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AN ANA[illegible]CAL ORAL PRESENTATION ANXIETY IN ENGLISH AMONG ENGINEERING STUDENTS IN UNIVERSITI MALAYSIA PAHANG

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AN ANALYSIS OF TECHNICAL ORAL PRESENTATION ANXIETY IN ENGLISH AMONG ENGINEERING STUDENTS IN UNIVERSITI MALAYSIA PAHANG

by

NOOR RAHA MOHD RADZUAN

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LIST OF ABBREVIATIONS

AAT	:Achievement Anxiety Test
ABET	:Accreditation Board of Engineering and Technology
CMLHS	:Centre for Modern Languages and Human Sciences
COM	:Communication-Orientation Modification
EAC	:Engineering Accreditation Council
EAP	:English for Academic Purposes
EMARS	:Electronic Mathematics Anxiety Rating Scale
EFL	:English as a Foreign Language
ESL	:English as a Second Language
ESOPS	:Engineering Students Oral Presentations
ESP	:English for Specific Purposes
FCNRE	:Faculty of Chemical and Natural Resources Engineering
FL	:Foreign Language
FLCAS	:Foreign Language Classroom Anxiety Scale
GPA	:Grade Point Average
L1	:First language
L2	:Second Language
MARS	:Mathematics Anxiety Rating Scale
MEES	:Malaysian Engineering Employability Skills
MoHE	:Ministry of Higher Education
OCA	:Oral Communication Apprehension
OPQ	:Oral Presentation Questionnaire
PET	:Processing Efficiency Theory
PRCA-24	:Personal Report of Communication Apprehension
PRCS	:Report of Confidence as a Public Speaker
PRPSA-34	:Personal Report of Public Speaking Anxiety
SCT	:Social Cognitive Theory
SPSS	:Statistical Package for Social Sciences
STAI	:State Trait Anxiety Inventory
TAI	:Test Anxiety Inventory
TOP	:Technical Oral Presentation
UMP	:Universiti Malaysia Pahang
URP	:Undergraduate Research Project
URPII	:Undergraduate Research Project II

SATU ANALISIS TENTANG KERESAHAN DALAM PEMBENTANGAN LISAN TEKNIKAL DALAM BAHASA INGGERIS DALAM KALANGAN PELAJAR KEJURUTERAAN DI UNIVERSITI MALAYSIA PAHANG

ABSTRAK

Kajian ini bertujuan menganalisis keresahan pelajar kejuruteraan semasa menjalani pembentangan lisan teknikal dalam bahasa Inggeris dalam konteks pendidikan kejuruteraan kimia. Kajian ini juga mengenal pasti faktor-faktor yang menyebabkan wujudnya perasaan resah dalam kalangan pelajar semasa pembentangan lisan teknikal berkenaan. Kajian ini mendasari Social Cognitive Theory (Bandura, 1986), Processing Efficiency Theory (Eysenck & Calvo, 1992) dan Recursive Framework of Anxiety, Cognition and Behaviour (MacIntyre, 1995) untuk membincangkan keresahan dalam kalangan pelajar kejuruteraan semasa pembentangan lisan teknikal. Konsep Communication Apprehension (McCroskey, 1982b) juga digunakan untuk membincangkan keresahan yang dialami oleh pelajar semasa pembentangan lisan teknikal bahasa Inggeris. Kajian kes ini turut mengaplikasikan pendekatan gabungan (mixed method sequential explanatory approach) yang diperkenalkan oleh Creswell (2003). Dua bentuk soalan soal selidik iaitu Personal Report of Public Speaking Anxiety (PRPSA-34) (Richmond & McCroskey, 1998) yang telah disesuaikan untuk kajian ini dan Personal Report of Communication Apprehension (PRCA-24) yang diketengahkan oleh McCroskey (1982a) digunakan dalam kajian ini. Selain itu, analisis dokumen dan temu bual separa struktur juga telah dijalankan terhadap sampel kajian. Sampel kajian ini melibatkan 135 orang pelajar tahun akhir, enam orang pensyarah Fakulti Kejuruteraan Kimia dan Sumber Asli, Universiti Malaysia

