# Use of the English language prior to and during employment: experiences and needs of Thai novice engineers

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ABSTRACT: English language proficiency matters greatly in the global economy, and can be considered to be a key factor for success of certain professionals, including engineers. However, there have been a number of complaints about the gap between what is taught in university language courses, and what is used in workplace communication. This research deals with the current situation of how Thai novice engineers use language prior to and during their employment. It was found that the courses had not provided enough of the language skills, which are pertinent to novice engineers; they had not enhanced students' confidence in oral proficiency or of their reading skills (of articles, manuals, minutes and annual reports). It is critical for teachers to improve English courses for engineering students immediately, in particular non-native English speakers, to become well-qualified future members of the workforce in the global community.

Keywords: Engineering English, workplace communication, job recruitment, novice engineer

## INTRODUCTION

Commonly, English language proficiency matters greatly in the global economy, to professionals at both the national and international levels. Professionals, including engineers, are expected to communicate effectively in English, even though they often use their mother tongue in everyday life [1][2]. In the 21st Century, engineers must know not only how to convey technical information effectively, but also how to perform in the workplace with acceptable communication skills [3].

In the ASEAN Economic Community (AEC) of which Thailand is a member country, engineering is one of the eight professions for which it is possible to work in any of the member countries, and language skills play a key role in the communication. However, in many non-native English speaking countries, such as Japan, Taiwan, Malaysia, India and Hong Kong, novice engineers' language proficiency does not meet the requirements of the workplace, and there are complaints about the gap between what is taught in university language courses and what is realistically used the workplace communication.

Typically, engineering students, and particularly non-native English speakers, are primarily educated with technical knowledge and skills, but they have few opportunities to develop their language proficiency and workplace communication skills. To solve the existing problem and keep pace with the changing professional world, higher education institutions should take an active role in designing curricula, which are able to equip students with effective domain-specific knowledge and skills, together with excellent language proficiency.

#### LITERATURE REVIEW

Due to globalisation, high challenges and tough competition, the engineering labour market requires well-qualified engineers. Apart from domain-specific knowledge, employability skills or non-technical skills are regarded as being an important factor to be successful in job recruitment. These include communication skills, problem-solving skills, goal-setting skills, interpersonal skills, visioning skills, IT and computer skills, leadership skills, self-assessment skills, numerical competency, lifelong learning and having a global mind-set [4]. Therefore, these skills have to be integrated into most courses, seminars, workshops, industrial trainings and practical trainings at the higher education level to develop those skills to undergraduate students. Many engineering companies, such as in Hong Kong, Japan, Malaysia

and Singapore have set the priority of engineering employability skills such that effective English communication is ranked at the top or upper levels. Especially in large and well-known companies in those countries, communication skills are a must for job applicants, because hard international competition and a need to maintain worldwide standards for companies require effective communication [5].

Employers usually gain an advantage by hiring employees with high language proficiency. Thus, in the recruitment process, language proficiency is one of the criteria. [6]. However, the proficiency level required may be different, depending on the size of companies. The larger a company is, the more necessary proficiency is [7-9]. In the foreign market, spoken English is acceptable as an easy approach to international communication. However, the English spoken by Malay novice engineers in the manufacturing industry is still below the requirements and expectations in the workplace [10]. In India, the situation is more serious, with almost 70% of novice engineers failing to gain employment because they lacked English writing and speaking skills [11].

Because of the necessity of such language proficiency in the workplace, various studies have been conducted to gauge the perceived level of proficiency and self-ratings have been employed worldwide. The perceived proficiency is based on individual evaluations of the ability to communicate [12], and various aspects of foreign language (i.e. grammar, phonology, lexis, syntax, pragmatics), the trauma or success with foreign languages in the past, and recent communication experiences, are correlated to a process of gauging overall proficiency [13]. Additionally, second language anxiety, perceived second language competence and actual second language competence are inter-correlated: more competent and less anxious users tend to overestimate their proficiency, and *vice versa* [14].

In a study of French graduates' perceived language proficiency in the workplace, the results revealed that the level of proficiency was not high [15]. Also, a study of vocational students' perceived language proficiency in Taiwan found that those students perceived their proficiency at the fair level, asserting that Chinese culture's value of modesty or lack of self-confidence directly affects the self-ratings [16]. In a study on perceived oral proficiency of students in Tanzania, the perceived proficiency was average, and the affective factors of such perception are attitudes, anxiety, classroom activities, motivations and learning resources [17]. Practically, self-ratings are useful to assess how competent people think they are, not to assess how competent they actually are [12]. The ratings should not be used when the researcher is concerned with actual proficiency.

