

# A STUDY OF NEEDS IN USING ENGLISH OF ENGINEERING STUDENTS AT QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE AND TECHNOLOGY, PAKISTAN

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## Abstract

The purpose of this study was to analyse the engineering students' need to use English. The target population included two groups: fourth year engineering students (523) and engineering teachers (173), and the sample of this study included 217 students and 132 engineering teachers. They were selected by the simple random sampling technique. Two sets of questionnaires (students and teachers) were used as research tools and verified by three experts. The Cronbach's alpha reliability coefficients of questionnaires were .95. Data were analysed by using mean score, standard deviation, and independent t-test. The findings showed that both teachers and students found very extensive needs of speaking and writing skills at their top priority. They needed more courses to design in order to meet their needs.

**Keywords:** engineering programs, needs analysis, engineering students' needs

## Introduction

English language is used all around the world. Wardhaugh (2006) [1] mentioned that European Union uses English as the official language. Similarly, many commonwealth countries as well as in many world organisations consider English language as an official language. In addition, United Nations also use English as one of six official languages. It has often been referred to as a "world language" because over a billion people speak English at least a basic level. According to Schelpppegrell and Royster (1990) [2] English is the only medium of instruction for international business and many multinational companies all around the world arrange English language trainings for their

employees. Adler (1989) [3] pointed out that technical skills alone are not sufficient for employment success; the capability to converse vividly and persuasively often marks the variances between success and failure, for both individuals and for organization. Therefore, to find the needs, problems, and wants of using English prior to implement any course adds better chances for the success of any organization.

Previous research in the field of engineering showed that English language is very important in the academic and professional lives of engineering students (Basturkman, 1998; Pendergrass et al., 2001; Pritchard & Nasr, 2004; Joesba & Ardeo,

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2005; Sidek et al., 2006; Hui, 2007; Venkatraman & Prema, 2007) [4-10]. For example, Pendergrass et al. (2001) [5] pointed out the use of English in engineering education and stated that integrating English into engineering, science, and mathematic courses is an effective way to improve the performance of engineering students in oral and written communication (p. 1). In addition, Pritchard and Nasr (2004) [6] emphasised that “English is of particular importance for engineering and science students because it is the principal international language of science and is looked upon as an effective means for enabling those students to become familiar with professional texts written in English”. Similarly, Joesba; & Ardeo, (2005) [7] stated that English is an international language of science and technology and engineering students have to realize the fact that engineering books, papers, handbooks, and journals are written in English and are included in their reading lists.

Learners were seen to have different needs and interests, which had an important influence on their motivation to their learning. This led to the support of the development of the courses in which relevance to learners needs and interests were of great importance (Read, 2008) [11]. Thus, Needs Analysis (NA) has been used as a tool in English course design, especially in engineering courses where the specific needs of the students are difficult to determine. Therefore, it is important to identify learner needs, problems, and wants within a particular context (Hutchinson & Waters, 1987) [12]. Research (Bosher & Smalkowski, 2002; Butler, 2004; Long, 2005) [13-15] has shown that there is often a lack of

awareness of the existence of NA. The early studies of NA are associated with Munby (1978) [16] who developed one of the earliest models of NA for language course design.

Researchers have investigated needs of using English. For example, Zughoul and Hussein (1985) explored the needs of English at Yarmouk University in Jordan and found that English may be used in most educational settings except for class discussion. There was also evidence that students tended to overestimate their abilities in different language skills. Similarly, Edwards (2000) [17] carried out a needs assessment study to identify the language needs of the German bankers. Researcher found four skills particularly writing and vocabulary in terms of banking came up to be specific needs. However, Ming, Aziz; & Razak’s (2008) [18] study proposed an ESP course framework for foreign postgraduate students of three faculties, studying science and technology at the university. The study offered a framework for the ESP speaking course for foreign postgraduates to meet their needs. Kormos (2002) [19] investigated the language wants of English majors in Hungary. The study found that students wanted English skills including reading texts on the internet, conversing with non-native speakers, writing email messages and translating oral and written English. Soranastaporn (1993) [20] investigated the needs, problems and wants in English language teaching and learning of nursing students at nursing colleges under the control of the nursing college division, office of the permanent secretary, Ministry of public health, Thailand. The findings of the study indicated that both nursing students and teachers felt positive towards English and wanted more English courses. Samawathdana (2009) [21] also explored

the needs, problems and wants of students studying in the bilingual program at Winit School, Thailand. The findings explored problem in four communicative skills, ranking the big problems in speaking during discussion and presentation.

