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Vocabulary Needs of Engineering Students: A Survey

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ABSTRACT

There is substantial amount of technical vocabulary that new engineering students at the tertiary level are required to read and understand in their field of study. Technical vocabulary refers not to a single word but to a group of terms used to explain scientific processes and relations. This means that in the field of engineering, a scientific field, many technical terms are used. These terms may pose some difficulties to the students when reading engineering textbooks, so here seems to be a need to familiarize them with engineering terms to facilitate reading of those textbooks. In order to develop this specialist list of engineering terms, a group of 7 engineering lecturers were interviewed to find out the students' vocabulary needs through the seven subject matter expert perspectives. In addition, a survey was carried out on a group of 318 engineering students in a tertiary institution. The survey aims to find out the needs of engineering students for a list of introductory engineering terminology. This paper will therefore present the results of the survey.

Keywords: Engineering terms, word list, reading, textbooks, vocabulary

INTRODUCTION

The literature in the field of English for Specific Purposes (ESP) and English for Academic Purposes (EAP) suggests that the language of scientific texts comprises general words, sub-technical or academic words, and technical words (Liu and Nesi, 1999; Yang, 1986) and that technical words are different from general and sub-technical words in a number of ways and have an effect on learners' comprehension of technical texts.

Nation (2001) classifies English vocabulary into four types: high-frequency words, academic words, technical words, and low-frequency words. Normally, high-frequency words appear as 80 percent of the running words in the normal text (West, 1953). Academic vocabulary or sub-technical vocabulary refers to those words used in different kinds of academic texts. Academic words are identified from a variety of academic texts and a new academic word list (AWL) of 570 word families introduced by Coxhead (2000). Words of this type normally cover 9 % of the running words in the text. Technical words are specialized words closely related to a specific area or field of study like engineering, medicine and linguistics. They are purposefully used in specialized textbooks.

Rahman (2012) found that it is apparent that reading skills for academic purposes were important for most of the students to master the readings of text books/reference books, technical journal articles, and other documents written in English. The findings reveal that the majority of the students faced difficulties in skimming for the gist of the subject matter written in English. Many of the respondents found difficulties in scanning to extract specific information of subject matters written in English. Most of the students agreed that they found difficulties in decoding meaning of the subject matters written in English.

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Laufer (1989) observes that readers need 95 percent of lexical words in the text for comprehension. Likewise, Sutarsyah, Nation and Kennedy (1994) maintain that a lack of familiarity with more than 5 percent of lexical words in a text can cause learners problem in reading comprehension. As the proportion of technical vocabulary in technical or ESP texts is high, it can pose difficulties to students in understanding the texts.

To understand the engineering texts, students need both knowledge of the field and knowledge of the language. Nation (2001) suggests that students who know the scientific area may have little difficulty with technical terms. This means knowledge of the specific field is essential in learning the technical language of that field. However, the problem of limited knowledge of the field can be solved by contextualizing for the students the contents they are to deal with (Love, 1991) and using texts from the field which are not overly complicated. For the knowledge of the language, it is important for EAP/ESP teachers to know what to include and introduce as part of language teaching, especially important words or vocabulary.

According to Shamsudin, Abdul Manan and Husin (2012), engineering students tend to have problems with technical terms rather than other types of words. Before enrolling in technical English courses, students in most of the Malaysian higher learning institutions would have studied general English for years, and they are required to take general English courses during the first year of study. During their English classes, the students have the opportunities to see a variety of English texts in different contexts. They therefore are familiar with common English or everyday language, so they come to ESP classes with at least some knowledge of general words.

In general English classes, engineering students have a chance to read many text types and to learn different types of vocabulary. Kornwipa Poonpon (2002) analyzed an English book, Inside Out, published by Macmillan Heinemann English Language Teaching in 2000. She found that this book contains academic words up to 257 word families (in comparison with Academic Word List by Coxhead (2000), with 1,307 occurrences. This proves that students whom would have already come across in their general English courses both general words and academic words and might have learned some of them. However, they might not have been exposed to the technical language of the engineering texts which mostly appears in that specific domain (Nation, 2001).

