

Original Research Paper

Exploring the English Language Skills Needed at Engineering Companies

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Abstract: This paper reports the results of an English language needs analysis carried out at different multinational engineering companies in Batam, Indonesia. Through the implementation of needs analysis questionnaire to 50 engineers from various engineering companies, the perceived importance and frequency of linguistic needs of learners in terms of skills and sub-skills are specified. The results show that most engineers perceived reading as the most important skill, followed by listening, writing, and speaking; whereas, in terms of frequency, reading has also been perceived as the most frequent skill, followed by listening, writing and speaking. Emphasis should be put on receptive skills (a total mean score of 16.048) rather than productive skills (a total mean score of 15.423). However, findings also depict those engineers considered some of the oral communicative event(s) such as reporting work to superiors to be very frequent at work. The implications of the findings indicate that materials design and development should consider the incorporation of workplace scenarios as the basis for activities.

Keywords: English Language Sub-Skills, Materials Development, Need Analysis.



1. Introduction

Indonesia is a multicultural society comprised of a multitude of ethnic groups, regions, languages, religions, customs and cultures. Each ethnic group has its own language; however, Bahasa Indonesia or the Indonesian language is the official language; while English is treated as a foreign language. Although English is predominantly used in business settings, most engineers may seemingly struggle with English language use at work even though they can perform the job just as well as those engineers with high proficiency in English. Some of the common problems faced by learners of English are as follows; grammar, vocabulary, slang and colloquialism, pronunciation, and variations in English [1]. Moreover, students may encounter certain difficulties like a variety of grammatical structures, a lot of synonyms, and other features not typical to engineering genres of professional texts.

As the profession of engineering becomes increasingly international, English language skills become very important to facilitate communication between cultures, emphasizing the necessity for English language and communication skills in the engineering curricula [2]. Robinson [3] stated that engineering students have specific English requirements and a basic ESP principle is to equip them with these specific needs as much as possible. Moreover, since ESP is becoming increasingly preoccupied with syllabus design, materials development, and pedagogy, more attention should be drawn to the context in which students will be using ESP. Thus, to bridge the gap between corporate/industry English language expectations and university syllabus and curriculum offerings, Rezaee and Kazempourian [4] suggested the need to implement a thorough language needs analysis as it is of great importance before designing an effective language course.

The English language requirements shall cover the main four skills of listening, speaking, writing, and reading. Each language skill is divided into different functions or sub-skills and further investigation is required as to whether there is a need for each function and/or sub-skill.

This paper reports on the needs analysis phase of a small-scale study conducted by a research team at an industrial engineering department of a local university named Universal University in Indonesia, focusing on various engineering companies located in Batam, Indonesia. The purpose of this inquiry was to identify the actual English language skills needed by engineering students, where English would be required by the industry. This investigation may potentially lead to both syllabus design and module development which could cater for the needs of engineering students in the global era; and hence, ensuring their language development and enhancing their competitive advantage in the job market.

2. Literature Review

2.1. English for Engineering Students

It has been recognized that English skills are highly important in an engineer's workplace and may even be a company policy as more and more multinational companies adopt English as their 'official' workplace language to increase efficiency. Indonesia is among the expanding circle of countries that uses English as a compulsory foreign language and its role has been widely studied for more specific purposes including (not limited to) reading knowledge for scientific and technical purposes which are under the umbrella of English for Specific Purpose (ESP). In addition, having good command of speaking and writing English is ranked the first in terms of important requirements for industrial engineering graduates in Batam, Indonesia [2]. Other than the language skills, Ramlan and Ngah [5] found that soft skills: leadership, teamwork capability, and communication are also perceived as important for engineers [5].

Globalization directly influences the industry's needs; a global engineer must be able to easily cross-national and cultural boundaries. This, according to Riemer [6], in turn directly affects engineering education. However, there is an indication of a lack of a direct fit between graduate skills and those required by industry because it seemed that cross-disciplinary language skills are not sufficiently taught. The students should be equipped with subject-specialist knowledge and specific English language of their chosen field(s) during their study periods at higher learning institutions that would prepare them well for the workplace [7]. Integrating relevant technical jargon and documentation in foreign language tuition courses in engineering is an essential [6]. However, learners of English may be rarely exposed to the specific terminology used by English speakers in the context of the engineering workplace. Therefore, language needs analysis is necessary to identify the organizational objectives and the communicative functions related to the work. Furthermore, the desired outcome in identifying those language needs at workplace is not merely fluency or "the ability to speak confidently without irrelevant pauses or hesitation" [8]; but moreover, productivity at work.

