

## **Ambiguities in English Language Teaching: Designing English for Specific Purposes Courses for a Discipline-Specific Context**

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### **ABSTRACT**

The need for English language teaching to address specific language needs for a discipline has instigated growing demands for English for Specific Purposes (ESP) courses in higher education institutions in Malaysia. In the context of a university which focuses on engineering programmes, monitored by an engineering professional body, ESP courses designed and developed for higher education are expected to include learning outcomes which reflect integration between English language and engineering fields. In other words, these English language courses need to address the language needs in the engineering field. Thus, English language educators within this context need to have relevant knowledge and skills to enable them to design and develop appropriate ESP courses. Questions arise in relation to how English language courses developed have addressed this expectation. This paper examines the extent to which this expectation is translated into the ESP courses at one technical university in Malaysia. The findings showcase how this expectation is disseminated to the English language educators. This paper provides insight into the complex process of designing English language courses that could address the language needs of the engineering field. In addition, this paper highlights aspects to consider when designing an ESP course for a specific discipline.

*Keywords:* English for Specific Purposes (ESP), case study, Engineering Accreditation Manual (EAM), Malaysian Qualifications Framework (MQF)

### **1.0 INTRODUCTION**

Globalisation has elevated the need for English language as the medium of global interactions in various industries such as in business, science and engineering. In the engineering profession, for example, excellent communication skills are needed for employees to cope effectively with the work demands in their fields. In one survey conducted with employers in the engineering industry in the USA, it was found that 60% of employers ranked communication as the most essential skill (Nicometo *et al.*, 2010). Thus, when recruiting, employers no longer seek candidates who only display high academic achievements. Instead, they seek candidates who are able to apply knowledge and demonstrate skills relevant for a workplace in a particular field.

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The increasing need for communication skills in the engineering field has led engineering accreditation criteria worldwide to be revised to support the development of communication skills (ABET, 2009; 2010; Bradley, 2010). In Malaysia, the quality of engineers and engineering education is monitored by the Board of Engineers Malaysia (BEM). The change in job demands has triggered BEM to redevelop its requirements and criteria for accreditation (Engineering Accreditation Council, 2007). As engineering programmes need to comply with these criteria to be accredited, these accreditation criteria impact greatly on the development of engineering education (ABET, 2009; 2010; Bradley, 2010).

The adoption of the revised criteria of the Board of Engineers Malaysia (BEM) has prompted universities in Malaysia to restructure engineering education and reconstruct the engineering academic curriculum to support the achievement of graduate outcomes (Engineering Accreditation Council, 2012). While the focus on fundamentals of engineering has not decreased as a result of this process, the changes to the content courses led to an increase in focus on communication skills in English in higher education institutions. These requirements and criteria shifted an education system which focused largely on acquisition of engineering fundamentals, to an education system which balanced the acquisition of knowledge with the development of soft skills (Aziz *et al.*, 2006; Hashim & Mohd Din 2009). As a result of this shift, teaching and learning in engineering education started to emphasise the development of soft skills including communication skills and English language abilities (Hashim & Mohd Din, 2009). This shift has changed the focus of English language teaching from teaching grammatical and linguistic aspects of the language to teaching English for specific purposes (ESP) and for specific disciplines (Vathia, 2007; Basturkmen, 2012) This paper examines the extent to which these requirements are translated into the English language courses at one technical university in Malaysia.

## **2.0 ENGLISH LANGUAGE TEACHING IN ENGINEERING DISCIPLINES**

English has, undeniably, been acknowledged as the global language for communication in the engineering industry (Riemer, 2007). In Malaysia, English maintains second language status and in higher education English is the medium of instruction (EMI) for teaching and learning in science and technology courses, including engineering. In addressing the demand for English in various industries, English language teaching for specific purposes has been growing in many non-English speaking countries such as Japan, Taiwan and Nigeria, since the 1990's (Hou, 2013; Shi, 2013; Umera-Ukeke, 2014). Continuous research has been conducted to determine the language needs of various industries and to what extent ESP programmes in non-English speaking countries have addressed English for global interactions in the workplace.