Pahang dan tujuh orang wakil industri dalam bidang kimia. Dapatan kajian ini menunjukkan hampir sebahagian daripada jumlah responden (46.7%) menghadapi keresahan pada tahap tinggi dan sederhana semasa pembentangan lisan teknikal dalam bahasa Inggeris. Keputusan juga menunjukkan majoriti responden (73.3%) mengalami tahap keresahan yang sederhana semasa berkomunikasi secara lisan dalam bahasa Inggeris. Walau bagaimanapun, kebanyakan responden mengalami keresahan tahap tinggi semasa memberikan pengucapan awam. Analisis statistik menunjukkan korelasi negatif yang lemah antara tahap keresahan para pelajar semasa pembentangan lisan teknikal dalam bahasa Inggeris dan skor ujian pembentangan lisan PSM II. Keputusan juga menunjukkan para pelajar mencapai markah yang tinggi dalam ujian pembentangan lisan teknikal dalam bahasa Inggeris, walaupun kebanyakan pelajar mengalami keresahan tahap tinggi dan sederhana semasa pembentangan lisan itu. Selain itu, temu bual fokus bersama enam kumpulan pelajar dan temu bual secara individu bersama para penilai juga dijalankan. Dapatan menunjukkan persamaan dan perbezaan dari segi persepsi terhadap faktor-faktor yang menyebabkan keresahan para pelajar semasa pembentangan lisan teknikal dalam bahasa Inggeris. Kedua-dua kumpulan berpendapat bahawa pengetahuan teknikal yang cetek, barisan penilai dan kekangan kemahiran dalam bahasa Inggeris merupakan penyumbang besar yang mempengaruhi keresahan para pelajar semasa menjalani pembentangan lisan teknikal dalam bahasa Inggeris. Para penilai juga melihat faktor-faktor seperti kurang kemahiran pembentangan lisan dan tidak cukup persediaan turut menyebabkan keresahan dalam kalangan pelajar. Namun demikian, para pelajar tidak mempunyai pandangan yang sama. Mereka berpendapat bahawa faktor penyelia, masa dan persepsi negatif terhadap pembentangan lisan teknikal

menjadi penyumbang terhadap keresahan yang dialami oleh mereka. Kajian ini merupakan hasil lanjutan dari kajian lepas dengan menggunakan pengalaman sebenar pelajar semasa pembentangan lisan teknikal dalam bidang English for Specific Purposes (ESP). Kajian secara mendalam melalui perspektif para pelajar dan penilai terhadap faktor-faktor penyumbang keresahan para pelajar juga menyokong dan menambahkan kefahaman terhadap topik kajian ini.

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AN ANALYSIS OF TECHNICAL ORAL PRESENTATION ANXIETY IN ENGLISH AMONG ENGINEERING STUDENTS IN UNIVERSITI MALAYSIA PAHANG

ABSTRACT

This main aim of this study was to analyze the anxiety experienced by engineering students in delivering effective technical oral presentations (TOP) in English in the context of chemical engineering education. It also investigated the factors that may have contributed to the students' feelings of anxiety. This study draws on the Social Cognitive Theory (Bandura, 1986), Processing Efficiency Theory (Eysenck & Calvo, 1992) and the Recursive Framework of Anxiety, Cognition and Behaviour (MacIntyre, 1995) in discussing engineering students' technical oral presentation anxiety. In addition, the concept of Communication Apprehension (McCroskey, 1982b) was used as a basis in further understanding the anxiety experienced by the students in technical oral presentation and oral communication in English as a second language (ESL). This case study used a mixed method sequential explanatory approach proposed by Creswell (2003). Two questionnaires were used in this study: (1) an adapted version of Personal Report of Public Speaking Anxiety (PRPSA-34) (Richmond & McCroskey, 1998) questionnaire and (2) the Personal Report of Communication Apprehension (PRCA-24) (McCroskey, 1982a) questionnaire. Other instruments used were semi-structured interviews and document analysis. The sample comprised 135 final year engineering students and 6 lecturers from the Faculty of Chemical and Natural Resources Engineering (FCNRE) in Universiti