2.2. The Implications of Needs Analysis

One of the fundamental goals of communicative, analytic approaches to second or foreign language teaching is to relate instructional goals, processes, and practices to real-life performance outside the classroom [9]. To do so, a crucial first step is the identification of students' needs (what learners need to learn) in relation to the second or foreign language (L2). One way to identify those needs is to conduct a needs analysis. It explained that needs analysis is concerned with the establishment of communicative needs and their realizations, resulting from an analysis of the communication in the target situation [10].

At the same time, West [11] reported on the expanding concepts of needs analysis and uses the metaphor of a journey to describe the elements involved. In the early days, needs analyses focused largely on necessities or objective needs representing the destination of the learner's journey. These analyses aimed to determine priorities, such as, which skills (reading, writing, listening, speaking) and which situations or tasks e.g., speaking on the telephone or writing minutes from meetings, were important in the target situation. This statement is also supported by Khalik [12] who explained that in [12], there are important differences between, say, the English of economics and that of engineering. Therefore, if language varies significantly from one situation of use to another, it should also be possible to determine the features of specific situations (through needs analysis) and then make these features the basis of the learner's course.

A few studies have been conducted to analyze the language needs of students by going to workplace environments. Goh and Chan [13] administered questionnaires to university undergraduates (potential employees) and companies (potential employers); while Ibrahim (1993) and Leong [14], on the other hand, employed an ethnographic approach which provided researchers with access to the targeted community so that they could gather insider information and collect "firsthand data that are uncontaminated." Goh and Chan [13] reported that based on the responses from the companies, English was important for both recruitment and promotion, with speaking and writing as the first and second most important language skills to possess respectively. Meanwhile, both Ibrahim [15] and Leong [14] found that communication skills during meetings and sales process are essential in workplace environments. On the other hand, Rezaee and Kazempourian [4] also conducted a similar study on English requirements of electrical engineering companies and found that reading skill and study skills stand in the first and second place respectively; while listening, writing, and speaking stand in the third, fourth, and fifth place respectively [4]. Similarly, Kaewpet's [16] study also found that reading and writing comprised the majority of responses, with reading being named as the most essential.

2.3. English Language Problems for Engineering Students in Indonesia

The Indonesian government has required students to learn English as a Foreign Language from primary to high school in the form of national standards. In total, Indonesian students generally study English for 12 years at school. However, the reality is more emphasis might have been placed on the learning of grammar and syntax (rather than the communicative language learning approach) because first, the English teachers themselves may not be necessarily competent in using the language itself. Although grammar and syntax do, to some extent, play important roles at workplaces, they do not necessarily support the development of communicative competence and/or abilities in both oral and written forms [17]. Hence, it is crucial to identify the actual skills as well as the communicative functions related to the work, in particular the work of engineers.

Ramlan and Ngah [5] emphasized that communication is one of the important soft skills that engineers should acquire because having good technical knowledge alone may be insufficient. For example, engineers may need to be able to convey information to co-workers and upper-level management by writing comprehensible, precise reports at work, or be able to maintain effective communication at work [5]. However, whether or not those communicative events continued to be significant for engineering students in the current situation, still remains unknown. In other words, an update of information (through needs analysis) is deemed as necessary. Therefore, it is important to identify not only the language skill(s) that engineering students need to possess; but also, the different sub-skills that may be used by engineers and/or required at engineering companies.

In Indonesia, a typical English class consists of approximately thirty to forty students. As a result, teachers may not have sufficient time to design meaningful exercises that allow students to use what is being learned in class. This statement is also supported by Hughes and McCarthy [18] who agreed that designing learning tasks is a time-consuming process. Additionally, Khalik [12] criticized that ESP teachers are heavily relying on the materials in the market and although some of the selected materials

may fit the students' needs, they may not necessarily meet the actual needs at workplace. Indeed, Kaewpet [16] highlighted that what is learned in the class should directly and authentically be applicable outside the class. In short, students at schools in Indonesia are often presented with inauthentic learning materials yet Berardo [19] stated that authenticity is essential to Communicative Language Teaching (CLT) because he believes that learners of English need to be exposed to real language as often as possible. Hence, such statement has implied that it is crucial to not only identify the actual language skills/sub-skills used at work; but moreover, the frequency of each skill/sub-skill being performed at work so that language instructors can prioritize the skills/sub-skills that are based on each of its frequency.