Studies of English for Specific Purposes (ESP) have acknowledged the existing complexities in meeting the needs of students from various academic disciplines in English language teaching (Bhatia, 2007; Medra & Rus, 2012; Popescu, 2012). Responding to the revised requirements in engineering accreditation have raised challenges in developing ESP courses which can most effectively support the development of English language abilities and communication skills for engineering. The design of these ESP courses should be domain-specific to motivate students to participate actively in the

learning process, and to see the relevance of these courses in their engineering programmes (Baik & Greig, 2009; Kirkgoz, 2009).

ESP courses are generally developed based on common communicative events that occur in various professional arenas (North, 2005). Since such courses are not designed for a specific discipline, they may be insufficient to cater for students' language needs as these needs vary across disciplines (Kuteeva & Airey, 2013; Hyland, 2002). In addressing the challenge in developing ESP courses for engineering, the course designers who are generally the English language educators with ESL background, need to develop clear understandings of ESP knowledge of academic or workplace discourses, and the skills to translate this knowledge into instructional practices (Grosse & Vought, 2012; Mustapha & Yahya, 2013). These educators are well-equipped with linguistic knowledge and the pedagogies for teaching the language. However, they may lack understanding about language in a workplace or a discipline. Thus, the concept of ESP may not be well understood by them. In addition, English language educators need to be informed about the language demands of specific disciplines, in this case, the requirements and the criteria outlined by BEM. Nonetheless, they may not come from engineering backgrounds and thus, may not understand these demands effectively. With limited understanding of the nature of ESP, as well as knowledge about the language demands in engineering, English language educators may perceive their role only as language educators (Tan, 2011). This suggests challenges in designing and developing ESP courses which effectively address the demands in engineering profession.

Gabrielli *et al.* (2012) conducted an investigation on contextualised English language teaching and learning into maritime engineering at a university in Sweden. Two English for Maritime Engineering courses were developed. The first course concerned basic English language skills which included vocabulary and grammar, as well as oral and written skills for various technical contexts while the second course focused on technical language. Elements of the language and communication skills of these two courses were incorporated into two maritime engineering courses in year two and another two maritime engineering courses in year three. Students were expected to apply the language and communication skills they acquired from English language courses to the maritime engineering courses. The researchers reported that there was a disconnection between the language discourse learnt in classrooms and the language discourse in the workplace. They argued that the ESP courses needed to be contextualised through integrating language and maritime engineering content. The need for contextualised English language courses requires English language educators to have some knowledge or resources related to an engineering discipline, and of the language discourse of that particular discipline in real life contexts. The mismatch highlighted by Gabrielli *et al.* (2012) raises issues about dissemination of requirements and expectations of engineering industry to educators, particularly to English language educators.

This section has highlighted the need for English language educators to have clear understanding of engineering workplace and discourse, as well as the demands in engineering profession in order to develop ESP courses relevant for engineering. This raises questions about the extent to which the requirements and criteria outlined by BEM were understood by the English language educators. Examining the ESP course syllabus could provide knowledge about the complexities of developing the ESP course syllabus in such a context.

### **3.0 METHODOLOGY**

#### **3.1 Research Design**

This study adopted a case study design because the aim was to examine the ways in which English language educators understood the requirements by the engineering professional body, BEM, and the extent to which they perceived the need to reflect the requirements of the engineering professional body. A case study research design is useful to investigate a phenomenon in its real life context and has the ability to capture the complex nature of the phenomenon being investigated (Cousin, 2005; Johnson & Christensen, 2004; Neuman, 2008; Silverman & Marvasti, 2008; Yin, 2014). Stake (2005) identifies intrinsic and instrumental as types of case studies. Intrinsic case studies explore a specific or unique situation to provide answers to the questions related to that particular situation (Yin, 2011). The purpose is to provide an understanding of the situation, not for theory building (Stake, 2005).

In capturing human perceptions, interactions, activities and decisions in real world settings, the investigation required a naturalistic approach to data collection. In other words, the data collection process did not attempt to intervene or manipulate the phenomenon under investigation (Gay, Mills & Airasian, 2012; Patton, 2002). In order to obtain insights related to English language educators' perceptions and interactions, document studies and interviews were used (Denzin & Lincoln, 2005; Swanborn, 2010).