Malaysia Pahang (UMP) as well as 7 industry personnel from chemical-related industries. Results showed that almost half of the respondents (46.7%) experienced high and moderately high anxiety in delivering technical oral presentations in English. Results also showed that majority of the respondents (73.3%) reported feeling moderately apprehensive in communicating orally in English and most respondents were highly anxious when giving speeches in public. Statistical analysis shows a negative weak correlation between the students' levels of TOP anxiety and their URPII final oral presentation scores. Results also showed that the students scored high marks in their URPII final oral presentation assessment even though most of them were reported to experience high and moderately high anxiety in the presentations. Six student focus group interviews and individual interviews with the panel of evaluators were also conducted. Findings revealed both similar and different perceptions of factors that affected students' TOP anxiety. Both groups perceived limited technical knowledge, panel of evaluators and barriers in students' English language to be major sources that impacted students' anxiety. However, factors such as lack of presentation skills and inadequate preparations were the two factors emphasized by the evaluators but not pointed out by the students. The students, on the other hand, perceived unhelpful supervisors, time constraints and having negative attitudes towards technical oral presentations as factors that affected their feelings of anxiety. This study extends previous research by including the findings from the students' actual experience in delivering individual technical oral presentations (TOP) in the field of English for Specific Purposes (ESP). Furthermore, an in-depth investigation on the sources of anxiety also contributes to understanding the anxiety experienced through the perspectives of both students and the evaluators.

CHAPTER ONE

INTRODUCTION

1.0 Background of Study

The issue of employability has been frequently discussed and debated by employers and higher education institutions (Baldwin, 2011). Today, the graduate employment market is facing rapid changes due to globalization, competition and intensification of knowledge-based economies (Wilton, 2011; Harvey, Lockey & Morey, 2002). There is growing awareness of the importance of higher education moving towards preparing graduates with important competencies and skills to enhance employability. Ju, Zhang and Pacha (2011) define employability skills as "general and nontechnical competencies required for performing all jobs regardless of types and levels of jobs" (p. 2). One has a higher chance to be employed, to be an asset to the employer and to be successful in the workplace if he/ she possesses appropriate soft skills, abilities (a set of achievements) and good personal characteristics (Baldwin, 2011; Barrow, Behr, Deacy, Mchardy &Tempest, 2010).

In the United Kingdom (UK) for instance, due to employers' demand for particular employability skills among graduates, higher education institutions are required to explicitly embed employability skills, professional development courses and lifelong learning modules in the degree curriculum to enhance employability skills among their graduates and hence increase employability (Wilton, 2011; Barrow et al., 2010). Among the main employability skills sought after by UK employers are communication skills, enhanced Information Technology (IT) skills and relevant work experiences (Wilton, 2011).

Similar to UK employers, it was reported that leading Australian employer associations have also started placing less emphasis on training new employees (Sheldon & Thornthwaite, 2005). They expect the vocational education and training (VET) system to be responsible to produce future vocational employees with higher levels of key skills and an extensive set of employability skills namely soft-skills (i.e. communication skills, problem solving skills and team working skills) and higher levels of personal qualities (i.e. values, attitudes and personality characteristics). Furthermore, other training providers are also urged to include employability skills in their formal assessments in the curriculum and students be given certificates for their achievement.