The fact that English is not widely spoken among Indonesian people has somewhat reduced the learners' tendency to use the language outside the classroom. Consequently, Indonesian learners of English may struggle with expressing their thoughts or ideas as they tend to be receptive in their learning approach. However, receptive skills alone may be insufficient at work because Goh and Chan [13] found that based on the responses from the companies, both speaking and writing are considered the first and second most important language skills to possess respectively. Similarly, Kassim and Ali [20] identified both productive skills as having the highest mean scores (at 4.2875) compared to both listening and reading skills. Furthermore, Kakepoto, Omar, Boon, and Igbal [21] reported that oral communication skills play a vital role for engineers, especially in a workplace that involves multiple stakeholders because it assists them to perform workplace jobs effectively and efficiently according to employer satisfaction. Also, Ramlan & Ngah [5] added that an engineer is often required to communicate not only with other engineers but also with co-workers from different departments as well as with upper-level management which do not have the same background. Therefore, language needs analysis is necessary to identify the oral communicative functions (including each of its frequencies) that are performed by engineers among the different personnel in the context of the engineering workplace.

This study aims at exploring the English language skills used by engineers in Batam, Indonesia based on their perceptions. Specifically, the objectives of this research paper are:

- (1) to identify the actual English language skill(s) that are perceived as important by engineers at engineering companies,
- (2) to identify the actual English language skill(s) that are perceived as frequent by engineers at engineering companies, and
- (3) to identify the perceived frequency of conducting oral communication among different personnel at engineering companies.

2.4. Different Types of Language Needs Analysis

To identify the language and skills that learners will use in their target professional or vocational workplace or in their study areas needs analysis should also be identified and considered in relation to the present state of knowledge of the learners, their perceptions of their needs, and the practical possibilities and constraints of the teaching context. The information obtained from this process is used in determining and refining the content and method of the ESP course. According to Basturkmen [10], the needs analysis process involves:

- Target situation analysis: what the learners should ideally know and be able to do in the job.
- Discourse analysis: which can be used to analyze the kind of language used in the engineering companies.
- Present situation analysis: which considers the learners' ability in terms of how much learners know (or do not know) about the language use in the job.
- Learner factor analysis: which considers learners' motivation, how they learn, and their perceptions of their needs.
- Teaching context analysis: which relates to the environment in which the course will run.

In its simplest form, needs analysis is a pre-course design process in which information is gathered to help the teacher or course developer decide what the course should focus on, what content in terms of language or skills to include, and what teaching/learning methods to employ. Target situation analysis, present situation analysis, and learner factor analysis are the main landmarks in needs analysis studies [7]. This study adapted the target situation analysis approach since it is more appropriate for the objectives of the study which is to investigate the actual English language needs for engineers at engineering companies.

3. Methodology

3.1. Sample

The subjects of this study were 50 engineers coming from different parts of Indonesia and all of them have had at least 1 – 6 years of work experience at various engineering companies. This study took place online where online questionnaires were randomly emailed to a population of approximately 100 engineers working at over 20 national and/or multinational engineering companies in Batam (Indonesia): PT. (Perseroan Terbatas or Private Limited Company) Caterpillar Indonesia Batam, PT. Six Electronics Indonesia, PT. Schneider Electric Manufacturing Batam, PT. Boilertech Indonesia, PT. SWTS Batam, PT. TEC Indonesia Batam, PT. Citra Tubindo Engineering, PT. Bintang Bersatu Apparel, PT. Epson Batam, PT. Prisled Innovative Lighting, and other similar companies. An approximate sample of 50 engineers (with various backgrounds such as mechanical, manufacturing, maintenance, etc.) completed and returned the email questionnaires at their convenience. Those engineering companies were chosen (1) based on their status as a registered national and/or multinational company in Batam and (2) through network and connections made between the engineering lecturers at Universal University and their engineer connections in Indonesia.

3.3. Instrument

This study utilized a self-developed survey questionnaire to identify the English language skills and the communicative events in which English was mostly used by engineering employees. The development of the survey was based on: (1) reference to previous studies on needs analysis, (2) verbal and e-mail feedback from informal discussions with engineers and human resource managers, and (3) interviews with engineering lecturers to determine the most common English communicative events that are encountered in an Indonesian engineering context. Based on those and in regards to the three research questions, questionnaires were designed with items that inquire the engineers' perceptions of their ability in using English, their perceptions of the relative importance of different language skills/sub-skills in relation to their job, as well as the frequency of usage in various skills/sub-skills, and the remaining items focus on various functions in relation to oral communication among different groups of personnel.

Before given to respondents, the construction of questionnaires (and interview questions) involved continuous consultation with a few engineering lecturers who also happened to previously work as engineers. After which, the surveys were pilot-tested to 5 engineering lecturers at Universal University to determine its suitability. The survey received some constructive feedback which was later used for revision.

Section A is on 4.1. background information of each engineer at his/her respective company and his/her perceived ability in using each of the four language skills (3 items). Section B is divided into two sub-sections: 4.2. the importance of English language skill(s) and/or sub-skill(s) as perceived by engineers at their respective companies (4 items) and 4.3. their perceived frequency of using each language skill and/or sub-skill (4 items). Lastly, Section C focuses on 4.4. their perceived frequency of conducting oral communication for various functions among different groups of personnel at their workplace (1 item).