#### **3.2 Documents**

Documents were collected as they provided an understanding of the setting in terms of the nature of engineering accreditation, the requirements in engineering education, the structure of engineering academic curriculum and the nature of the English language courses. They were stable and outside the researcher's influence (Swanborn, 2010; Marshall & Rossman, 2006). They were also unobtrusive in the sense that they were not influenced by the participants' or the researcher's points of view of the issue (Gay, Mills and Airasian, 2012). In this study, the documents provided an understanding of the expectations within engineering contexts which created a connection with what was being understood by the English language educators in developing and teaching the English language courses. The details of the documents which were collected are displayed in Table 1.

The documents from external sources were those received from the Board of Engineers (BEM) and the Malaysian Qualification Agency (MQA). The documents from BEM provide guidelines and procedures for restructuring the engineering academic curriculum at university level. These documents were directly involved with the engineering accreditation process. The documents from MQA provide information about the requirements by the Ministry of Higher Education that all university programmes need to fulfil. These documents were not directly involved with engineering accreditation.

**Table 1** Documents Collected for this Study

		<b>Documents</b>	<b>Descriptions</b>
<b>External</b>	<b>Engineering Accreditation Council (EAC)</b>	Engineering Accreditation Manual (EAM)	This document provided information about the graduate outcomes, setting up an engineering programme, the requirements for academic curriculum and student enrolment, and the criteria and procedure for the engineering accreditation process.
	<b>Malaysian Qualification Agency (MQA)</b>	Malaysian Qualification Framework (MQF)	This document provided information related to the requirements by the Ministry of Higher Education.
<b>Internal</b>	<b>University</b>	The University Outcomes	This document provided the list of university outcomes that were required to be incorporated into the programme educational outcomes and programme learning outcomes of each engineering programme.
	<b>Academic Department (AD)</b>	Programme Descriptions for Engineering Programmes	These documents described the design and the structure of an engineering programme which included the programme educational outcomes, the programme learning outcomes, the academic curriculum, the requirements for student enrolment, the courses within a curriculum, and the mapping of university outcomes that needed to be achieved by each course.
	<b>English Language Department</b>	The English Language Course Syllabus The English Language Course Outlines	These documents provided the descriptions of the English language courses, the topics and the content for the English language courses, the course learning outcomes, and the assignments/tasks for each course.

The documents from the internal sources were divided into two categories. The documents for the first category were collected from the university management and engineering faculties and were those directly involved in engineering accreditation processes. These documents were produced based on the

guidelines in the engineering accreditation manuals. They were used to develop engineering programmes which met the requirements of engineering accreditation.

The documents for the second category were not directly related to the engineering accreditation process. They were the English language course syllabus and the English language course outline that provided English language educators with information about the descriptions of the English language courses, the topics and the content for the English language courses, the course learning outcomes, and the assignments/tasks for each course. These documents, which were created by the English language educators at departmental level, were the internal sources as they guided the EL educators' teaching and learning in engineering contexts.

## **4.0 FINDINGS AND DISCUSSIONS**

### **4.1 Understanding the Complexities of Structuring Engineering Programmes**

The analysis of the Engineering Accreditation Manual (EAM) revealed that the Board of Engineers Malaysia (BEM), an engineering professional body, is responsible for maintaining the standard of engineering programmes in Malaysia. The Engineering Accreditation Council (EAC) was established to manage the accreditation process and the EAM was developed to provide guidelines on the requirements to ensure that engineering programmes and engineering students graduating from these programmes have fulfilled the industry demands for engineering. The outcome of this is that BEM, through EAC, has control over how an engineering programme is structured.