In Malaysia, the issue of human resources has also been appropriately highlighted and identified at the national level to be one of the critical factors that contribute to the nation's economic development. Realizing the important role of higher education institutions, the Ministry of Higher Education (MoHE) laid out the National Higher Education Strategic Plan in 2007, emphasizing the importance of producing knowledgeable, skilful and superior personality human capital in order to face development challenges as the country moves towards a knowledge-based economy (Ministry of Higher Education, 2007). However, the Malaysian Prime Minister, Datuk Seri Najib Tun Razak said that, as reported in the 10th Malaysia Plan Report in 2010 by the Economic Planning Unit of the Prime Minister's Department Malaysia (2010), unemployment among graduates from local universities who graduated in 2009 was as high as 27% six months after graduation. The problem may be attributed to the fact that many local university graduates lack skills and competencies required by employers as reported in the Malaysia New Economic Model report (National Economic Advisory Council, 2009).

Various research studies on Malaysian employers' expectations of Malaysian graduates have been conducted and findings show that oral communication skills are highly valued and sought after by Malaysian employers (Yuzainee Md Yusoff, Azami Zaharim & Mohd Zaidi Omar, 2011; Suzana Ab. Rahim & Farina Tazijan, 2011; Ayiesah Ramli, Roslizawati Nawawi & Chun, 2010; Mohd Yusof Husain, Seri Bunian Mokhtar, Abdul Aziz Ahmad & Ramlee Mustapha, 2010; Rajan, 2010; Azami Zaharim, Yuzainee Md Yusoff, Mohd Zaidi Omar, Azah Mohamed & Norhamidi Muhamad, 2009).

A very recent study on engineering employability skills in Malaysia was conducted by Yuzainee Md Yusoff, Azami Zaharim, and Mohd Zaidi Omar (2011). The study aimed to obtain feedback from employers in the engineering sectors on the most required attributes from the newly proposed Malaysian Engineering Employability Skills (MEES) framework. The analysis of 300 questionnaires showed that the most required skills by employers in hiring new entry-level engineers in their workforce were communication skills, followed by team working skills. On communication skills, it was reported that specific abilities such as the ability to speak using clear sentences, present ideas confidently and effectively and listen and ask questions were ranked highly. It signifies the importance of engineering graduates to possess high level of oral communication competence as oral communication skills are highly valued by engineering employers. Mohd Yusof Husain et al. (2010) who also conducted a study with employers in engineering industries found that employers perceived several employability skills as must-have skills among engineering graduates. The top three skills emphasized were personal quality, interpersonal skills and resources skills. Even though the employers did not specifically highlight the significance of oral communication skills, it is important to

note that the ability of one person to interact with others (i.e. interpersonal skills) appropriately and effectively requires effective communication competence. Spitzberg and Cupach (1984) asserted that communication competence is "the yardstick for measuring the quality of our interpersonal relationships" (p.11). In another study, Rajan (2010) distributed a questionnaire to 129 mechanical engineering employers in Negeri Sembilan and found that employers highly valued fundamental skills such as technical knowledge and the ability to apply the knowledge in practice, followed by people related skills. In relation to people related skills, it was reported that these employers demand their employees and employees-to-be to have good communication skills and be able to work effectively in a team.

In a similar study, Ayiesah Ramli, Roslizawati Nawawi and Poh (2010) revealed that the most important employability skills demanded by employers from physiotherapy graduates were the ability of graduates to demonstrate critical thinking skills, to apply theory into practice followed by the ability to display sharp analytical skills. Besides that, the employers also emphasized the importance of oral communication skills especially in giving clear explanations about the problem that patients were suffering from and how the problem would be treated.

In another study, Suzana Ab. Rahim and Farina Tazijan (2011) investigated the verbal or oral communication skills that hotel practitioners demanded of their front office personnel in order to work effectively in the hospitality industry. Findings show that these personnel are highly engaged in verbal communication primarily with customers or hotel guests, managers and co-workers. Being upfront personnel, their job requirements necessitate them to attend to customers' enquiries on daily basis, such as providing appropriate information through telephone or in person. In addition, their job descriptions also involve giving an oral report to hotel

managers and coordinating with other departments in the hotel. Therefore, it clearly shows that being highly competent in oral communication (particularly for front office personnel) is essential in hospitality industry for effective operational management.