It is worth for QUEST Pakistan to develop an ESP syllabus in order to solve language teaching and language learning problems. According to Munby (1978) [16], Jordan (1989), Nunan (1990), and Mackey (1981) [22-24], the first step to develop ESP syllabus is to do a need analysis (NA) of the language of the students. Similarly, Jordan (1997) [25] defined needs analysis as the starting point in course designing. Need analysis may be developed in order to adapt any language course to accommodate students. To develop NA for engineering students in Pakistan, the studies done in past till now must be reviewed. However, no single research in ESP regarding NA of English for engineering students has been done. Consequently, NA relating to engineering students in Pakistan should be established. Quaid-e-Awam University should start reviewing learners' needs in order to comprehend engineering subjects in English and to enhance their capability to meet future needs and solving problems. The findings of this study can be beneficial for material developers and teachers using English. Therefore, following research question frames this study.

**Research questions:** (1) "To what extent did engineering students need to use English?" and (2) "Is there any difference of needs in using English of engineering students between engineering students and their teachers at Quaid-e-Awam University of Engineering, Science and Technology (QUEST) Pakistan?"

The results of the study could be an input to develop syllabus or material for engineering students.

## Research Methodology

The present study was based on a survey of the academic needs, of engineering learners using quantitative method for gathering information.

### The population, samples, subjects, and sampling

The subjects of the study were fourth year Engineering students and teachers of engineering field at Quaid-e-Awam University of Engineering, Science and Technology, Pakistan. The population was 523 students and 173 teachers, total 696. The size of the samples was determined based on Krejcie and Morgan (1970) [26]. Thus, 217 students and 132 teachers were the subjects for this study. Then students and teachers were selected by the simple random sampling technique.

### Human subjects

The researchers asked for permission to conduct this study from the IRB of Mahidol University. After the IRB committee granted permission, then the researchers sent letters of permission and co-operation to the Dean of Quaid-e-Awam University of Engineering, Science and Technology, Pakistan to ask for collecting data. After the Dean granted permission, then the researchers sent invitation letters and questionnaires to teachers and students. They were informed that they joined this study voluntarily.

### Research Tools:

The researcher constructed two separate sets of questionnaires: for teachers and students to use in this study. Questionnaires for both teachers and students were in English language because English is to be called medium of instruction in universities of Pakistan (Channa. 2012) [27]. The questions included in the questionnaires were of both closed and open ended forms using five point Likert scale where 5= Very extensive (VE),

4= Extensive (Ex), 3= Moderate (Mo), 2= Rarely (R), and 1= Least (L). The content validity of questionnaires was verified by three experts and reliability was .95, analysed by using Cronbach's alpha reliability coefficient. Ambiguity and errors were corrected, edited, and revised after pilot. Finally, those questionnaires were distributed to all subjects. After one week, answered questionnaires were collected. Total 207 students (95.3%) and 124 teachers (93.9%) returned the questionnaires. Therefore, the total returned rate of questionnaires was 94.8%. All returned questionnaires were checked for completion before key in data.

#### **Data Analysis**

Statistical used in the present study were arithmetic mean (*M*), and standard deviation (*SD*), and independent t-test. The independent t-test was employed to investigate the difference between students' needs and of their teachers' opinions.

#### **Results**

The results of this study were presented in Table 1-5

##### **1. Needs to use English language skills**

Students rated their needs of speaking and writing skills higher than their teachers did; whereas their teachers rated that their students needed listening and reading skills higher than their students did. Moreover, there was significant different of both students' and teachers' opinions on students' needs of speaking skills. Finally, the opinions of each group were not dispersed. See Table 1.