According to the nature of their profession, engineers deal with the development, provision and maintenance of infrastructure, and goods and services for industry and the community. However, the role of engineers has drastically changed from merely *engineering* to managing, discussing and negotiating with various professions [18][19].

The engineers also have to deal with the tasks, which require more English: a) writing emails, minutes, reports, project proposal, business letters, memos and presentation slides; b) speaking with customers on occasional visits, talking about everyday tasks and duties, communicating via teleconference, communicating on telephone, giving oral presentation, attending meetings or seminars, and having informal and social conversations; c) reading written instructions or advice, manuals, project documents, office documents and professional texts; and d) receiving spoken instructions or advice, and listening at international seminars or conferences.

Without an ability to do so, barriers and distortion can lead to miscommunication and a breakdown, which could lead to negative repercussions for the company [20][21]. In Thailand, the improvement of such language proficiency in industry is a major goal and is one of the crucial national targets of economic development [22][23]. The range of engineering settings in which English communication takes place is wide and it is at the root of all success [24-30].

The limitations of engineering workplace communication have been recently reported in many studies, particularly in non-native English speaking countries. For instance, in Hong Kong, employers in a range of sectors complain about novice engineers for their insufficient language proficiency, and there has been a call to higher education institutions for an improvement of engineering undergraduates' language proficiency [31]. In Japan, some engineers experience difficulty in delivering messages during conversations, because their language proficiency lags behind the demand in an international business setting [26].

In Thailand, engineers with insufficient speaking skills do not communicate confidently with foreign professionals [3]. To solve such problems, studies on the needs analysis of engineering workplace communication have been conducted, and the improvement of the language proficiency of engineers, including novice engineers, has been discussed worldwide. For example, in Taiwan, writing and reading skills are needed for emails, reports and memos, followed by speaking skills: meetings, teleconferences and presentations. More specifically, speaking skills are in demand for customer visits and relationships in their workplace [25].

According to this literature review and due to the existence of few studies in a Thai context, this study addresses the following research questions: a) what are novice engineers' experiences in applying English language skills learned from the university prior to and during employment?; b) what are the self-ratings of the novice engineers' oral English proficiency?; and c) what are English language skills needed for effective communication in the engineering workforce?

## **METHODOLOGY**

The total of 260 novice engineers graduated from a Thai government university in May 2012. The participants of this study were the 189 novice engineers who returned a completed questionnaire. Sixty per cent worked for national companies, while 40% worked for international ones. A questionnaire developed from related studies was used to collect data. It comprised four parts: a) demographic information; b) use of English language learned from the university's English courses in recruitment and workplace communication; c) self-reports of oral English proficiency; and d) English language skills needed for effective communication in engineering workplace. In parts three and four, each item was scored on a four-point scale with numerical values to show the extent to which participants agreed with the statements as follows: 1 = poor/low, 2 = fair/quite low, 3 = well/quite high, 4 = very well/high. All questions were translated from English into the Thai language, and *vice versa* by two translators, so that the students could clearly understand all the questions.

To ascertain the content validity of the instruments, the three experts in the fields of English language and engineering education were asked to revise the contents before the data collection. Additionally, to ensure reliability, a pilot study was done using ten novice engineers from another university in Bangkok who were not participants in the eventual study. Data collection was completed within a day in May 2013 during the rehearsal of commencement at the Faculty of Engineering. The questionnaires were analysed, providing descriptive statistics including frequencies, means, standard deviations and percentages.

#### **RESULTS**

Before job recruitment, about 60% of respondents took extra English language courses. More than a half of them (59.5%) used the English proficiency test scores to apply for their present job, revealing that even novice engineers working for national companies (60% of all) prepared their English language skills prior to job recruitment, and needed to prove their language proficiency to their present workplace before employment. Regarding using language skills during job recruitment and in the workplace, most of them applied the language skills, which were learned from courses provided by both universities and outside providers. As for frequency of the language use in the workplace, about 40% used English every work day, followed by almost half using it on most work days (3-4 days a week) and some using it on some work days (1-2 days a week). As for extra courses taken during their employment, 44.3% did not take any courses, but planned to take language courses in the future.