A research study by Koo, Pang and Fadhil Mansur (2008) used the framework of pluriliteracy in gathering employers' feedback on literacies demanded of graduates. Data from a questionnaire distributed to 76 employers revealed that positive attitude and mindset were ranked first, followed by competency in the specialization area, competency in communication, vocational competency and competency in language communication. With regard to linguistics competence, employers clearly stated that it was of utmost importance in their organizations and majority of the employers were not ready to retrain new employees in English language literacy. In other words, they expected higher education institutions to train their students in both oral and written English communication as part of employability enhancement programmes.

Apart from research studies on the employability skills demanded by employers, many other studies have been conducted on the gaps between the Malaysian employers' expectations and graduates' competencies. Some of the most recent of these were carried out by Ken and Cheah (2012), Arawati Agus, Abd Hair Awang, Ishak Yussof and Zafir Khan Mohamed Makhbul (2011) and Rahmah Ismail, Ishak Yusoff and Lai (2011). Most recently, Ken and Cheah (2012) investigated the gaps between employers' expectations for business graduates (in the banking sector) and the business graduates' actual work performance. Business employers have high expectations that graduates are highly resourceful, highly competent in oral communication skills, possess good team-working and computer

skills and are adept at problem solving. Results show, however, that the graduates' actual performances were found to be below the employers' expectations.

In another recent study, Arawati Agus, Abd Hair Awang, Ishak Yussof and Zafir Khan Mohamed Makhbul (2011) explored the gap between graduates' work skills and industry's expectations of employability skills, as perceived by human resource managers in various industries around Malaysia. It was reported that a discrepancy was found between expectations and actual abilities in the following three important areas: "communication and interpersonal skills", "decision making and problem solving skills" and "thinking skills". With regard to communication and interpersonal skills, Malaysian employers were not satisfied with graduates' persuasive skills and their ability in explaining and projecting their ideas and opinions clearly. The employers also highlighted that the graduates were found to possess low self-confidence in conveying information and they also faced difficulties in giving proper and clear instructions. In short, the employees' command in oral and written communication did not meet the employers' expectations.

Rahmah Ismail, Ishak Yusoff and Lai (2011) who carried out a study with the services sectors of the Malaysian public sector, local private sector and multinational organizations discovered that Malaysian employers look forward to recruit holistic graduates who are not only knowledgeable in their field of studies, but also possess soft skills such as good interpersonal and communication skills, proficient in both Malay and English languages as well as creative in decision making and problem solving. Even though Malaysian employers rated graduates' work performance as quite satisfying, the local graduates were still found to be deficient in English communication skills and knowledge in their field of studies.

From the literature, it is evident that effective oral communication skills are highly demanded by employers in Malaysia, including engineering employers. Therefore, one of the challenges for higher education institutions in Malaysia is to produce high quality graduates who are highly competent in oral communication skills. The present study seeks to investigate the oral communication skills among tertiary students, particularly in delivering technical oral presentations in the context of engineering education.

1.1 Oral Communication in English

The ability to speak fluently and competently in a target language has been regarded as important for English as second language (ESL hereafter) learners in achieving success in both their academic as well as their professional lives. Research on oral communication in ESL speaking classrooms has been extensive. Many research studies on oral communication in ESL classrooms focus on public speaking in basic communication courses. These studies explore public speaking teaching techniques (Yu-Chih, 2008), examine ways to cope with speech anxiety (Finn, Sawyer & Schrodt, 2009; Kostić-Bobanović & Bobanović, 2007; Woodrow, 2006; Elliot & Chong, 2004) and investigate factors that contribute to speech anxiety (Elliot and Chong, 2004; Cebreros, 2003; Horwitz, Horwitz & Cope, 1986). Some research studies also centred on oral presentation skills but most focused on analysing the oral presentation skills that were needed to be mastered by ESL speakers to meet workplace demands (Kim, 2006; Palmer & Slavin, 2003; Crosling & Ward, 2002; Leong, 2001). More recently, research has shifted to the investigation of oral performance of ESL speakers in formal settings such as academic and seminar presentations (Chou, 2011; Morton, 2009). However, not many researchers have conducted thorough investigations on English for Specific Purposes (ESP

hereafter) oral presentations in English among engineering students in relation to affective factors.