##### **2. Needs in listening skills**

Engineering students rated their extensive needs in listening of long lecture, presentation, complicate lecture, technical vocabulary, long conversation, short conversation, and general vocabulary higher than their teachers did; whereas

their teachers rated that their students needed presentation, long lecture, and long conversation. Moreover, there was significant different of both students' and teachers' opinions on students' needs of long conversation. Finally, the opinions of each group were not dispersed. See Table 2.

##### **3. Needs in speaking skills**

Engineering students rated their needs in speaking skills of long speaking, general vocabulary, complicate speaking, different situations, and short speaking, lecture/seminar, presentation/report in front of class, and dialogue dealing higher than their teachers did; whereas their teachers rated that their students needed general vocabulary, and different situations, long speaking, complicate speaking, lecture/seminar, and presentation/report in front of class. Moreover, there was significant different of both students' and teachers' opinions on students' needs of dialogue dealing ( $p < .05$ ). Finally, the opinions of each group were not dispersed. See Table 3.

##### **4. Needs in reading skills**

Engineering students rated their needs in reading of essay lower than their teachers did; while newspapers, text book, short passages and instructions for test, and long passages higher than their teachers did; whereas their teachers rated that their students needed essay higher than their students did; and text book, newspapers, and articles lower than their students rated. Moreover, there was significant different of both students' and teachers' opinions on students' needs of articles. Finally, the opinions of each group were not dispersed. See Table 4.

##### **5. Needs in writing skills**

Engineering students rated a very extensive need in writing essay, long paragraph, email/online chatting, summarize from reading,

short paragraph, general vocabulary and simple/complex sentences higher than their teachers did; whereas their teachers rated that their students needed long paragraph and summarize from listening, essay, general vocabulary and simple/complex sentences,

business letter/ fax/email, summarize from reading, and short paragraph. Moreover, there was significant different of both students' and teachers' opinions on students' needs of email/online chatting. Finally, the opinions of each group were not dispersed. See Table 5.

**Table 1** Needs in English skills of engineering students

English Skills	Students			Teachers			df	t	sig
	M	SD	level	M	SD	level			
Speaking	4.72	.44	VE	4.53	.61	VE	251.7	-2.1	.03
Writing	4.66	.60	VE	4.56	.66	VE	329	.62	.53
Listening	4.39	.86	VE	4.52	.76	VE	329	1.5	.13
Reading	4.37	.96	VE	4.45	.87	VE	329	1.6	.11

$p < .05$

**Table 2** Needs in listening skills of engineering students

Needs Skills	Students			Teachers			df	t	sig
	M	SD	Level	M	SD	Level			
Lecture (long)	4.52	.52	VE	4.33	.78	VE	329	-.69	.48
Presentation	4.33	.68	VE	4.33	.65	VE	329	-.48	.62
Lecture (complicate)	4.30	.64	VE	4.11	.86	Ex	329	-1.38	.17
Presentation at work	4.26	.66	VE	4.18	.68	Ex	329	.27	.79
Technical vocabulary	4.25	.67	VE	4.20	.70	Ex	329	.11	.91
Daily life: conversation (long)	4.20	.71	Ex	4.33	.69	VE	329	2.17	.03
Lecture (short)	4.09	.75	Ex	4.04	.87	Ex	329	-.14	.88
conversation (short)	4.01	.63	Ex	4.00	.61	Ex	329	-.48	.62
General vocabulary	4.00	.83	Ex	4.07	.67	Ex	329	.92	.35

Needs	Students			Teachers			df	t	sig
	M	SD	Level	M	SD	Level			
Listening Skills									
Meeting at work	3.96	.45	Ex	3.89	.56	Ex	329	.24	.81
Drama/movies (subtitle)	3.87	.83	Ex	3.72	.90	Ex	296.02	-1.40	.16
Inquiry	3.81	.65	Ex	3.73	.69	Ex	329	-.34	.73
Complain (customer)	3.71	.61	Ex	3.66	.67	Ex	329	-2.44	.02
English songs (subtitle)	3.60	.68	Ex	3.72	.83	Ex	235.6	1.20	.23
English songs (no subtitle)	3.56	.69	Ex	3.50	.78	Ex	329	.093	.10
Drama/movies (no subtitle)	3.48	.91	Ex	3.37	.92	Mod.	270.01	-2.04	.04