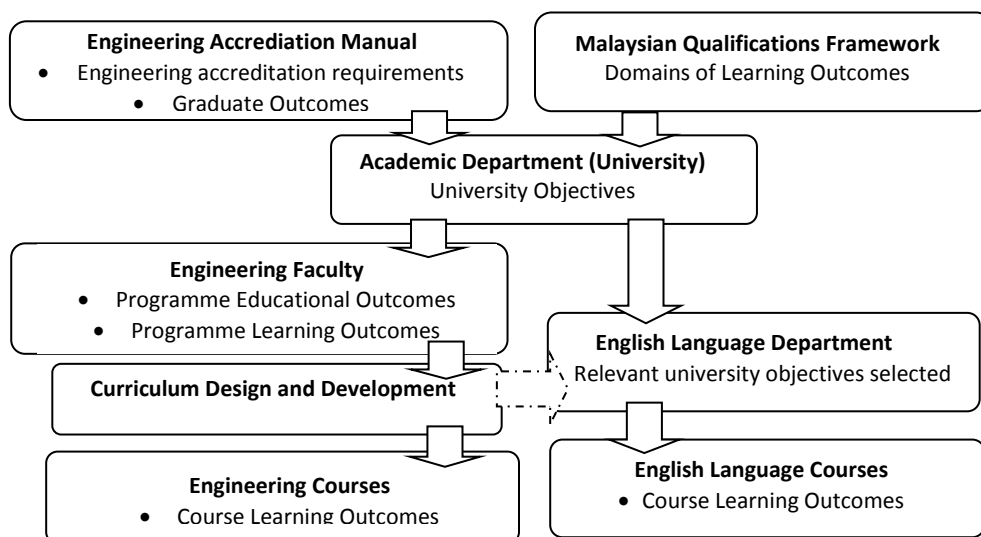
The EAC is a 15-member committee that includes a representative from the Ministry of Higher Education and from the Public Service Department. The remaining 13 members are from engineering industries including BEM, and employers of engineering industries. The expertise and experience of members suggests that the EAC and the requirements to maintain the standard of engineering education are dominated by the engineering market. This market focus has a major impact on the structure of the engineering curriculum at this university.

The impact of accreditation on engineering programmes is complicated by the need for all universities to meet the education quality requirements set by the Ministry of Higher Education (MOHE). To achieve this, the Malaysian Qualifications Framework (MQF) was developed and the Malaysian Qualifications Agency (MQA) is responsible for monitoring and ensuring that all programmes in higher education meet these requirements. Therefore, while the university needs to address the demands of engineering industries, it also needs to abide by the requirements set by the MOHE. This suggests that there is an interplay between the EAM and the MQF when structuring engineering programmes and developing academic curriculum for these programmes. The next section discusses this interplay.

### **4.2 Translating the Graduate Outcomes into Engineering Education**

The Engineering Accreditation Manual (EAM) lists 10 graduate outcomes which engineering students should achieve by the end of their programmes. The Malaysian Qualifications Framework (MQF) also

presents the domains of learning outcomes which need to be incorporated into all engineering programmes. The summary of the process of translating the graduate outcomes (EAM) and the domains of learning outcomes (MQF) into the university outcomes, programme educational outcomes (engineering faculties) and course learning outcomes (English Language Department) is presented in Figure 1.



**Figure 1** The process of translating the graduate outcomes and domains of learning outcomes into course learning outcomes

Based on Figure 1, the graduate outcomes (of EAM) and the domains of learning outcomes (of MQF) are interpreted and adapted to develop the university objectives at the university level, through the Academic Department. The Academic Department is an administrative department which manages the dissemination of requirements for quality assurance and accreditation for all programmes and ensuring that these requirements are fulfilled. This department is also responsible for reviewing and approving applications for new programmes at university level before these applications are submitted to the ministry. In addition, this department is in charge of translating the outcomes outlined in the Engineering Accreditation Manual (EAC/BEM) and the Malaysian Qualification Framework (MQA/MOHE) into the university outcomes. The process of adapting both the graduate outcomes and the domains of learning outcomes at the Academic Department level is the first layer of filtering of the engineering accreditation requirements. These university outcomes are then disseminated to all faculties (Table 2).

At the English Language Department level, the university objectives are provided to the course designers, who are the English language educators at this department and who may or may not teach the courses they helped develop. When designing and developing the English language courses, the university objectives were interpreted, adapted and developed further to represent outcomes related to English language teaching. This suggests that the dissemination process of the graduate outcomes and the learning domains passed through an initial process of interpreting, adapting and translating

at university level, and then a second layer of interpretation, adaptation and translation at the English Language Department level. This raises double layering questions about the accuracy of mapping the course learning outcomes to the graduate outcomes envisioned in EAM and the domains of learning outcomes outlined in the MQF.