1.2 Speaking Skills in the ESL classroom

Speaking in a second language (L2) involves "the development of a particular type of communication skill" (Bygate, 2001, p. 14). The oral communication skill is defined as "communicating orally in a manner which is clear, fluent and to the point, and which holds the audience attention, both in groups and one-to-one situations" (Hairuzila Idrus & Rohani Salleh, 2008, p. 62). Crosling and Ward (2002) view oral communication as an essential and influential skill in the workplace as it is in daily life. They further claim that "the success of oral communication depends on the parties sharing background knowledge and assumptions and miscommunication can result if there is a mismatch" (p.45).

Speaking is probably the most difficult skill to master because the speaker must be able to manage his/ her speech fluency and accuracy simultaneously. Furthermore, speaking skills are also affected by context which makes it somewhat more "unpredictable" (Bygate, 2001, p. 16) than written interaction. In the ESL classroom, learners are exposed to various speaking tasks to practise both macro-skills, such as turn-taking and micro-skills, for instance pronunciation and vocabulary. These classroom tasks are based on various teaching approaches and theories that constitute characteristics of speech and oral discourse. Therefore, ESL students would be exposed to many speaking activities which involve group and individual oral performance such as group and individual oral presentations. In some situations, more advanced ESL learners are encouraged to take Advanced Oral English courses such as Public Speaking courses. In these courses, students would be

exposed to different types of public speaking genres such as informative, persuasive and argumentative speeches.

Oral presentation, which is a subset of the public speaking genre (Storts, 2008) is normally taught to ESL students at tertiary level. Levin and Topping (2006) define oral presentation as "a talk or speech given by a presenter (sometimes more than one) to an audience or two or more people" (p.4). Irvine (2009) then, extended Levin and Topping's oral presentation definition by specifying the characteristic of the oral presentation that it is "a planned and rehearsed talk or speech that is not committed to memory or read directly from script" (p.11). Based on the two definitions of oral presentation, it is important to note that in delivering an oral presentation, one has the opportunities to plan and practice the talk before presenting it to a set of audience. Woodrow and Chapman (2002) suggested that delivering oral presentations is an integral skill for English for Academic Purposes (EAP) students to master. Research also found that oral presentations reflect "intellectual values and academic skills" (Morita, 2000, p. 287).

Learners must employ certain strategies such as rhetorical strategy (such as narrative style), generic structure and linguistic forms to deliver successful academic oral presentations or discipline-specific oral presentations which are normally seen as part of an assessment (Swales et al., 2001). Formal oral presentations are among marketable skills which are important for both educational and professional success (Al-Issa & Al-Qubtan, 2010; Kim, 2006).

1.3 Teaching Speaking Skills for Specific Purposes

Many research studies have been conducted to analyse industries' needs of oral communication competency among graduates from professional fields such as

engineering, ICT, business architecture, accounting and economics (Kassim & Ali, 2010; Kerby & Romine, 2009; Kaur & Lee, 2003; Crosling & Ward, 2002; Sageev & Romanowski, 2001; Leong, 2001). While research states that possessing effective oral communication skills empower graduates to be recruited in that they would be able to complete work-related tasks competently and effectively, it also enhances the opportunities for better job promotion (Kassim & Ali, 2010; Crosling & Ward, 2002). However, there is a mismatch between graduates' oral communicative abilities and the industry's high demand and expectations from the graduates (Rosli Talif & Rohimmi Noor, 2009; Venkatraman & Prema, 2007, Tengku Sri Mahaleel Tengku Ariff, 2002). This calls for more research studies on language use in specific disciplines to provide students with specific oral communication skills relevant to the needs of the students and the workplace.