Scientific or technical English is possibly new to them as it contains single scientific words which can be new and unknown to the students, and used to compact information by the use of multi-word units which can provide more complications and complex meanings for a group of words. In this way, technical words are likely to cause more difficulties for the students than general and sub-technical or academic vocabulary.

In the Malaysian context, Shamsudin, Abdul Manan and Husin (2012) found that there is hardly any introductory engineering or a familiarization program for students who would be placed in the various engineering programs in tertiary institutions in the country. It is rather too sudden for them because some had just finished their secondary or college education where specialization is not yet the norm.

Much the same thing happens in the classroom every day. Instructors and textbooks use terms and concepts of which students may not have the prior knowledge to provide an adequate context for interpretation. This may lead to reading difficulties to the students. When this happens, students might not be able to comprehend or understand whatever they are reading.

Reading is a very complex process that requires many different skills. Hancock (1998) believes that in reading, "comprehension involves understanding the vocabulary, seeing relationships among words and concepts, organizing ideas, recognizing the author's purpose, evaluating the context, and making judgments" (p. 69). Because of its complexity, researchers have studied and examined many different areas of reading. Some studies looked at the effects of prior knowledge in reading comprehension (Brantmeier, 2005; Hammadou, 1991, 2000; Johnson, 1982; Lee, 1986; Nassaji, 2003; Qian, 2002) while others have examined the effects of vocabulary knowledge (Alderson, 2000; Joshi & Aaron, 2000; Martin-Chang & Gould, 2008; Nagy & Scott, 2000; Pressley, 2000). Knowing how prior knowledge and vocabulary knowledge help reading comprehension would be an important area to explore because it could give teachers new approaches to teaching.

For example, Johnson (1982) finds that a lack of cultural familiarity in ESL students has a greater impact on reading comprehension of a passage on Halloween than the pre-teaching of vocabulary. Lee (1986) studied the effects of background knowledge in reading, understanding and recalling of text in second language learners and finds that the learners' ability to recall is enhanced when they are presented with one of the three components of background knowledge context, transparency, and familiarity.

One theory concerning why prior knowledge affects comprehension is the ability of the students to make inferences. According to Hammadou (1991), inference refers to a cognitive process used to construct meaning through a thinking process that involves reasoning beyond the text through generalization and explanation. In the study, Hammadou (1991) examines inference strategies used by students and finds that background knowledge affects the comprehension process. He found that beginner readers use a greater amount of inference in recall than advanced readers. Because greater inference is used by novice readers, this is an indication that the readers' background knowledge affects the comprehension process and that recall and comprehension are not the products of the text alone.

Although many studies have shown the effects of prior knowledge in reading comprehension, acquiring background knowledge is usually not the focus of many foreign language classrooms. Many of the textbooks used in the foreign language classes often focus on developing various reading strategies such as previewing, skimming and scanning, summarizing, reviewing, critical thinking, understanding text structure and most importantly, vocabulary building. Vocabulary is important in reading comprehension because vocabulary knowledge is part of background knowledge. The more words the readers know, the easier they will understand what they read.

Joshi and Aaron (2000) find that vocabulary knowledge is a strong predictor of reading ability when factoring reading speed with decoding and comprehension. Martin-Chang and Gould (2008) find a strong correlation both between vocabulary and reading comprehension and between reading rate and primary print knowledge. Vocabulary knowledge is essential in reading comprehension because it has a similar function to background knowledge in reading comprehension. Vocabulary knowledge helps students in decoding, which is an important part of reading (Qian, 2002).

In relation to the above, many other researchers consider vocabulary knowledge to be an important variable that affects reading comprehension in both first and second language learning (Alderson, 2000; Joshi, 2005; Qian, 2002).

In another study, Martin-Chang and Gould (2008) look at the relationship among vocabulary, reading comprehension, reading rate and print exposure. They find a positive relationship between vocabulary knowledge and reading comprehension on primary print knowledge and secondary print knowledge. Primary print knowledge is more on the personal reading materials, while secondary print knowledge is focusing on general literacy materials. There is also a strong correlation between reading rate and primary print knowledge, but not secondary print knowledge. This suggests that reading for pleasure is an important part of language development because it can increase vocabulary knowledge and reading rate, both of which facilitate reading comprehension.