At the engineering faculty level, the academic curriculum is designed based on the requirements in the EAM and the MQF, and the programme educational outcomes (PEO) and the programme learning outcomes (PLO) are developed based on the graduate outcomes and the domains of learning outcomes. The programme educational outcomes are outcomes which graduates are expected to achieve within seven years of graduation in their career and professional life while the programme learning outcomes are the outcomes which graduates are expected to achieve upon graduation. In other words, students should be able to apply the knowledge and skills they learnt and developed during their study to their workplace. This process provides another layer of dissemination of the requirements of engineering accreditation and the graduate outcomes which may create a mismatch between the type of ESP courses expected at engineering faculties and the ESP courses designed and developed at the English Language Department level.

### **4.3 Positioning English Language Courses in Engineering Academic Curriculum**

There are three English language courses designed to fulfil the requirement for the general education components in the engineering academic curriculum. These courses are Academic English (AE), Communication (C) and Technical Writing (TW). While the Communication and Technical Writing are compulsory for all engineering students, Academic English is only compulsory for students who have not yet obtained a Band 3 score on the Malaysian University English Test (MUET) upon admission.

At the time this research was conducted, Academic English was taught in the first semester of the first year in the academic curriculum of the engineering programme. This course was designed to improve students' proficiency in English. The content included activities which involve listening, speaking, reading and writing skills. Each skill is addressed for two to three weeks to prepare students for MUET to help students achieve at least a Band 3 to allow them to graduate with proficiency levels required by the university. In this case, English language teaching emphasised language development in terms of English language proficiency and the design of the course emphasised performance of English language for examination purposes. This design has diffused the demand for ESP by the engineering accreditation requirements in order to address the requirements by the university, raising inconsistencies between the engineering accreditation requirements and the university requirements. The Communication course was situated in the second semester of the first year of the engineering programme. It was designed for communicative purposes and the content included communicative events such as writing memos and minutes of meetings, holding meetings, interviews and setting up an imaginary business. These communicative events are common events that can be found in various professions, not only in engineering. In addition, these communicative events were not contextualised for engineering contexts. Based on this finding, the course could be identified as an ESP course. However, the type of ESP course developed may not align with the type of ESP envisioned by the requirements of the engineering accreditation.



**Table 2** Graduate Outcomes, Domains of Learning, and University Objectives

<b>Graduate Outcomes (GO) (Engineering Accreditation Manual)</b>	<b>Domains of Learning Outcomes (DLO) (Malaysian Qualification Framework)</b>	<b>University Objectives (UO) (University Policy)</b>
Students of an engineering programme are expected to attain the following:		Graduates who have:
1. Ability to acquire and apply knowledge of science and engineering fundamentals;	1. Mastery of body of knowledge	1. Acquired and are able to apply knowledge of science and engineering fundamentals (fundamental knowledge);
2. Ability to communicate effectively, not only with engineers but also the community at large;	2. Practical skills	2. Acquired in-depth technical competence in a specific engineering discipline (technical competence);
3. Acquired in-depth technical competence in a specific engineering discipline;	3. Social skills and responsibilities	3. An ability to communicate effectively/use ICT effectively (communication);
4. Ability to undertake problem identification, formulation and solution;	4. Values, attitudes and professionalism	4. An ability to use techniques, skills and modern engineering tools necessary for engineering practice and easily adaptable to industrial needs (adaptability);
5. Ability to utilise systems approach to design and evaluate operational performance;	5. Communication, leadership and team skills	5. An ability to identify problems, create solutions, innovate and improve current practices (problem solving);
6. Understanding of the principle of design for suitable development;	6. Problem solving and scientific skills	6. An understanding of professional and ethical responsibilities and commitment to the community (ethics);
7. Understanding of professional and ethical responsibilities and commitment to them;	7. Information management and lifelong learning skills	7. A recognition of the need for, and an ability to engage in, life-long learning - adaptability to new situations and demands by applying and/ or updating knowledge and skills (life-long learning);
8. Ability to function effectively as an individual and in a group with the capacity to be a leader or manager;	8. Managerial and entrepreneurial skills	8. An ability to function effectively in groups in ways that contribute to effective working relationships and the achievement of goals both as a leader as well as an effective team player (team work);
9. Understanding of social, cultural, global and environmental responsibilities of a professional engineer;		9. An ability to have an international perspective on social, cultural, global and international responsibilities of a professional engineer and the need for sustainable development (social awareness);
10. Recognising the need to undertake life-long learning, and possessing/acquiring the capacity to do so.		10. An ability to appreciate aesthetic values through development and applications of personal judgement (appreciation of aesthetic values)

The third course, Technical Writing, was offered in the first semester of the second year of the engineering programme. It was designed to introduce students to writing reports and conducting small scale research. Similar to the communication course, this course was also designed for communicative purposes emphasising English language writing competence for specific purposes. The learning outcomes indicated that this course was intended for specific purposes, but not for a specific discipline such as engineering. The learning outcomes and the content were not contextualised for engineering disciplines, nor did they include language discourse specific to engineering.