According to the results of the overall perceived oral English proficiency shown in Table 1, all of the six abilities were rated at a *fair* level. The highest proficiency level was achieved for responding to conversation in English. However, the other abilities (i.e. constructing oral sentences, using domain-specific vocabulary, expressing opinions, using grammar, and producing intonation and stress effectively) were lower, but not greatly different. Looking closely at all abilities in Table 1, they did not perceive their proficiency as proficient, but rated themselves as *fair* users. However, of the six abilities, they rated these three abilities slightly higher. Basically, a) they had an ability to respond to conversation in English, they could interact in English conversation better with simple issues, and more than a sentence; b) regarding their ability to construct oral English sentences, they could use English sentences better to communicate in work-related contexts and issues; and c) as for using domain-specific vocabulary to communicate, they could best use technical vocabularies in specific areas. As for the lowest level of perceived proficiency, they could not reproduce intonation and stress effectively.

Table 1: The novice engineers' oral English proficiency.

Oral English proficiency	Level of t	Level of the perceived language proficiency		
	$\overline{\mathbf{x}}$	SD	Meaning	
Ability to express opinions in English				
Expressing opinions in simple English	2.28	0.59	Fair	
Explaining understandable opinions	2.32	0.60	Fair	
Providing sound reasons to support the opinions	2.23	0.60	Fair	
Overall	2.28	0.51	Fair	
Ability to respond to conversation in English				
Interacting in conversation more than a sentence	2.53	0.69	Fair	
Interacting in conversation in a simple issue	2.57	0.64	Fair	
Interacting in conversation in a complex issue	2.07	0.62	Fair	
Interacting in complex issues quickly	1.92	0.69	Fair	
Overall	2.30	0.54	Fair	
Ability to make oral English sentences				
Making sentences to communicate in work-related contexts	2.31	0.62	Fair	
Making understandable sentences every time	2.26	0.57	Fair	
Making sentences which both content and context are related	2.29	0.63	Fair	

Overall	2.29	0.55	Fair
Ability to use grammatical English			
Using basic grammar	2.46	0.69	Fair
Using complex grammar	2.10	0.67	Fair
Using correct grammar	2.16	0.62	Fair
Changing sentence patterns according to the situations	2.23	0.64	Fair
Overall	2.24	0.57	Fair
Ability to use domain-specific vocabulary in English			
Selecting correct vocabularies in communication	2.29	0.61	Fair
Using various type of vocabulary in communication	2.25	0.65	Fair
Using technical vocabularies	2.32	0.65	Fair
Overall	2.29	0.58	Fair
Ability to produce intonation and stress effectively			
Producing understandable pronunciation	2.19	0.60	Fair
Producing consistent pronunciation throughout the conversation	2.14	0.62	Fair
Producing understandable intonation	2.14	0.62	Fair
Producing consistent intonation throughout the conversation	2.13	0.64	Fair
Producing understandable stress	2.11	0.66	Fair
Producing consistent stress throughout the conversation	2.09	0.65	Fair
Overall	2.13	0.56	Fair
Oral English proficiency	2.25	0.48	Fair

Regarding the need for language skills in Table 2, most respondents identified that their need for English skill was high. The most needed skill was reading, while writing, speaking and listening were also necessary to novice engineers.

To look closely at the needs for English language skills, respondents needed to master their reading skills, in particular, an ability to read engineering-related articles and manuals in English, and to read minutes and annual reports. As for the secondary needed skills, they wanted to master writing skills, which were the ability to make notes, to write business email, to write up projects, and to write minutes and annual reports in English. However, speaking and listening skills were also rated as highly needed skills. When they had a conversation or had to deal with oral communication, they needed the ability to choose the best word, to pronounce it clearly and to make complete sentences to communicate in English. In addition, listening skills, which included the ability to understand rapidly-spoken English and to understand engineering terms were required.

Table 2: Needs of the English language skills.