The development of vocabulary and background knowledge will in turn help students with their reading comprehension (Joshi & Aaron, 2002; Martin-Chang & Gould, 2008; Qian, 2002). Therefore, it is important that the students spend time reading, not only for the enjoyment of the language, but also to gain vocabulary and background knowledge.

PROBLEM STATEMENT

University textbooks may carry terminology that students are not familiar with, and this can affect their reading comprehension. Students from school may not have the background knowledge of technical vocabulary, and since the occurrence of technical terms may not be as frequent as general vocabulary in communication, they are thus less familiar. This situation may pose an obstacle to reading comprehension in the students' area of study. Engineering students may be demoralized when there are too many technical words in their specialized engineering textbooks.

Students may need an introduction or exposure to the technical terms to help them in developing familiarity with the technical vocabulary of the engineering field. But it is also felt that there might be a contrasting opinion, since this opinion may see that technical vocabulary would be acquired once students are inducted into this field. There is thus a need to identify to what extent is our students' background knowledge on engineering vocabulary and to determine the learning strategies used by our engineering students in Malaysia to help them comprehend engineering texts.

This study therefore intends to answer the following research question:

- *To what extent is the engineering students' background knowledge on engineering vocabulary?*
- *What are the learning strategies used by the engineering students to understand engineering vocabulary?*

METHODOLOGY

The aim of this study is to identify whether there is a need to develop a word list of engineering terms for engineering students. The researchers identified six engineering textbooks that are used by the engineering students from four faculties at Universiti Teknikal Malaysia Melaka. These textbooks are drawn from the faculties' syllabus and deemed important to students by the engineering lecturers as the textbooks provide the basic engineering terminology that is useful to these students. The textbooks are:

1. Electrical & Electronic Technology by M.S. Hughes, (2008)
2. Principles of Electric Circuits (7th Edition), by L.F. Thomas, (2003)
3. Electrical Technology by M.S. Hughes, (1995)
4. Fundamental of Electric Circuits (3rd Edition) by K.A. Charles, & N.O. Sadiku, (2003)
5. Principles of Electric Circuits (9th Edition), by T.L. Floyd (2009)
6. Electronic Devices & Circuit Theory (11th Edition), by R. Boylestad, & L. Nashelsky, (2012)

Participants

The participants of this study are engineering lecturers and students from Universiti Teknikal Malaysia Melaka. The respondents for the survey questions were second and third year engineering students. The reason for choosing second and third year students was because first year engineering students may not yet have to experience going through learning engineering vocabulary and probably are still not familiar with the technical terms. The reason for choosing participants from this university is because it is an engineering focus university.

Research Instrument

The research instruments that were used in this study were questionnaire and interview. The questionnaire consists of three sections, namely *Part A* which seeks demographic information, *Part B* which seeks information on students' engineering vocabulary knowledge and *Part C* which consists of a vocabulary test for the students. There are five demographic questions in *Part A*, seventeen questions in *Part B* and twenty questions in *Part C*.

The demographic questions in *Part A* require the respondents to provide their personal particulars, such as their name (which will not be made public), program, faculty, their native language and gender.

There are 17 questions for *Part B*, in which and respondents are required to rate their answer using Likert Scale from Scale 1 to Scale 5 *(Scale 1 - Strongly Disagree, Scale 2 - Disagree, Scale 3 - Not Sure, Scale 4 – Agree, and Scale 5 - Strongly Agree)*. Question 1 to 17 require the respondents to rate the following statements:

Question 1	When I first started this course, it was quite difficult for me to understand engineering text.
Question 2	Now, I still have difficulties in understanding engineering text.
Question 3	When I first started this course, it was quite difficult for me to learn engineering vocabulary.
Question 4	I have enough vocabulary knowledge to understand engineering text.
Question 5	I can easily understand what I read in my engineering textbooks.
Question 6	There is a lot of new vocabulary in my engineering textbooks.
Question 7	I pay more attention to engineering vocabulary in my textbooks.
Question 8	I know enough academic vocabulary.
Question 9	I can use my vocabulary easily.
Question 10	I use bilingual dictionary to help me translate engineering vocabulary.
Question 11	I use engineering dictionary to help me understand engineering vocabulary.