All sections (except for background information in Section 4.1) used a Likert-type scale to indicate the engineers' response to the items. In Section 4.1, the items were rated for the respondents' ability in each of the language skill (1 = "extremely poor" to 5 = "very proficient"). In Section 4.2, the items were rated for the extent to which each skill/sub-skill was important to the respondents (1 = "not important at all" to 5 = "very important"); whereas, in both Section 4.3 and Section 4.4, all items were rated for the extent to which each skill/sub-skill was frequent to the respondents (1 = "never" to 5 = "very often").

In addition, interview session is conducted to confirm the findings from the survey data. A sample of 5 respondents has been selected from the fifty respondents. The five respondents were chosen based on their: (1) length of work experience of at least one year, (2) English proficiency of at least pre-intermediate, and (3) availability to attend the interview session. During the interview, four of them were found to have more less the same level of language proficiency which is at intermediate while the other one is an advanced user (as shown in Table 1). Although no formal test was conducted, their language proficiency was briefly assessed based on their fluency and accuracy in spoken English during the interview. Each respondent is presented with 5 questions:

- 1) how important are English language skills for engineers at work?
- 2) what language problem(s) do engineers normally encounter at work?
- 3) which English skill(s) that you perceive as important at work?

- 4) which English skill(s) that you frequently use at work?
- 5) how often do you have to speak in English at work and with whom and for what purpose(s)?

Table 1. The Interviewees' Background Information

Company	Gender	Age	Year of Working	English Proficiency Level
PT Caterpillar Indonesia Batam	F	41	5 - 6 years	Intermediate
PT Citra Tubindo Engineering	M	55	> 8 years	Advanced
PT Tomoe Valve Batam	M	40	< 2 years	Intermediate
PT Batam Aero Technic	M	42	> 8 years	Intermediate
PT Catur Teknik Mandiri	M	42	> 8 years	Intermediate

Both questionnaires and interview are used to explore the importance of language skills and areas as well as engineers' opinions of needs. The analysis and findings may hopefully assist language instructor(s) to generate an overview of teaching materials that aims to increase students' attention to, and usage of English language skills in different types of context at engineering workplace.

4. Finding and Discussion

4.1. The Engineers Background Information and Their Perceived Ability in English

As shown in Figure 1, most respondents (21) have (or have less than) 2 years of work experience; while only (3) respondents have been working as engineers for at least 3 – 4 years and slightly more than half the respondents (26) have at least 5 to 8 years of work experience. Out of those 21 respondents are engineers working in the top three fields: mechanical, manufacturing, and process engineering; while less than one third of the respondents are in the maintenance, quality system, instrument, electrical, and project engineering fields.

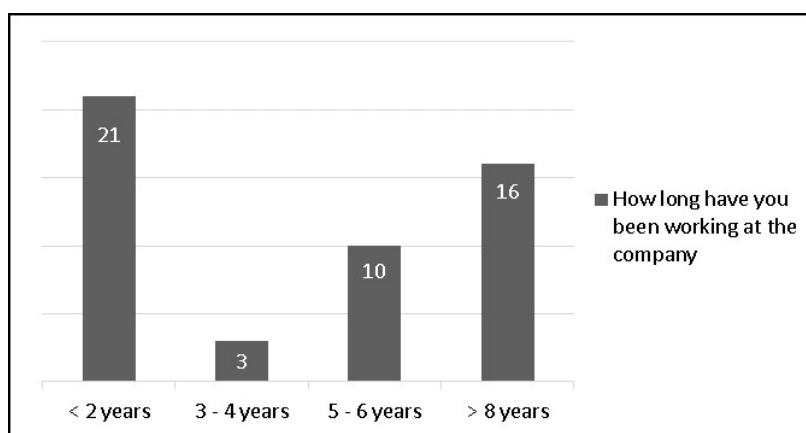


Figure 1. Length of Work for Engineers (in years)

According to Table 2, the strongest ability in English language skill as perceived by the respondents (or engineers) are (in sequential order); reading (3.480), writing (3.340), speaking (3.280), and listening (3.120). Their perceived strength in reading might have been triggered by the fact that most English as a Foreign Language (EFL) students in Indonesia are engaged in reading English text for at least 13 years or since elementary school [22]. However, it does not necessarily mean that EFL students in Indonesia have good English reading habits because their "motivation to read" mostly comes from school assignment [22]. Unlike the EFL students, the engineers might have been motivated to read in English due to their occupational requirements and/or dominance in engineering field; moreover, it is their constant exposure to (or repetition in) reading that might have contributed to

their strength in reading skill. To conclude, the overall results imply that although most engineers tend to be strong in both reading and writing, some may wish to work on their listening skill and speaking skill.

