in English (1 - never, 2 - sometimes, 3 - often, 4 - always) in parts three and four, and to show their perceived language proficiency level, and their ability to perform English-related tasks (1 - poor, 2 - fair, 3 - well, 4 - excellent) in parts five and six. The last part is the one-week record of English workplace communication. In this part, the respondents were asked to record the English communicative situations that occurred during a single working week.

INTERVIEW QUESTIONS

The interview questions asked the engineers to express their opinions toward significance of engineering knowledge and English language proficiency, factors affecting engineering career advancement (i.e. engineering knowledge and English language proficiency), nature of English workplace communication, interpersonal communication in English and challenges encountered in communicative situations. These queries were set in an open-ended format, and based on the findings of the quantitative data and previous studies.

Both instruments were written in the English language, as the participants used it as a medium of communication in the workplace. In order to confirm the validity of the content, both instruments were sent to experts for revision. A pilot study was conducted with ten electronic engineers from different companies to ensure the reliability of the questionnaire. The Cronbach's alpha coefficients of parts 2 to 6, ranged from .759 - .974.

DATA COLLECTION AND ANALYSIS

After receiving permission to collect data from four international companies in the Bangkok metropolitan area, the present study was conducted at the end of 2014. The participants were given an introduction to the research and the research objectives, and were also asked whether they were willing to respond to the questionnaire. Then the questionnaire was administered to 40 computer engineers with the assistance of research assistants over a period of two weeks. All 40 engineers returned the completed questionnaires, and one-on-one interviews with four of the engineers were conducted a month after the questionnaire was first distributed.

SPSS for Windows, version 16.0, was used for all statistical analyses, using descriptive statistics, including frequencies, means, standard deviations, and percentages. The data from the four one-on-one interviews were transcribed and studied in order to develop common themes regarding the opinions of these engineers regarding English workplace communication in their companies.

FINDINGS

In this section, the quantitative and qualitative data are presented, as well as the research questions.

QUANTITATIVE DATA

TABLE 1. The Necessity of English Language Proficiency at Work

Necessity of English language proficiency	Mean	SD	Level
1. Job recruitment	3.13	.751	high
2. Routine work	3.00	.762	high
3. Job promotion and/or advancement	3.31	.535	high
Overall	3.15	.568	high

The data above report on the necessity of English language proficiency in the engineering workplace. The electrical engineers in this study agreed that the language proficiency is highly required for job recruitment, routine work and job promotion and/or advancement. In other words, such proficiency seems to play an important role in those engineers' workplaces.

TABLE 2. Frequency of Interpersonal Communication in English

Interpersonal communication in English	Mean	SD	Frequency
1. Clients	2.28	.851	sometimes
2. Thai colleagues	2.16	1.167	sometimes
3. Foreign colleagues based in Thailand	3.06	1.014	often
4. Foreign colleagues based in other countries	2.66	1.260	often
5. Supervisors/superiors	2.44	1.050	sometimes
6. Subordinates	2.09	1.146	sometimes
7. Suppliers/contractors	2.09	1.170	sometimes
Overall	2.40	.849	sometimes

In Table 2, the frequency of interpersonal communication in English (clients, Thai colleagues and foreign colleagues based in Thailand) is reported. The data shows that interpersonal communication in English, between engineers and their foreign colleagues, based in both Thailand and other countries is frequent with means of 3.06 and 2.66 respectively.

TABLE 3. Frequency of English Communicative Situations

English communicative situations	Mean	SD	Frequency
Among colleagues in the same department			
1. Discussing work-related matters informally	2.63	.793	often
2. Persuading colleagues	2.34	.937	sometimes
3. Giving feedback on colleagues	2.34	.827	sometimes
4. Conversing informally and socially	2.69	.896	often
5. Following instructions/directions from colleagues	2.42	.807	sometimes
6. Building relationships	2.59	.875	often
7. Instructing, explaining and demonstrating	2.50	.879	sometimes
Overall	2.51	.760	sometimes
At the meeting			
1. Conducting oral presentations	2.50	.916	sometimes
2. Leading discussions and exchanging opinions	2.25	1.047	sometimes
3. Participating in discussions and exchanging opinions	2.53	1.016	sometimes
4. Persuading other participants	2.31	.931	sometimes
Overall	2.40	.909	sometimes
During working in a team			

1. Building relationships among colleagues	2.66	.971	often
2. Conversing informally among colleagues	2.69	1.029	often
3. Solving conflicts among colleagues	2.22	.941	sometimes
4. Negotiating with colleagues	2.47	.915	sometimes
5. Persuading colleagues	2.47	.950	sometimes
Overall	2.50	.880	sometimes
English communicative situations	2.48	.783	sometimes