Question 12 I use pictures illustrated in the textbook to understand the engineering vocabulary.
Question 13 I ask the lecturer to put an unknown engineering vocabulary into a sentence to help me understand the vocabulary.
Question 14 I ask my classmate for meaning of the engineering vocabulary.
Question 15 I need more help in understanding engineering vocabulary.
Question 16 I want to know more on how an engineering vocabulary is explained in a text to improve my understanding of the text.
Question 17 I would be happy to have a list of fundamental engineering terms especially in the early stage of my study to help me understand engineering vocabulary.

As for *Part C*, respondents were required to complete a vocabulary test based on a selected technical passage from an engineering textbook. The passage was selected from an introductory engineering textbook and the technical words selected were approved by the engineering lecturers who took part in this research. This test was to find out their familiarity with technical vocabulary. In this section, 20 selected technical words from the passage were required to be rated by the respondents using Likert Scale from *Scale 1* to *Scale 4*. *Scale 1* is for statement *"I don't remember having seen this word before"*, Scale 2 *"I have seen this word before, but I don't know what it means"*, Scale 3 *"I know this word and I understand what it means"* and lastly Scale 4 *"I can easily use this word in sentence"*. The selected vocabulary are *resistance, circuit, conductor, current, voltage, excessive, filament, incandescent, carbon, alloys, manganin, copper, radiates, dissipated, melt, insulation, retarding, raceway, accordance* and *installations*.

The other instrument used in this study is interview. The respondents for this instrument are the lecturers from Universiti Teknikal Malaysia Melaka. There are six questions in the interview. *Question 1* seeks to find out the number of years of working experience the lecturers have. *Question 2* requires the lecturers to give their opinion on their students' performance in terms of technical vocabulary knowledge. *Question 3* aims to find out if they actually reviewed introductory topics on engineering first before proceeding with the new syllabus.

As for *Question 4*, the lecturers are required to give their view(s) on whether the students are having problems or difficulties when engineering terminology is introduced to them. *Question 5* seeks the lecturers' opinion(s) of having a word list of engineering terms to help familiarize students to the engineering vocabulary. The final question, *Question 6*, requires the lecturers to give their opinion(s) on the importance of selecting introductory engineering textbooks drawn for faculties' syllabi.

DATA ANALYSIS

Data from the questionnaire were analyzed using frequency count whereas data from the interview were analyzed via frequency count for dichotomous questions and content analysis for open-ended questions.

RESULTS AND DISCUSSION

There are two types of data collection instruments used in this study, namely questionnaire and interview. A total of three hundred and eighteen students took part in the questionnaire and eight lecturers took part in the interview.

With reference to the data collected from *Part A* of the questionnaire, the respondents are from three engineering faculties in Universiti Teknikal Malaysia Melaka (UTeM). The faculties are Faculty of Electronics and Computer Engineering, Faculty of Information and Communication Technology and Faculty of Mechanical Engineering.

No	Item	A (%)	NS (%)	DA (%)	M	SD
1	When I first started this course, it is quite difficult for me to understand engineering texts.	142 (44.7)	58 (18.2)	118 (37.1)	3.1164	1.08429
2	Now, I still have difficulties in understanding engineering text.	123 (38.7)	100 (31.4)	95 (29.8)	3.0000	1.02339
3	When I first started this course, it is quite difficult for me to learn engineering vocabulary.	121 (38.1)	67 (21.1)	130 (40.9)	3.0252	.85880
4	I have enough vocabulary knowledge to understand engineering text.	102 (32.1)	123 (38.7)	93 (29.2)	3.2736	.83910
5	I can easily understand what I read in my engineering textbooks.	143 (44.9)	116 (36.5)	59 (18.6)	3.7044	.75816
6	There is a lot of new vocabulary in my engineering textbooks.	229 (72.1)	62 (19.5)	27 (8.4)	3.4088	.79995
7	I pay more attention to engineering vocabulary in my textbooks.	159 (50)	119 (37.4)	40 (12.6)	3.0975	.79426
8	I know enough academic vocabulary.	94 (30.2)	154 (48.4)	68 (21.4)	3.3585	.80050
9	I can use my vocabulary easily.	154 (48.4)	119 (37.4)	45 (14.2)	3.4969	.88716
10	I use bilingual dictionary to help me translate engineering vocabulary.	202 (63.5)	62 (19.5)	54 (17)	3.3648	.99792
11	I use engineering dictionary to help me understand engineering vocabulary.	182 (57.2)	62 (19.5)	74 (23.3)	3.5189	.84321
12	I use pictures illustrated in the textbook to understand the engineering vocabulary.	231 (72.7)	53 (16.7)	34 (10.7)	3.7296	.84200
13	I ask the lecturer to put an unknown engineering vocabulary into a sentence to help me understand the vocabulary.	141 (44.3)	98 (30.8)	79 (24.9)	3.2107	1.01857
14	I ask my classmate for meaning of the engineering vocabulary.	279 (87.8)	25 (7.9)	14 (4.4)	4.0660	.70959
15	I need more help in understanding engineering vocabulary.	221 (69.5)	62 (19.5)	35 (11)	4.0472	.69312
16	I want to know more on how an engineering vocabulary is explained in a text to improve my understanding of the text.	240 (75.5)	58 (18.2)	20 (6.3)	3.7516	.90455
17	I would be happy to have a list of fundamental engineering terms especially in the early stage of my study to help me understand engineering vocabulary.	249 (78.3)	57 (17.9)	12 (3.8)	3.1226	.98284