Table 2. The Ability in English as Perceived by Engineers

English Language Skill	No (n = 50)	Mean	SD
Listening	50	3.120	0.824
Speaking	50	3.280	0.904
Reading	50	3.480	0.909
Writing	50	3.340	0.848

4.2. The Perceived Importance of English Language Skills for Engineers

This section reports on the results regarding engineers' perceptions on the importance of the four English language skills. Based on Table 3, the overall mean score for each of the four language skills is higher than 4.0 except for speaking (3.938). However, this does not indicate the insignificance of speaking; but more emphasis may need to be given to receptive skills of reading (4.167) and listening (4.112). Although Goh and Chan [13] reported that speaking and writing as the first and second most important language skills to possess respectively, the above finding actually confirmed with Rezaee and Kazempourian's [4] findings in which both reading and listening skills are found to be more significant than writing and speaking. Interestingly, Kaewpet's [16] study also showed that reading being named as the most essential skill perceived by the engineers at work.

All the items have mean score between 3.0 and 4.4. Among the four language skills, the mean score for each sub-skill shows that reading technical manuals/documents (4.400) has been perceived to be the most important. This is followed by writing report (4.420), following spoken instruction (4.280), and telephone communication (4.100). The overall results indicate that engineers perceived all the English sub-skills as important to be acquired.

4.3. The Perceived Frequency of Using Each Language Skill

This section presents the engineers' responses to section B of the questionnaire which required them to select the English language sub-skills that they perceive as frequent (Table 4). It was found that the overall mean score for reading (3.949) has been perceived as the most frequent skill, followed by listening (3.820), writing (3.755) and speaking (3.682). This finding confirmed with Spence and Liu's [23] study in which reading and writing were rated most common with well over 60% as they were used very often, in particular reading written instructions/advice (52.94%) which was most frequently used on a daily basis [23]. Similarly, Kaewpet's (2009) research also identified both reading and writing skills, in particular reading as the most frequently used skill in the engineering workplace.

As shown in Table 4, reading written instructions/advice (4.220), writing emails (4.140), following spoken instructions (3.940), receiving spoken instructions/advice (3.940), and discussing work (3.880) were the English language sub-skills that majority of engineers reported as frequently used at work. In overall, the respondents (engineers) perceived all the English sub-skills as fairly frequent, with more attention given to reading and listening which have the overall mean scores of 3.949 and 3.820 respectively.

4.4. The Perceived Frequency of Conducting Oral Communication among Different Personnel

Other than identifying both the perceived importance and frequency of English language sub-skills, Splitt [24] states that one of the challenges in ESP is the need to enhance learners' people-related skills as employees face different types of people at all levels in the organization. Hence, it is important to identify the type of personnel and the language skill that engineering students may potentially encounter at the workplace. The overall mean results from Table 5 show that generally, the most frequent communication among different personnel is with superior(s) (3.770); whereas, the least frequent communication is with colleagues from international branches (3.265).

Apparently, reporting work to superiors is perceived as the most frequent function in English oral communication (4.000) because of occupational and professional requirements for English at engineering companies, and in addition, some superiors are potentially ex-pats working in Indonesia. This finding also supported Kassim and Ali's [20] study which showed that engineers tend to use

English with their superiors more frequently than with their colleagues and subordinates. Similarly, in 2009 Kaewpet's survey also found high interaction between engineers and English-speaking superiors at the workplace where the contents of the communication might concern work completed and/or work in progress.

According to Table 5, having project communication with international colleagues (3.080) and negotiating prices with suppliers/contractors (3.080) are, on the other hand, perceived as the least frequent function. The oral communication conducted with international colleagues is mostly related to general knowledge (3.460) and engineering knowledge (3.420). Also, engineers tend to discuss the technical aspect of the product (rather than negotiating for the prices) with the product suppliers/contractors such as making inquiries (3.320), asking for product range (3.340), or asking for specifications (3.540). The overall results suggest that engineers conducted a fairly frequent oral communication among different personnel at work, with higher priority given to superiors and clients/customers which have the overall mean scores of 3.770 and 3.410 respectively.