The fact that English is the preferred language for communication in many workplaces such as in Malaysia (Phang, 2006; Ting, 2002), it boosts massive development in ESP research studies. Dudley-Evans and St John (1998, p. 3) posited that "ESP is designed to meet specified needs of the learner, related in content to particular disciplines and centred on language appropriate to those activities in syntax, lexis, discourse, semantics and so on, and analysis of the discourse". Further, Rosli Talif and Rohimmi Noor (2009, p. 67) are of the opinion that ESP involves "the notion of discourse community which implies specific use of language in specific contexts". Many ESP research studies on communicative events which are frequently conducted in industries focus on language use which is genre-specific. This is in line with preparing students for the workplace. In ESP speaking instructions, ESP practitioners may choose activities from a broad range of speaking tasks. To practice the target language, students can participate in large and small

group discussions, get involved in debates and cooperate in completing class projects.

To have a successful communicative event, both speaking and listening skills are needed. For various purposes, spoken interactions which comprise more than one party essentially require active listening and effective questioning skills. Unlike written work which is written or printed on papers, spoken interactions' tangibility can be gained through recordings, either audio or video recording. Dudley-Evans and St John (1998) believe that the use of positive feedback (based on recording) may enhance learning and thus raise learners' confidence level. They further posited that confidence is a significant factor for many language learners in terms of speaking and they state that classroom feedback should be appropriately given to maintain and increase confidence of the learners. Reformulation (which is similar to the process of drafting in writing stages), is also seen to be effective for spoken language. Dudley-Evans and St John (1998) suggest that at the reformulation stage, learners are given a chance to speak, obtain feedback with reformulation and then re-draft by repeating the interaction.

Oral presentation or speaking monologue is a feature of English for Occupational Purposes (which is a division of ESP) found in courses for professionals such as engineers and doctors (Dudley-Evans & St John, 1998). This establishes the fact that oral presentation is one of the highly engaged communicative events in both industries and hospitals. The teaching of oral presentation skills generally focuses on structuring, visuals, voice and advance signaling and language. Structuring a presentation is important so as to show the flow of the presentations, the start, the middle and the end. This helps listeners to follow the presentations well. Visuals are another key feature that should be taught in oral presentation skills. One

of the major differences in general and technical oral presentations as suggested by DiSanza and Legge (2009) is the use of visuals in presentations. In the engineering field for instance, appropriate visuals such as figures and charts are mandatory to assist explanation of a complicated process in an oral presentation. The old saying "A picture is worth a thousand words" illustrates the magic and wonders that visuals can add to presentations.

Other important elements are voice works such as pronunciation and intonation are also important elements and they should be given emphasis in the teaching of oral presentations. Speakers must be highly sensitive of how words are correctly pronounced because mispronouncing certain words may affect meaning and thus hinder listeners' comprehension and intelligibility. Furthermore, having good pronunciation increases speaker's language production and fluency (Harmer, 2007). Pausing and silence also, have their own specific roles and they impact on the audience' attention and level of comprehension. Another important feature is advanced signaling or signposts, which function as indicators for specific argument or information in the presentation. Feedback is also integral in the teaching of oral presentations as it provides a means to give suggestions, ask for clarification and to agree or disagree with the language, content and structure of the presentations. Oral presentation activities in a classroom are believed to give students opportunities "to practice meaningful oral English" (Al-Issa & Al-Qubtan, 2010, p. 229).

Therefore, the present study aims to investigate the challenges that engineering students face in delivering technical oral presentations in English in their engineering classrooms.