The respondents are the second and third year engineering students. The majority of the respondents in this study are males; totaling 201 and 117 are females. This situation whereby male students are more than female students is quite common as engineering is known as a male dominated field of study. Below is the discussion of results for the questionnaire.

Table 1.0 Reliability statistics of the questionnaire

Cronbach's Alpha	N of Items
.799	40

The alpha coefficient for the forty items is .799, suggesting that the items have relatively high internal consistency. A reliability coefficient of .70 or higher is considered "acceptable" in most social science research environments (Creswell, 2002). Table 2.0 below presents the result of the seventeen statements using Likert Scale as well as the mean and standard deviation derived from the survey.

Table 2.0 Item statistics for background knowledge and need analysis survey

Legend:

A	Agree
NS	Not Sure
DA	Disagree
M	Mean
SD	Standard Deviation

All seventeen statements in *Part B* require the students to rate their choice. For the first item, when the students were asked whether they it was difficult for them to understand the engineering texts when they first started the course, a total of 142 of the respondents agree, 118 respondents disagree. The other 58 were not sure whether they faced the difficulty or not when they started the course. For item 2, out of 318 respondents, 123 agree when they were asked if they still have difficulties in understanding engineering text while 95 respondents disagree. 100 respondents cannot be sure whether they still have the difficulties in understanding engineering text.

Next, for Item 3, "*When I first started this course, it was quite difficult for me to learn engineering vocabulary*", 121 respondents agree, whereas another 130 disagree. A total of 67 respondents were not sure whether they faced they difficulty in learning engineering vocabulary in the initial stage of their study.

In Item 4, a total of 123 respondents were not sure whether they already have enough vocabulary knowledge to understand engineering text or not. However, 112 respondents think they have enough vocabulary knowledge while 93 respondents confirm that they do not have enough vocabulary knowledge.

Next, 143 respondents agree that they can easily understand what they read in engineering textbooks while 59 respondents disagree. Nevertheless, there are 116 respondents who cannot confirm whether they can easily understand they read in their engineering textbooks.

For Item 6, a majority of 229 respondents agree that there is a lot of new vocabulary in their engineering textbooks while only 27 respondents disagree. However, another 62 were not sure with the statement. Next, 159 respondents feel that they are paying more attention to their engineering vocabulary in their textbooks as stated in Item 7 while 119 respondents were not sure leaving another 40 respondents disagree with the statement.

Out of 318 respondents, 96 respondents feel that they have enough academic vocabulary, whereas 68 respondents think that they do not have enough academic vocabulary. However about 48.4 percent or 154 respondents were not sure whether they have enough academic vocabulary or not.

For Item 9, 119 chose not sure whether they can use their vocabulary easily while 154 respondents think that they are able to use their vocabulary easily in their learning process. However, the remaining 45 respondents confirm otherwise.

There were 202 respondents agree with in using bilingual dictionary to help them translate engineering vocabulary, but another 54 respondents confirm in not using bilingual dictionary to understand engineering vocabulary. The other 62 respondents or 19.5 percent were not sure whether they use bilingual dictionary to help them understand engineering vocabulary.