Table 3 shows the cross referencing between the course learning outcomes (CLO) of English language courses and the university objectives as well as the programme learning outcomes of all engineering faculties. The programme learning outcomes (PLO) in this table were taken from the engineering programme description prepared by each engineering faculty, indicating that these were the outcomes that English language courses need to address.

Table 3 reveals inconsistencies between the programme learning outcomes (PLO) the engineering faculties expected English language courses to achieve and the course learning outcomes developed at the English Language Department level. For example, the Technical Writing course was expected to address Civil(PLO)1 *students have acquired and able to apply knowledge of science and engineering fundamentals in civil engineering*. This indicated that the content of this course should be integrated with engineering content. However, this intention was not evident in any of the Technical Writing course outlines. Additionally, none of the course learning outcomes of English language courses explicitly articulated that these courses should address problem solving skills, English language or communication skills for engineering. The expectations that English language courses should be specified for a particular discipline were not made clear to the English Language Department. This creates mismatches between the nature of the English language courses and the graduate outcomes of the EAM and engineering faculties' expectations. This also raises questions about the type of English language courses that need to be developed and the knowledge that English language educators need to have to teach English for engineering contexts.

The Engineering Accreditation Council (EAC) had not emphasised performance in English language abilities for the enrolment requirements and similarly the university had also not set a high English proficiency entry requirement. Students with low English language proficiency levels were able to enrol in an engineering programme as long as they had good results for their science subjects and as long as they had undertaken their MUET, regardless of their results. The graduate outcomes of EAC and the programme learning outcomes of engineering faculties indicated that engineering students were expected to develop communication skills in English for Engineering upon graduation. This means that English language educators are expected to develop students' communication skills and improve their abilities in English language in engineering in the first two years of an engineering programme. This expectation raises questions about how English language teaching can meet the demand for ESP and address students' low proficiency levels in English simultaneously in three semesters.

In the first two years of their programme, students were provided with general education and skills relevant to engineering contexts, followed by basic engineering towards the end of the second year. This was expected to scaffold students' learning of more complex engineering fundamentals during their third and fourth years. During the first two years, students were exposed to working in groups,

as well as individually, to communicating effectively among group members and lecturers, to holding meetings and discussions, to performing presentations and writing reports in all general education components, specifically in English language courses. In their final year, students produced a project which required the application of all the knowledge and skills not only of engineering fundamentals, but also of their general education components

Three issues arise within the context of English language teaching based on the locations of the English language courses in the engineering academic curriculum. First, developing ESP courses for engineering was not possible because the English language courses were situated at locations within the programme where students had not yet learnt the fundamentals of engineering. Second, there was a large gap between the communication and language skills taught during their first three semesters and the requirements for the application of these language skills in their final semester when they undertook their project. Thus, these issues create challenges in understanding the need for ESP for engineering, in developing ESP courses and in establishing English language teaching as ESP for engineering.

## 5.0 CONCLUSION

Addressing the demands for knowledge application, communication skills and problem solving skills in the English language courses require English language courses to be ESP courses, specifically for engineering. However, this could not be observed in the learning outcomes or the syllabus of the English language courses. Although the English language courses at this university were meant to be for specific purposes, they were not designed for engineering. The learning outcomes of the English language courses aimed to develop students' communication skills for general contexts with the expectation that these communication skills could be applied to various contexts or disciplines. Hyland (2002) argued that designing English language courses which were meant to be for a specific purpose, and for a specific context, but turned out to be English language applicable for various contexts, was common in the context of foreign language settings. He argued that this could occur when English language courses were "marginalised as a remedial exercise;" similarly designed to address students' language problems specifically in their low proficiency in English language (p. 386). This study has highlighted the complexities of disseminating requirements and expectations of the university stakeholders, in this case, the engineering professional body and the Ministry of Higher Education. The multi-layers of the dissemination process have caused ambiguities at the English Language Department, particularly in terms of designing and developing ESP courses relevant for engineering. Thus, ways in which these layers could be lifted are needed to reduce ambiguities when designing and developing the these ESP courses.