Table 3. The importance of 4 Language Skills as Perceived by Engineers

English Language Skill		No (n = 50)	Mean	SD	Overall Mean
Reading Importance	Reading written instructions/advice	50	4.360	0.631	4.167
	Reading field-related articles and books in English	50	3.920	0.601	
	Reading project documents	50	4.340	0.658	
	Reading technical manuals/documents	50	4.400	0.639	
	Reading standards related to the design	50	4.340	0.745	
	Reading office documents	50	4.040	0.727	
	Reading texts on the computer	50	4.120	0.746	
	Reading professional texts	50	3.960	0.807	
	Reading notes	50	4.020	0.714	
Writing Importance	Writing emails	50	4.300	0.886	4.048
	Writing memo	50	3.660	1.062	
	Writing formal letter	50	3.980	0.892	
	Writing meeting minutes	50	3.900	0.909	
	Making presentation slides	50	3.920	1.007	
	Writing project proposal and/or project reports	50	4.020	1.040	
	Writing report	50	4.420	0.642	
	Making technical specifications for equipment(s)	50	4.180	0.825	
Listening Importance	Following instructions	50	4.280	0.809	4.112
	Receiving spoken instructions/advice	50	4.180	0.825	
	Listening in meetings/seminars/workshops	50	4.120	0.918	
	Listening and understanding the contractual, legal, and technical negotiations in English	50	4.060	0.890	
	Teamwork interaction	50	3.920	1.027	
Speaking Importance	Giving formal presentations	50	3.880	0.940	3.938
	Teamwork interaction	50	3.900	0.931	
	Small-talk	50	3.760	0.894	
	Discussing work	50	4.080	0.752	
	Having contractual and legal negotiations in English	50	3.820	0.962	
	Teleconferencing	50	3.900	0.995	
	Telephone communication	50	4.100	0.814	
	Conflict resolution/responding to complaints	50	4.060	0.818	
	Networking	50	3.940	0.818	

Table 4. The Frequency of 4 Language Skills as Perceived by Engineers

English Language Skill		No (n = 50)	Mean	SD	Overall Mean
Reading Frequency	Reading written instructions/advice	50	4.220	0.815	3.949
	Reading field-related articles and books in English	50	3.540	0.994	
	Reading project documents	50	3.920	1.158	
	Reading technical manuals/documents	50	4.200	0.756	
	Reading standards related to the design	50	4.120	0.918	
	Reading office documents	50	3.820	0.983	
	Reading texts on the computer	50	4.080	0.900	
	Reading professional texts	50	3.800	1.010	
Writing Frequency	Reading notes	50	3.840	0.997	3.755
	Writing emails	50	4.140	0.969	
	Writing memo	50	3.660	0.982	
	Writing formal letter	50	3.620	0.967	
	Writing meeting minutes	50	3.560	0.972	
	Making presentation slides	50	3.620	1.176	
	Writing project proposal and/or project reports	50	3.640	1.064	
	Writing report	50	4.020	0.937	
Listening Frequency	Making technical specifications for equipment(s)	50	3.780	0.887	3.820
	Following instructions	50	3.940	0.913	
	Receiving spoken instructions/advice	50	3.940	0.935	
	Listening in meetings/seminars/workshops	50	3.780	0.954	
	Listening and understanding the contractual, legal, and technical negotiations in English	50	3.720	1.031	
Speaking Frequency	Teamwork interaction	50	3.720	1.126	3.682
	Giving formal presentations	50	3.720	1.126	
	Teamwork interaction	50	3.680	1.096	
	Small-talk	50	3.660	0.872	
	Discussing work	50	3.880	1.003	
	Having contractual and legal negotiations in English	50	3.600	1.143	
	Teleconferencing	50	3.460	1.232	
	Telephone communication	50	3.840	1.037	
	Conflict resolution/responding to complaints	50	3.720	1.089	
	Networking	50	3.580	1.012	

4.5. The Interview Questions and Answers

The face-to-face interview with the five respondents took place on May 14 – May 18, 2018 at a local university in Batam, Indonesia. After each question was posed, each respondent offered his/her opinions and individual experiences.

In response to the importance of English language skills at work, all five respondents claimed that English is extremely important at work because not only that they need to use it, but English itself is a fundamental language of communication especially in the engineering workforce.

When asked what problems that engineers usually encounter at work, most respondents indicated that both written and oral communication have been their language concern at work. In other words, interviewees are concerned with their productive skills. This finding confirmed with Table 2, where most respondents tend to perceive stronger ability in the receptive skill of reading (3.480), rather than their productive skills of writing (3.340) and speaking (3.280). They also added that they often struggle with expressing (or explaining) their ideas at work; while a few respondents claimed that different culture and language variation (accent) have seemingly affected their communication at work. Indeed, such problem(s) need to be considered when designing learning materials for the

engineering students because not only that language is the main concern here; but moreover, ‘work productivity’ is equally essential. In other words, language instructors and/or materials developers also need to aim for productivity at work by keeping the language barriers to a minimum level.