In Item 11, 182 respondents or 57.2 percent agree that they use engineering dictionary to help them understand engineering vocabulary. 74 respondents disagree with the statement and the other 62 respondents were not sure whether engineering dictionary helps them in understanding engineering vocabulary.

As for Item 12, 72.7 percent or 231 respondents agree that they use pictures illustrated in the textbook to understand the engineering vocabulary. However, 10.7 percent or 34 respondents disagree and the other 16.7 percent or 53 respondents were not sure whether pictures illustrations in textbook do help them to understand the engineering vocabulary.

Next, for Item 13, a total of 141 respondents agree to the statement; *"I ask the lecturer to put an unknown engineering vocabulary into a sentence to help me understand the vocabulary"*. However, 79 respondents disagree leaving another 98 respondents rating it as not sure.

When the students were asked whether they seek for their classmates' help for meaning of the engineering vocabulary, a majority of 279 respondents agree, whereas only 14 respondents disagree. However, there are 25 respondents who are not sure about seeking classmates' help in understanding engineering vocabulary.

A majority of 225 respondents agree that they need more help in understanding engineering vocabulary whereas 35 think they do not need more help. However a total of 62 respondents cannot confirm about getting more help in understanding the engineering vocabulary.

In Item 16, 240 respondents think that they want to know more about how an engineering vocabulary is explained in a text to improve their understanding of the text. However, 20 respondents feel that they do not want it and 58 respondents were not sure if they want to know more on how engineering vocabulary is explained on the textbook.

Finally, in Item 17, a total of 249 agree that they would be happy to have a list of fundamental engineering terms especially in the early stage of my study to help me understand engineering vocabulary, while12 disagree and another 57 respondents are not sure about having such list will help them understand engineering vocabulary in their early stage of the study.

There are two questions that provided us with interesting results in this survey. Questions No. 4 and No. 8 showed that most of the students are not sure whether they have enough vocabulary knowledge to understand engineering text and whether they have enough academic vocabulary. Therefore, it is quite a solid reason to say that they need help in their learning process especially in understanding engineering texts and reading comprehension.

In essence, data from Part B of the survey suggest that the respondents need continuous help and guidance in understanding technical vocabulary. A word list of fundamental engineering terms would be good for them especially at the early stage of their engineering study just to help them on the background knowledge and get them to be familiar with the terminology of the engineering field.

Next is the discussion for *Part C* of the survey. As shown in Table 2.0, we can see clearly that Scale 4 and Scale 3 dominate the results. Most of the respondents think that they can easily use the words in a sentence or at least they know the word and understand what it means. However, the words; *incandescent* and *manganin*, score quite high in the frequency, that are 40.6 percent and 35.2 percent respectively. It is a total of 129 respondents for the word *incandescent* and 112 respondents for the word *manganin*. Most of the students or respondents should have seen the word before but they do not know what it means (Scale 2).

From the Table 2.0, we can see clearly that there are few words that the respondents think that they have not seen before (Scale 1). 48 respondents chose the word *incandescent*, 92 respondents chose the word *manganin*, 44 respondents selected the word *dissipated*, 52 respondents chose the word *raceway* and 40 respondents chose the word *accordance*.

The words in the Vocabulary Test were taken from a passage in an introductory engineering textbook and are used during the first year of engineering program. This finding shows that even second and third year students are still not familiar with technical terms that they should at the initial stage of their study.

Similarly, the result also suggest that equipping the engineering students with a word list of engineering terms will help them to be aware of the technical terms or the engineering vocabulary throughout their learning process.