The data shown in Table 3 reveal how often the engineers encounter English communicative situations in their workplace (among colleagues, at meetings, and working in teams). Communication among colleagues in the same department was the most likely to happen (2.51). With regard to the sub-items, the three English communicative situations that occurred most frequently in international workplaces included conversing informally and socially in the same department (2.69), conversing informally among colleagues in a team (2.69), building relationships among colleagues in a team (2.66), and discussing work-related matters informally (2.63) and building relationships with colleagues in the same department (2.59) often take place in the workplace.

TABLE 4. Self-report on English Language Proficiency

Self-report on English language proficiency	Mean	SD	Level
Reading ability	2.78	.792	good
1. Reading simple words and phrases used in everyday life			
2. Reading short, simple texts for the gist or specific information	2.81	.821	excellent
3. Reading texts written in everyday language, or relative to my studies, at a rather slow pace	2.44	.878	fair
4. Reading articles or reports with a particular point of view, as long as there is adequate time	2.56	.840	good
5. Reading longer, complex, and more specialized texts; and able to appreciate differences in style, and in a reasonable time frame	2.44	.948	Fair
6. Reading any type of text easily, even abstract or complex documents; and able to appreciate subtle distinctions in style, and implicit and explicit meanings	2.25	1.050	fair
Overall	2.55	.702	good
Listening ability			
1. Understanding words, and basic, familiar expressions in a limited context	2.84	.723	good
2. Understanding expressions and common vocabulary relative to my immediate environment	2.75	.718	good
3. Understanding key points in clear, standard speech when people speak slowly on familiar topics	2.72	.888	good
4. Understanding longer talks and following complex lines of argument on familiar topics; an understanding of most news programs in standard dialect	2.16	.847	fair
5. Understanding extended speech, even when it is not clearly structured, and TV programs, with a relative degree of ease	2.16	1.02	fair
6. Understanding any kind of spoken language, whether broadcast live or prerecorded, as long as I have time to become familiar with a particular accent	2.41	.945	fair
Overall	2.51	.713	fair
Writing ability	2.78	.792	good
1. Writing notes on short and specific pieces of information			
2. Writing short and simple notes and messages	2.81	.821	good
3. Writing coherent texts or notes on familiar subjects	2.71	.902	good
4. Writing clear and detailed texts, reports and essays on topics in my field	2.38	.976	fair
5. Writing clear, well-structured texts, and developing my point of view on complex subjects	2.12	.975	fair
6. Writing clear, smoothly flowing and stylistically appropriate prose; able to write summaries or critical reviews	2.16	.954	fair
Overall	2.51	.750	fair
Speaking ability	2.69	.738	good

1. Saying basic expressions, phrases and asking simple questions on familiar subjects, as long as my interlocutor is willing to help me understand and express myself			
2. Responding to familiar topics, such as describing my job in simple terms, and carrying on a very limited conversation	2.63	.751	good
3. Generally explaining my opinions or projects; spontaneously participating in conversations on familiar topics	2.38	1.040	fair
4. Expressing myself clearly and in detail, actively participating in conversations on topics relative to my interests; spontaneously communicating with a native speaker	2.34	1.004	fair
5. Describing complex subjects clearly and in an appropriate manner; expressing myself spontaneously, clearly and easily in either professional or social contexts	2.28	1.020	fair
6. Describing or arguing complex subjects clearly, easily, and in an appropriate manner; expressing myself in any situation in standard, idiomatic language with the appropriate nuances; correcting my mistakes in a natural way which draws little notice	2.19	1.090	fair
Overall	2.42	.814	fair
Self-report on English language proficiency	2.49	.694	fair

In Table 4, self-report of English language proficiency (i.e. reading, listening, writing and speaking abilities) is shown. Obviously, the engineers perceived that their levels of English language proficiency were at a fair level. However, their reading ability seemed to be better, at least in comparison to their other skills. Considering that each ability ranged from level 1 (novice) to 6 (general professional proficiency), these engineers tended to perform better in the first three levels, described as novice (beginner), elementary, and basic working proficiency (intermediate), based on the proficiency level descriptors of both CEFR and TOEIC (Taillefer 2007).