Need for English language skills	Level of the English skills needed		
	$\overline{\mathbf{X}}$	SD	Meaning
Listening skills			
Listening to non-native speakers' accent	2.41	0.92	Quite high
Understanding rapid English speaking	2.44	0.92	High
Understanding technical vocabulary	2.69	0.78	High
Understanding the English spoken in a discussion, a meeting and/or a seminar	2.57	0.82	Quite high
Overall	2.53	0.73	High
Speaking skills			
Pronouncing clearly	2.57	0.83	High
Making complete sentences to communicate	2.56	0.81	High
Selecting correct word choice	2.59	0.84	High
Giving English oral presentation	2.55	0.87	High
Conducting an English negotiation	2.52	0.92	High
Expressing opinion during a discussion, a meeting and/or a seminar	2.55	0.89	High
Overall	2.56	0.79	High
Reading skills			
Reading English engineering-related articles and manuals	2.79	0.80	High
Reading minutes and annual reports	2.75	0.78	High
Overall	2.77	0.78	High
Writing skills			
Writing business emails	2.74	0.83	High
Making notes	2.75	0.81	High
Writing project proposals	2.67	0.84	High
Writing minutes and annual and/or project reports	2.62	0.85	High
Overall	2.69	0.78	High
Needs of the English language skills	2.64	0.69	High

#### DISCUSSION

There were several key findings. First, English courses provided to the engineers during their undergraduate education were not pertinent to effective communication in recruitment and the workplace. About 60% took extra courses, and language skills were sought from not only the university, but also from other language schools. The data clearly suggest that the language skills learned and the skills used in the actual workplace did not match. Basically, such skills help novice engineers gain employment in both national and international companies. Also, most of them have to use the language in their workplace at least some time during the week, though the frequency of their use differed, depending on the nature of each position, and the companies. They also planned to take language courses to improve their proficiency. Such findings ascertain that language proficiency is required by companies in Thailand, similar to other Asian countries, such as Malaysia, Hong Kong, Taiwan and Japan [4]. In other words, having satisfactory language skills is a priority to be successful in the competitive engineering world. Thus, there must be an urgent call to the higher education institutions in many Asian countries including Thailand for the improvement of future workforce language proficiency [2][11][25][31].

Second, the engineers perceived their oral proficiency as being *fair*. An ability to produce intonation and stress effectively was at the lower end, though the others were slightly varied. Even though proficiency was identified according to participants' perceptions, not by a standardised test, the data imply that they are not confident in their proficiency, a reflection that developing such proficiency in language courses was not the main focus of oral proficiency needed in the workplace. Theoretically, personality factors have a direct impact on their perception [12-14][16][17].

In a study on assessing the language proficiency of French economics graduates, based on the six-level Common European Framework of Reference for Languages, the graduates expressed difficulty in meeting the oral English requirement [15]. Such findings are also consistent with studies in other countries, such as India [11], Taiwan [25] and Hong Kong [31] that novice engineers have insufficient language proficiency. It can explain why in those countries including Thailand, engineers who are non-native English speakers do not usually have sufficient exposure to English communication before and during their employment, so they experience certain difficulties in face-to-face communicative situations. These include how to construct oral sentences, how to interact in simple and complex issues immediately and how to express opinions with sound support.

Also, engineering education tends to pay more attention to developing students' technical expertise, while English language development is a secondary focus in most engineering curricula. Third, of the four language skills, reading skills and writing skills are required more than the other skills. That there is a strong need to use reading and writing skills is possibly because they are staff at the operative level mostly dealing with reading and writing documents. [6][11]. This explains why language skills are typically part of professional communication and business operations worldwide, as well as organisational progress enhancement.

Based on the findings, the following pedagogical implications are suggested to teachers and stakeholders, particularly in English for specific purposes (ESP). First, there should be an annual re-evaluation of English for engineering courses by conducting research on novice and experienced engineers to improve the courses in relation to the current trend of workplace needs. Their feedback would fill the huge gap between what is needed in communicative situations of the real workplace, and what is taught in the current educational institutions. Second, the realistic communicative situations, such as constructing an immediate response and expressing opinions in face-to-face workplace communication should be a primary focus of the English learning activities. Third, teachers should investigate how their students perceive their proficiency. Using self-reports will reveal whether students are confident or anxious English users, and such perception helps teachers understand proficiency development in order to decide on effective language courses.

Due to the limitation and the scope of this study, the researchers have only investigated quantitative data; thus, there are no qualitative data regarding how novice engineers encounter specific problems in using English for job recruitment and workplace communication. Further research regarding communication problems should be undertaken to identify current situations of language use in the two contexts.

# CONCLUSIONS

This article has provided a picture of Thai novice engineers' experiences in applying the language skills, which were learned from university courses prior to and during employment, the self-ratings of their language proficiency and skills needed for effective engineering workplace communication. According to the results, university English courses have to provide English language skills which are pertinent to the engineering profession and enhance language proficiency. The particular requirement is to have the ability to master all four language skills.

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