*p* < .05

**Table 3** Needs in speaking skills of engineering students

Needs	Students			Teachers			df	t	sig
	M	SD	Level	M	SD	Level			
Speaking skills									
Long speaking	4.54	.81	VE	4.16	1.02	Ex	186.90	-4.06	.00
Daily life: General vocabulary	4.46	.66	VE	4.40	.66	VE	329	.064	.94
Complicate speaking	4.45	.82	VE	4.10	1.00	Ex	329	-3.12	.00
Different situations	4.43	.65	VE	4.30	.64	VE	329	-1.45	.15
Short speaking	4.24	.76	VE	3.98	.91	Ex	329	-2.72	.01
Lecture/seminar	4.18	.68	Ex	4.08	.71	Ex	329	-2.41	.02
Presentation/report in front of class	4.15	.71	Ex	4.08	.67	Ex	329	-2.29	.02
Dialogue dealing	4.07	.75	Ex	3.79	.88	Ex	230.44	-3.70	.00
Learning: Technical vocabulary	3.87	.60	Ex	3.95	.62	Ex	329	1.08	.28
Horizontal conversations	3.72	1.04	Ex	3.69	.94	Ex	329	-.880	.38

Needs	Students			Teachers			df	t	sig
	M	SD	Level	M	SD	Level			
Speaking skills									
Grapevine	3.71	.88	Ex	3.59	.85	Ex	329	-2.07	.04
Working: Upward communications	3.61	.73	Ex	3.72	.78	Ex	329	.028	.10
Downward interactions	3.57	.79	Ex	3.62	.77	Ex	329	.100	.10

$p < .05$

**Table 4** Needs in reading skills of engineering students

Needs	Students			Teachers			df	t	sig
	M	SD	Level	M	SD	Level			
Reading skills									
Essay	4.21	.57	VE	4.32	.53	VE	329	1.55	.12
Daily life: Newspapers	4.18	.72	Ex	4.03	.77	Ex	329	.126	.90
Textbook	4.08	.70	Ex	4.09	.78	Ex	329	-.53	.59
Learning: Instructions for test	4.04	.67	Ex	3.93	.62	Ex	329	.080	.93
Passages (short)	4.04	.53	Ex	3.96	.64	Ex	228.88	1.60	.11
Passages (long)	4.03	.58	Ex	3.93	.67	Ex	329	1.22	.23
Advertisement	3.98	.87	Ex	3.77	.82	Ex	329	-.779	.43
Articles	3.98	.60	Ex	4.00	.72	Ex	213.66	2.55	.01
Memo	3.97	.75	Ex	3.83	.76	Ex	329	-1.20	.22
Magazines	3.96	.83	Ex	3.83	.76	Ex	329	.423	.67
Journals	3.93	.67	Ex	4.00	.72	Ex	329	1.33	.18
Manual	3.92	.73	Ex	3.87	.78	Ex	329	-.141	.88
Instructions for examination	3.90	.56	Ex	3.83	.51	Ex	329	-.288	.77
Working: Report	3.89	.85	Ex	3.90	.81	Ex	224.32	2.27	.02
Email	3.84	.78	Ex	3.55	.80	Ex	302.06	-1.705	.08
Novel	3.78	.72	Ex	3.55	.75	Ex	329	-1.20	.22
Web blog	3.73	.54	Ex	3.49	.62	Ex	329	-.995	.32