TABLE 5. Self-report on Performance of English-related tasks

Self-report on performance of English-related tasks	Mean	SD	Level
Reading tasks			
1. Reading instructions on how to perform job	3.13	.492	well
2. Reading equipment manuals	3.13	.554	well
3. Reading project reports	2.91	.734	well
4. Reading official documents	3.06	.619	well
5. Reading engineering-related articles	3.00	.672	well
Overall	3.04	.492	well
Listening tasks			
1. Understanding instructions on how to perform job	2.81	.535	well
2. Understanding key information when attending international conferences/ seminars	2.50	.762	fair
Overall	2.66	.874	well
Writing tasks			
1. Writing E-mails	3.03	.647	well
2. Writing meeting minutes	2.69	.859	well
3. Writing logbooks	2.72	.851	well
4. Writing project proposals	2.66	.787	well
5. Writing project reports	2.44	.878	fair
6. Writing business letters	2.53	.950	well
7. Writing memos	2.97	.740	well
8. Writing presentation slides	2.84	.808	well
Overall	2.73	.627	well
Speaking tasks			
1. Making oral presentations	2.66	.745	well
2. Participating in conferences/seminars	2.50	.718	fair
3. Engaging in business interactions	2.53	.842	well
4. Talking about routine work and tasks	2.84	.723	well
5. Participating in a teleconference	2.53	.671	well
6. Responding on the telephone	2.69	.780	well
7. Engaging in informal and social conversations	2.97	.782	well
Overall	2.67	.627	well
Self-report on performance of English-related tasks	2.78	.513	well

The data in the table above show the engineers’ self-report on their performances of English-related tasks (i.e. reading, listening, writing, and speaking tasks). Evidently, those engineers perceived that they performed English-related tasks well in the engineering workplace. However, they tended to perform English-related reading tasks the best of all (3.04). These findings are also relevant to those in Table 4, in that the reading ability of these engineers were perceived to be comparatively better than their other English abilities.

TABLE 6. A One-Week Record of English Workplace Communication

Productive skills		Receptive skills	
Speaking	Writing	Reading	Listening
- Performing oral presentations	- Writing emails to communicate with both Thai and foreign colleagues	-	-
- Explaining information about product requirements	- Writing product requirements as a reference for the team		
- Talking on the phone			
- Talking with colleagues about work-related issues			
- Providing ideas in a meeting			
- Talking with colleagues about general topics			

In Table 6, the engineers’ one-week record of English workplace communication (productive and receptive skills) regularly used at work is shown. Typically, the productive skills (speaking and writing) seem to be more required during their work day. Also, speaking skills are likely to be more essential in terms of completing routine work. However, receptive skills (listening and reading skills) were not reported as being used as part of their typical workplace communication. It may be assumed that the engineers felt challenged when asked to speak and write as such skills require individual mastery. They have to create and deliver their own ideas and messages to their interlocutors in spoken and written forms.

QUALITATIVE DATA

In this section, the data from the one-on-one interviews with four engineers, who replied the five open-ended questions, is reported. The engineers’ responses were transcribed and studied in order to develop common themes regarding the opinions of these engineers regarding English workplace communication in their companies.

THE SIGNIFICANCE OF ENGINEERING KNOWLEDGE AND ENGLISH LANGUAGE PROFICIENCY

A variety of organisations have formed individual professional settings in which domain specific knowledge and English language proficiency plays a vital role.

English communication skills seem to be more important than technical skills in an organisation in which the employees come from a diversity of cultural and linguistic backgrounds. (Engineer 1)

Employees with language skills may make communication easier, move things forward more quickly, and create a better reputation for their company. (Engineer 4)

However, the specific characteristics of job roles tend to require a different type of language proficiency.

In the case of developers or testers, language skills are typically used less compared to technical skills. When some help with communication was required, assistance from colleagues, team members, or supervisors/superiors was obtained. Additionally, for support staff, product or technical account managers, as well as managers who need to communicate with customers or international teams, language and technical skills were considered equally important. (Engineer 2)

THE FACTORS AFFECTING ENGINEERING CAREER ADVANCEMENT: ENGINEERING KNOWLEDGE AND ENGLISH LANGUAGE PROFICIENCY

Clearly, in the case of international organisations that require communication between stakeholders, both technical knowledge and language proficiency are necessary in terms of career advancement.

As promotions create more responsibility and collaboration, language skills become increasingly important as clear communication, such as directions, are communicated in the same language among team members. (Engineer 2)

With increased coordination between team members, other teams, and even shareholders from multiple nationalities, the more frequently communication occurs. (Engineer 3)

THE NATURE OF ENGLISH WORKPLACE COMMUNICATION: ENGINEERING ENGLISH AND GENERAL ENGLISH

The use of English in workplace communication consists of both engineering English and general English, as the context of such communication involves everyday life and professional communication.