Table 3.0 The result of the vocabulary test

Word	Scale 1 I don't remember having seen this word before.	Scale 2 I have seen this word before, but I don't know what it means.	Scale 3 I know this word and I understand what it means.	Scale 4 I can easily use this word in a sentence.
resistance	0	16 (5.0%)	109 (34.3%)	193 (60.7%)
circuit	1(.3%)	5 (1.6%)	103 (32.4%)	209 (65.7%)
conductor	0	6 (1.9%)	112 (35.2%)	200 (62.9%)
current	0	4 (1.3%)	95 (29.9%)	219 (68.9%)
voltage	0	4 (1.3%)	101 (31.8%)	213 (67.0%)
excessive	17 (5.3%)	72 (22.6%)	93 (29.2%)	136 (42.8%)
filament	18 (5.7%)	48 (15.1%)	140 (44.0%)	112 (35.2%)
incandescent	49 (15.4%)	129 (40.6%)	90 (28.3%)	50 (15.7%)
carbon	0	13 (4.1%)	116 (36.5%)	189 (59.4%)
alloys	1 (.3%)	25 (7.9%)	110 (34.6%)	182 (57.2%)
manganin	92 (28.9%)	112 (35.2%)	71 (22.3%)	43 (13.5%)
copper	1 (.3%)	20 (6.3%)	118 (37.1%)	179 (56.3%)
radiates	25 (7.9%)	62 (19.5%)	111 (34.9%)	120 (37.7%)
dissipated	44 (13.8%)	76 (23.9%)	93 (29.2%)	105 (33.0%)
melt	2 (.6%)	14 (4.4%)	74 (23.3%)	228 (71.7%)
Insulation	10 (3.1%)	38 (11.9%)	99 (31.1%)	171 (53.8%)
retarding	36 (11.3%)	100 (31.4%)	97 (30.5%)	85 (26.7%)
raceway	52 (16.4%)	99 (31.1%)	104 (32.7%)	63 (19.8%)
accordance	40 (12.6%)	92 (28.9%)	102 (32.1%)	84 (26.4%)
installations	4 (1.3%)	15 (4.7%)	74 (23.3%)	225 (70.8%)

The next section discusses the interview as the second instrument used in this study. Question 1 seeks information on how many years of working experience the lecturers have. The lecturers' teaching experiences range between three – ten years. Two of the lecturers are Associate Professors.

When the lecturers were asked to give their opinion on how they think their students perform in terms of technical vocabulary knowledge, two lecturers thought that the students are fine whereas another six felt that the students are not performing in terms of understanding new technical vocabulary. Next, the lecturers were asked if they actually reviewed

introductory topics on engineering first before proceeding with the new syllabus. Five out of eight said that they have a short session in the early semester just to recap on the previous syllabuses, but another three stated that they will proceed with the new syllabus.

As for Question 4, the lecturers are required to give their view(s) on whether the students are having problems or difficulties when engineering terminology is introduced to them. Five lecturers agreed with the statement. This is possibly because students from schools or matriculation centers may not have the background knowledge on specific engineering field or in particular engineering terminology.

When they were asked to give their opinion(s) on having a word list of engineering terms to help the students to develop familiarity with the engineering vocabulary, seven out of eight lecturers think that it is necessary. They think it is a good idea to facilitate the students' learning and to develop familiarity with the engineering terminology in particular. On the final question, Question 6, which requires the lecturers to give their opinion(s) on the importance of those selected introductory engineering textbooks drawn from the faculties' syllabi, all the lecturers think that those textbooks are highly important to the students as the textbooks served as the basic and the background knowledge for the engineering field of study.

CONCLUSION

The findings of this study suggest that students' background knowledge is essential to the learning process. Without it, students will have difficulties in understanding what is being taught or even difficulties in comprehending technical texts. Students from secondary school and matriculation centers are normally students that do not have background knowledge in engineering field. Some of them may not be familiar with engineering terminology at all. This situation may lead to cultural shock during the students' initial years of study.

Background knowledge has a profound influence on students' ability to comprehend what they read. Its effect can be defined directly, as in knowledge of the topic, as well as indirectly, especially in the ability to resolve problems when meaning is lost. Evidence of one's background knowledge can also be seen in the vocabulary used in oral and written language. Thus, we can say that the ability to acquire new vocabulary is linked to background knowledge. That is the relevance of background knowledge to our students.

Therefore, there is a need for fundamental information to be integrated in the initial part of the engineering programs. Similarly, this study suggests that there is a need to develop a word list of engineering terms for engineering students in the initial years of their study. Having such word list will help to support students' background knowledge, to develop familiarity with technical vocabulary and to prepare the students for more engineering terminologies in their learning. Pedagogically it may help the lecturers to be more helpful to those beginner students in engineering field.

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