Table 5. The Frequency of Conducting Oral Communication among Different Personnel as Perceived by Engineers

English Language Skill		No (n = 50)	Mean	SD	Overall Mean
Clients/Customers	Explaining product range	50	3.420	1.263	3.410
	Negotiating price	50	3.140	1.485	
	Explaining technical specifications	50	3.720	1.262	
	Providing consultancy	50	3.360	1.336	
Colleagues from international branches	Project communication	50	3.080	1.397	3.265
	Having small talk on culture exchange	50	3.100	1.313	
	Sharing engineering knowledge	50	3.420	1.180	
	Sharing general knowledge	50	3.460	1.232	
Superiors	Project discussion	50	3.720	1.179	3.770
	Giving formal presentation	50	3.580	1.162	
	Meeting	50	3.780	1.112	
	Reporting work	50	4.000	1.069	
Subordinates	Giving instructions	50	3.340	1.255	3.366
	Project discussion	50	3.500	1.298	
	Giving formal/informal presentation	50	3.204	1.291	
	Meeting	50	3.420	1.311	
Suppliers/contractors	Making enquiries	50	3.320	1.392	3.320
	Asking for product range	50	3.340	1.334	
	Asking for technical specifications	50	3.540	1.358	
	Negotiating prices	50	3.080	1.412	

When it comes to answering the question on English language skill(s)/sub-skill(s) that are perceived as important, most respondents suggested that both reading and writing skills are given more priority at work than speaking skill and listening skill. Hence, this confirmed with the above findings in Table 3 except that listening (4.112) received higher priority than writing (4.048) and speaking (3.938).

On the other hand, when asked about which English language skill(s) that they frequently use at work, most respondents indicated that speaking skill is highly frequent at work, especially with superiors and suppliers. Only one respondent mentioned writing as a highly frequent skill at work. Interestingly, a previous study on language skills conducted by Kassim and Ali [20] found that during the informal interview with engineers, speaking skill need to be given higher priority compared to other skills. Furthermore, they later identified that both productive skills have the highest mean scores (at 4.2875) compared to listening skills at 4.2031 and the lowest, reading skills, at 4.0938 [20]. However, such finding (during the interview) did not confirm with the data in Table 4 in which reading (3.949), instead, has been perceived as the most frequent skill; whereas, speaking itself is the least frequent skill at work. This finding suggests that there may be no correlation between the data collected through interview and questionnaires.

Finally, most respondents implied high frequency of oral communication in English at workplace. Most communication has been conducted with their superiors at work for reporting/discussing work purposes which correlates with the similar finding in Table 5, where reporting work to superiors

received the highest mean scores of 4.000. During the interview, it was also found that some engineers speak in English frequently with the company suppliers for the purpose of solving problems as well as discussing equipment specifications. Hence, this finding confirmed with the data from Table 5 in which the sub-skill of asking for specifications from suppliers (3.540) obtained the highest frequency in the oral communication with suppliers.

Based on the findings from the interview, there seems to be a greater emphasis placed on productive skills at work as opposed to findings from Table 3 and Table 4 which put more weight on receptive skills. Hence, it is important that language instructors prioritize skills/sub-skills that are more important and/or frequently used at workplace.

4.6. Discussion

In comparison with the results of Table 3 and Table 4, it can be concluded that the overall mean score for the language skills that are perceived as important by engineers, is generally higher than the overall mean score for their perceived frequency of using those language skills. Such results indicate that the English sub-skill(s) perceived as important by engineers may not necessarily lead to a higher frequency of those sub-skills. Similarly, a sub-skill that is perceived as frequent may not result in that sub-skill being perceived as important. In fact, none of the items shows any correlation between each sub-skill's perceived importance and each of its perceived frequency e.g., the perceived importance of telephone communication (4.100) and the perceived frequency of telephone communication (3.840). However, such findings may have several implications on materials development in class. First, the language instructors may have to decide on whether they should prioritize the language sub-skills that are important for engineers or frequent at work. Second, if the sub-skills for materials development are mostly based on the engineers' perceived importance, such skills may indicate subjectivism. In contrast, if such skills for materials development are solely based on engineers' perceived frequency, not all future engineers may be conducting similar task(s) or skill(s) at the workplace. Hence, the main question is whether materials need to be based on perceived importance or perceived frequency.