Both general English and technical terms from engineering English were employed in order to answer questions from customers about products, participate in development team meetings, and perform product planning presentations. (Engineer 4)

However, the type of the language most frequently used depends on each communicative situation.

General English was typically used to explain basic requirements to developers, while engineering or geological English was mostly employed to discuss requirements with shareholders. (Engineer 2)

INTERPERSONAL COMMUNICATION IN ENGLISH: THE HOW AND THE WHO

The opportunity to communicate in English in interpersonal terms is limited by job role or position.

Communication with foreign colleagues based in other countries frequently took place. In addition, keywords or key sentences indicate an achievement in terms of communication. (Engineer 1)

The focus of interpersonal communication was to convey messages to counterparts with an emphasis on the bottom line, or the simple communication of a message. (Engineer 3)

Using direct and clear sentences was more important than using fancy words, and having a so-called 'perfect' accent was abandoned in an effort to increase understanding between interlocutors. (Engineer 4)

THE CHALLENGES ENCOUNTERED IN COMMUNICATIVE SITUATIONS

Between colleagues, the demonstration, explanation and instruction of tasks in English seem to be a significant challenge.

Developers with a background in computer science or computer engineering typically developed software related to geology, petrophysical engineering, and the fundamentals of reservoir engineering. Sometimes, they experienced difficulties achieving such tasks. Thus, explaining all engineering theories to them in English in limited period of time is not easy as understanding those theories requires more than 5 years at the undergraduate level. Furthermore, providing feedback to colleagues was very challenging as it dealt with both their language skills and psychological issues. (Engineers 3)

In terms of the kind of language used in meetings, the Thai engineers experienced difficulty with skills such as leading a discussion, and sharing their opinions.

As a non-native English speaker, the individual leading the meeting did not have to use English at a high level in order to impress the other participants. Additionally, talking to team-members and other colleagues in informal rather than formal English may be more appropriate, especially in terms of achieving their business goals, which are the true aim of such meetings. (Engineer 2)

Persuading other participants in a meeting in English was a real challenge for most of the participants, most of the time, especially as many native English speaking colleagues also attend these meetings, and may speak English rather quickly. It was also challenging for the participants to find a gap in order to speak up and convince others of their ideas. Thus, there is a need for a well-prepared document recording their expressions and speech during meetings, otherwise such content might be ignored or lost. (Engineer 3)

While working as a member of a team, the other challenge is to solve any conflicts that may arise between colleagues in English. As subjects that cause conflict are often sensitive, engineers with a limited ability to communicate may tend to exacerbate such conflicts, especially if they have to interact with native English speaking engineers. Therefore, a careful use of the language is required when a conflict needs to be resolved. (Engineer 4)

DISCUSSION

The present study aimed to investigate how Thai computer engineers typically perform in international communicative situations, and to identify the ways in which these engineers perceive their own English language proficiency, ability to perform English-language related tasks, and their opinions on workplace communication in the English language in the companies that they currently worked for.

First of all, Thai computer engineers were unable to deny the fact that English language proficiency played a vital role in workplace communication because language proficiency was a job requirement, and that they had been screened in terms of their domain-specific knowledge and skills, and their ability to communicate in English. There were more communication challenges identified in their routine work, as well as advancement in terms of their career path, and the opportunity for promotion. The results of the present studies were also consistent with other studies (Apelman 2010, Ayokanmbi 2011, Mohamed et. al. 2014, Raina & Pande 2012, Rajprasit, Pratoomrat & Wang 2015, Reimer 2002, Ruff & Carter 2009, Spence & Liu 2013, Thanky 2014). From the viewpoint of outsiders, it may seem that computer engineers do not need to communicate as frequently in English as they are supposed to, as they mainly deal with computer-related tasks. However, in reality, the engineers who participated in the present study have proved that such viewpoints are false. Besides which, the communication skills that they actually require, typically include the following: discussions, explanations, formal and informal conversations, as well as making oral presentations, negotiation, persuasion, problem-solving and conflict-resolution, as they mainly have to deal with interpersonal communication, similar to what Keyton et. al (2013) have confirmed in their research, even though the frequency of using such skills depends on the nature of each professional area. More interestingly, employing such skills actually challenges these Thai engineers to communicate in English in their workplaces in order to transfer information and technical knowledge through a common language (Reimer 2002, Ruff & Carter 2009).