$p < .05$

**Table 5** Needs in writing skills of engineering students

Needs	Students			Teachers			df	t	sig
	M	SD	Level	M	SD	Level			
Writing skills									
Summarize from listening	4.36	.86	VE	4.20	.93	Ex	329	-1.81	.07
Essay	4.28	.85	VE	4.11	.85	Ex	329	-2.33	.02
Paragraph (long)	4.20	.79	Ex	4.20	.77	Ex	329	-.44	.65
Email/online chatting	4.16	.86	Ex	3.93	.87	Ex	329	-4.19	.00
Summarize from reading	4.13	.85	Ex	4.04	.90	Ex	273.88	-1.32	.18
Paragraph (short)	4.11	1.01	Ex	3.95	1.05	Ex	329	-1.23	.21
Simple/complex sentences	4.06	.69	Ex	4.09	.72	Ex	329	1.55	.12
Daily life: General vocabulary	4.06	.58	Ex	4.09	.51	Ex	329	1.52	.12
Working: Business letter/fax/email	4.00	.75	Ex	4.06	.69	Ex	329	.247	.80
Instructions	3.94	.81	Ex	3.90	.72	Ex	329	-.208	.83
Report	3.91	.82	Ex	3.77	.78	Ex	329	-.865	.38
Complaint	3.89	.80	Ex	3.74	.93	Ex	329	-1.41	.15
Web blog/email	3.85	.81	Ex	3.80	.84	Ex	329	-1.73	.08
Learning: Technical vocabulary	3.85	.91	Ex	3.70	1.05	Ex	329	.903	.36
Report	3.82	1.04	Ex	3.61	1.02	Ex	329	-1.65	.10
Mobile messages	3.79	1.08	Ex	3.74	1.07	Ex	329	-.29	.76
Meeting summary	3.67	.92	Ex	3.58	.99	Ex	235.41	-.88	.37

*p* < .05

## Discussion

The results of this study indicated the same needs for present and future as the participants rated all skills at very extensive and extensive need as the both approaches tend in the same direction. The results indicated that engineering students needed all four English language skills for their professional needs and future needs.

Both engineering students and teachers felt extensive needs in terms of listening to general vocabulary, long or short conversation, English songs with or without subtitles and drama/movie with or without subtitle in daily life; technical vocabulary, short, long and complicate lecture, and presentation in learning; presentation, meeting, inquiry and customer complain in working. The students seem to have a lot of opportunities to practice these skills of listening in order to meet present and future needs. Similarly, studies in other countries also show that their learners needed listening skills in terms of content in the target language (Zughul; & Hussain, 1985 [28]; Edwards, 2000) [17].

Similarly, Both, students and teachers perceived extensive needs in speaking different situations, general vocabulary, short, long, and complicate speaking, technical vocabulary, lecture/seminar, presentation/ report in front of class and dialogue dealing. The students rated a very extensive need of speaking skills that included long speaking, general vocabulary, complicate speaking, different situations, and short speaking. They had extensive need in speaking skills that included lecture/seminar, presentation/report in front of class, dialogue dealing, technical vocabulary, horizontal conversations, grapevine, upward communications, and downward interactions. Ming, Aziz; & Razak (2008) [18] indicated in an ESP speaking course in

Malaysia that learners needed speaking skills for oral presentations and classroom discussion.

In this study, engineering students found very extensive need in reading essay. They also observed that their extensive need in reading newspapers, text book, short passages and instructions for test, long passages, articles and advertisement, memo, magazines, journal, manual, instruction for examination, report, email, novel, and web blog. This corresponds with the findings of Hungarian study on English needs in which learners used the reading skills that include reading newspapers, text books, and online information (Kormos. 2002). (Soranastapom 1993) [19-20] also found that students needed reading skills for academic purposes. This study indicated that the engineering students felt a very extensive need in writing essay. They also perceived extensive needs in writing long paragraph, email/online chatting; summarize from reading, short paragraph, general vocabulary, simple/complex sentences, business letter/fax/email, instructions, reports, complaint, technical vocabulary, web blog and email.

## Conclusion

The purpose for this research was to identify needs of engineering students of QUEST. The findings revealed that the majority of participants felt extensive need to use four skills in daily, at learning, and at work. The findings were similar to Soranastaporn (1993) and Samawathdana (2009) [20-21] which revealed that most participants agreed that English is important for their academic development. The results also indicated that engineering students needed all four English language skills for their professional needs and future needs. The findings showed that the majority of participants accepted that writing skills were the biggest need in their work, followed by speaking skills and listening skills.

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