**Table 3** Cross-Referencing the Learning Outcomes of English Language Courses with the University Objectives and the PLOs Assigned to English Language

Items	Communication (C)	Academic English (AE)	Technical Writing (TW)
<b>Criteria</b>	No pre-requisite. Compulsory for all students	Compulsory for students who achieved less than band 3 in MUET	Pre-requisite – Communication course. Compulsory for all students.
<b>Course Learning Outcomes</b>	<ul style="list-style-type: none"> <li>a) To develop English language competence for oral and written communication in a wide range of contexts.</li> <li>b) To train students in working collaboratively with people of various cultures and professional backgrounds.</li> <li>c) To develop lifelong learning skills for continuous personal and professional development.</li> </ul>	<ul style="list-style-type: none"> <li>a) To develop English language communicative competence for academic purposes.</li> <li>b) To train students to work collaboratively with people of various cultures and professional backgrounds.</li> <li>c) To develop lifelong learning skills for continuous personal and professional development.</li> </ul>	<ul style="list-style-type: none"> <li>a) To develop English language writing competence for specific purposes,</li> <li>b) To develop lifelong learning skills for continuous personal and professional development.</li> <li>c) To train students in working collaboratively with people of various cultural and professional backgrounds.</li> </ul>
<b>University Objectives</b>	<p><b>U01:</b> Have acquired and able to apply knowledge of science and engineering fundamentals.</p> <p><b>U03:</b> Able to communicate effectively.</p> <p><b>U05:</b> Able to identify problems, create solutions, innovate and improve current practices.</p>	<p><b>U01:</b> Have acquired and able to apply knowledge of science and engineering fundamentals.</p> <p><b>U03:</b> Able to communicate effectively.</p> <p><b>U06:</b> Understanding of professional and ethical responsibilities and commitment to the community.</p>	
<b>Mechanical</b>	<p><b>PL01:</b> Acquire adequate knowledge and technical competency in mechanical engineering and its related disciplines.</p> <p><b>PL05:</b> Perform effectively in team work environment.</p> <p><b>PL06:</b> Acquire self-learning and information management capability, enabling life-long learning.</p>	<p><b>PL01:</b> Acquire adequate knowledge and technical competency in mechanical engineering and its related disciplines.</p> <p><b>PL03:</b> Communicate effectively using a variety of appropriate mediums.</p> <p><b>PL06:</b> Acquire self-learning and information management capability, enabling life-long learning.</p>	
<b>Civil</b>	<p><b>PL01:</b> Acquire and apply knowledge of sciences and engineering fundamentals in civil engineering field.</p> <p><b>PL03:</b> Communicate effectively both in written and spoken forms with engineers, other professionals and community.</p> <p><b>PL05:</b> Function individually or in teams effectively with the capacity to be a leader.</p>	<p><b>PL01:</b> Acquire and apply knowledge of sciences and engineering fundamentals in civil engineering field.</p> <p><b>PL03:</b> Communicate effectively both in written and spoken forms with engineers, other professionals and community.</p> <p><b>PL06:</b> Recognise the need for and to engage in, life-long learning and professional development.</p>	
<b>Electrical</b>	<p><b>PL01:</b> Acquire and apply knowledge of mathematics, sciences and engineering fundamentals in electrical and electronic engineering field.</p> <p><b>PL03:</b> Communicate both in written and spoken forms with engineers, other professional and the community at large.</p> <p><b>PL05:</b> Function effectively individually or in teams with the capacity to be a leader.</p>	<p><b>PL01:</b> Acquire and apply knowledge of mathematics, sciences and engineering fundamentals in electrical and electronic engineering field.</p> <p><b>PL03:</b> Communicate both in written and spoken forms with engineers, other professionals and the community at large.</p> <p><b>PL0 6:</b> Recognise the need for, and to engage in, life-long learning and professional development.</p>	

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