Secondly, with regard to their English language proficiency, the computer engineers perceived themselves as being at a fair level. According to the six proficiency level descriptors of both CEFR and TOEIC tests (Taillefer 2007), these engineers perceived that

they were at level 3 (basic working proficiency) which corresponds with B1 (intermediate). In terms of their perceived ability to performing work-related tasks, their reading skills were more advanced than their other English language skills. These perceptions seemed reliable, as according to the CEFR descriptor, the language proficiency level of a university graduate should be at least at a B1 level. Even though perceived language proficiency may not assess actual language proficiency, because factors such as reliability and validity are not comparable to those of a standardised test, such as the TOEIC. McCroskey and McCroskey (1988) claimed that self-reporting seemed to be a practical way of assessing how competent a person thinks they are, as opposed to how competent they actually are. This kind of self-assessment is practical in terms of judging the readiness of learners in terms of their commitment to improvement and so on.

Finally, the opinions of some engineers regarding workplace communication in English were of particular interest because EFL speakers had identified the actual priority of workplace communication is intelligibility, rather than the use of so-called 'perfect' English. These findings were also consistent with the key concepts of BEFL (Kankaanranta 2009, Louhiala-Salminen, Charles & Kankaanranta 2005), and also consistent with the findings of Desa, Suryani, and Yaacob (2010), which concluded that Thai EFL speakers used BELF for both formal and informal situations for the purpose of getting their message across and getting the job done, rather than focusing on accuracy in terms of their spoken English. These engineers were also more likely to support such an idea as they were both non-native English speakers and technical rather than linguistic experts. Thus, setting the main learning objectives of English language courses for engineering students should be based on real-world workplace situations for strategically effective communication and accuracy, while the appropriateness of the language structure and its correct usage may be relegated to a secondary priority (Evans 2013, Suviniitty 2007).

CONCLUSION

This study highlighted the significance of the role of the English language in terms of international workplace communication in the field of computer engineering, and reflected what Thai computer engineers experienced and how they felt about international communication through the medium of the English language. The increasingly high demand for high-level communication skills among the computer engineers examined in the present study includes skills such as the ability to work effectively in teams, not only with other professional engineers, but across academic disciplines and corporate hierarchies. Therefore, effective workplace communication through the English language is a key for organisational and professional success, while the lack of effective communication skills tended to have a negative influence on the job performance of engineers who deal with the international clients and colleagues. In other words, technical knowledge is no longer sufficient in terms of their job requirements.

According to the main findings, some pedagogical implications are suggested. For example, researchers in the area of the English for Specific Purposes (ESP), such as engineering educators, and other stakeholders, have confirmed that in order to successfully operate on a global scale, the engineers of the future will need to be bilingual, at least, and use English effectively as a language of international communication. Firstly, there should be English for computer engineering courses at the tertiary level (i.e., English Fundamentals for Socialisation, Engineering Report Writing, Presentation Skills, Engineering Communications). This should be specifically developed as the nature of workplace communication seemed to differ from other engineering fields, and oral and written

communications were reported as mostly taking place in their professional life (i.e., between colleagues working in the same department, in meetings, or while working as a member of a team) The establishment of such specifically designed courses would equip engineering students with more realistic knowledge and language skills, which are urgently required in their professional lives. More significantly, these courses could be offered to students continuously throughout their tertiary education.

Secondly, the concept of BELF should be introduced to engineering students as non-native English speakers (NNES), in ESP courses, because it apparently assisted many NNES engineering professionals in reaching their communicative goals during international business operations. The introduction of such a concept would raise the awareness of students that comprehensibility is far more important than native-like English speech in terms of successful international business communication. Finally, consistent with the concepts of BELF, the practice of listening to a variety of accents (both native and non-native) would be beneficial for future engineers as more business interactions occur among NNES engineering professionals. This would allow engineering students get used to these accents, as some of them are influenced by the first language, as well as increasing their confidence in terms of communicating in real life situations.

However, there were some limitations found, in terms of a number of participants (N=40) which were not enough to be able to generalize the current situation of workplace communication in this field. In addition, the investigation was only conducted in international companies in the Bangkok metropolitan area, with the other key companies situated in industrial estates in Chonburi and Rayong, located in the provinces of eastern Thailand. The inclusion of the participants from those industrial estates may have provided more insightful information about international communication. In terms of further studies on this topic, in the field of English for Specific Purposes, the researchers should take this issue into consideration.

ACKNOWLEDGMENTS

The researchers are grateful to the International College for Sustainability Studies at Srinakharinwirot University for granting the research fund.

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