In response to this, according to Harding [25] advises the use of authentic materials for learning and most importantly, learners need to learn things that they need to do at work. In other words, language instructors may wish to prioritize materials based on their actual (rather than perceived or subjective importance of) daily work activities – tasks that engineers perform regularly depending on each task's frequency level at work. At the same time, Tomlinson [26] also supports the idea of authenticity in which students at the Engineering Faculty need to be familiar with a real and meaningful input so that they will be more focused on building meanings than studying forms, and more oriented to understanding than in early production. In addition, Astrid, Isabel, and Alfonso [27] further explained that when students are exposed to materials that they consider as interesting and useful, their interest in knowledge is promoted and stimulated; at the same time, it is possible to do a greater mastery in people who are learning a language [27]. Furthermore, when learners are repeatedly exposed to authentic materials in different contexts, students' vocabulary knowledge could be improved [28]. Hence, authentic materials are essential in language learning. Zhang [29] warned the danger of not using authentic materials on learners' language learning such as reasons for overuse, underuse, or misuse in the process of language learning. Last, other than authentic materials, Venkatraman and Prema [30] also highlight the importance for the language instructors to possess a special set of competencies/skills (other than general English skills) to deliver the teaching materials. Moreover, language instructors need to enhance their teaching methodologies to bridge the gap between the college and the workplace [31].

Interestingly, according to Table 5, reporting work to superior(s) is the only sub-skill with the mean score of at least 4.000; while the rest of sub-skills among other personnel are scoring below 4.000. Both communicative events: project communication with international colleagues and negotiating prices with suppliers/contractors, have been perceived as the least frequent oral skills with the same mean score of 3.080. The results indicate that engineers used English more frequently with their superiors (who may happen to be a foreigner or an expat) compared with their colleagues. This finding confirmed with Kassim and Ali's [20] findings that engineers tend to use English with their superiors more frequent than with their colleagues and subordinates. Furthermore, this finding implies that superiors or upper level management may require engineers to communicate frequently in English even though speaking is perceived as the least important as well as the least frequent language skill (as shown in Table 3 and Table 4 respectively). And although speaking skill received the lowest priority and frequency when compared to other skills (as shown by Table 3 and Table 4), the overall results

from Table 5 suggest the need for oral communication with other personnel – in particular with superiors, still applies at work.

However, during the interviews with the 5 respondents, it was found that they put more emphasis on productive skills than receptive skills, especially speaking; but later found to encounter difficulties in expressing (or explaining) their ideas at work; while different culture and language variation (accent) have somewhat affected their communication at work. At the same time, this suggests the need to consider the cultural problems faced by employees when communicating via speaking in English such as differences in English accents, complicated question, or eye-contact during face-to-face encounters [32]. Moreover, according to Siepmann [33], English skills play an important role in promoting a person's self-development, improving cross-cultural understanding, and in enhancing one's career advancement. Therefore, it may be necessary to consider such cultural problems in module/materials development so that understanding such problems will assist engineer(s) to better understand as well as to better deal with the cultural influences on English communication.

It is hoped that the results of this analysis can be used to develop a module on effective speaking skills based on workplace scenarios, with the scenarios chosen from the communicative events which the engineers ranked as frequent.

5. Conclusion

This study explored the perceived English language needs from engineers' perspectives in terms of their importance and frequency in each skill. In addition, this study also investigated the perceived frequency of conducting oral communication among different personnel at work.

The findings revealed that most engineers perceived reading as the most important skill, followed by listening, writing, and speaking; whereas, in terms of frequency, reading has also been perceived as the most frequent skill, followed by listening, writing and speaking. Also, reading has been perceived by the respondents (engineers) as the strongest skill; this might have been caused by occupational requirement and in particular, constant exposure to reading text in English because learners have the tendency to perform better when they have more practice. Additionally, several implications are made on materials development, namely; the language sub-skill(s) that need to be prioritized in teaching, the use of authentic materials, and the language instructors' level of competency.

When it comes to the oral communication among different personnel, most engineers encountered most frequent communication with superior(s) (3.770); whereas, the least frequent oral communication is with colleagues from international branches (3.265). However, engineers should also be aware of the cultural problems during oral communication in English such as differences in English accents, complicated question, or eye-contact during face-to-face encounters. Understanding such problems will assist people to better encounter with some of the cultural issues on English communication.

Interestingly, the findings from the interview suggest that more emphasis is placed on productive skills at work (especially speaking), as opposed to findings from Table 3 and Table 4 which put more weight on receptive skills. Hence, language instructor(s) may need to prioritize language skills that best meet the actual condition of engineering workplace.

Lastly, the language instructor(s) must work closely with the students to understand their needs and plan out an effective methodology for training them. Hopefully, the findings may give language instructor(s) an overview of the reality of industry challenges and the gap between the student engineer's academic environment and workplace could be reduced so that the employability skills of students will be enhanced.

So far, this research paper has intended to identify the various skills and functions performed by engineers in Batam, Indonesia. However, this paper only focuses on English language skills/sub-skills and their main functions and yet, there may be a necessity to do further research on both syllabus design and module development which could cater for the needs of engineering students as future global engineers. Hence, ensuring their language development and enhancing their competitive advantage in the job market.

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