1.4 Oral Communication Skills in Engineering Education

Oral communication is one of the key competencies identified and emphasized by educators and practitioners as being important in engineering education (Kaewpet & Sukamolson, 2011; Requena-Carrión & Alonso-Atienza, 2010). It is clearly stated by international engineering accreditation bodies such as in the Accreditation Board of Engineering and Technology's (ABET) requirements that engineering graduates must be competent in soft skills such as communication skills besides other hard skills. In fact, ABET instructs engineering faculties to offer effective instructions in both oral and written communication skills (Felder et al., 2000). Similarly, effective communication capability, such as giving clear oral instructions and making effective oral and written presentations are also emphasized as one of the core competencies to be mastered by all Malaysian engineering graduates (Engineering Accreditation Council, 2007).

Such a requirement was made based on nature of engineers work in industry. Sageev and Romanowski (2001) found that "an astonishing" 64% of engineers' overall work time is spent on some form of communication: 32% on writing, 22% on oral discussions and 10% on oral presentations. Even though the time spent on oral presentation in the workplace is small, many respondents cannot deny the fact that oral presentation is important in technical communication curriculum. One engineer in their study emphasized that "...a strong presentation can 'sell' conceptual products to upper management" and another of his colleagues stressed that "a bad presenter is career-limited" (p. 688). Tenopir and King (2004) reported that the amount of time engineers spent communicating information outputs in terms of technical information or general ideas at work orally is more than in written form. Increasingly, engineers are required to communicate as managers in order to work with other departments to

develop products, collaborate with individuals in other countries in multinational firms, explain design changes to nontechnical hourly workers and convince sponsors and clients of the importance of their research. Generally, the oral communication forms that take place in the engineering workplace ranges from providing consultations to delivering oral presentations.

Dannels (2001, p. 148) views oral communication as "a competency that is closely connected with disciplinary content, identity and epistemology". Oral presentations which are part of oral communication skills have also been part of formal and informal activities and assessments in engineering classrooms in tertiary settings (Dannels, 2002). However, oral communication instruction has often been disintegrated from actual learning of disciplinary content (Dannels, 2001). As a result, many students face difficulty in presenting their engineering content orally. In many situations, engineering students in universities take public speaking classes organized by Language or Communication Departments to improve their oral communication skills. The skills emphasized and taught in these courses could be different from essential features and competencies needed in the engineering discipline.

Dannels (2002) found out that translation is the key speaking competency in the engineering context. To have effective presentations with engineering-based audience, engineering students must be able to translate their disciplinary content knowledge into visuals and numerical forms. Meanwhile, if the audience comprises laypeople, simple and persuasive presentations must be delivered. Such issues highlight the importance of collaboration between the engineering faculty and the language and communication department to develop these specific competencies among engineering students (Kedrowicz, Watanabe, Hall & Furse, 2006). With

prompt and specific feedback on strengths and weaknesses provided to the language and communication department, necessary improvements and revisions on the content of oral communication courses can be carried out.

1.5 Anxiety in Oral Presentations

Public speaking or oral presentations are found to be one of the most anxiety provoking situations for many students, including engineering students (Kovač & Sirković, 2012; Al-Issa & Al-Qubtan, 2010; Bankowski, 2010; Tong, 2009; Rojo-Laurilla, 2007; Kavaliauskienė, 2006; Woodrow, 2006; King, 2002). There are two types of anxiety: facilitating anxiety and debilitating anxiety. While facilitating anxiety helps students increase their efforts (MacIntyre, 2002) to develop strategies to reduce anxiety through thorough preparation (in the context of delivering oral presentations), debilitating anxiety (the more common interpretation of anxiety) produces negative effects which are detrimental to one's oral performance ability (MacIntyre & Gardner, 1989). Through proper identification of students' problems in becoming effective speakers such as levels of anxiety and factors that lead to anxiety, findings may help both the engineering faculty and the language and communication department to improve the syllabus of oral communication courses. Indeed, such awareness in assessing problems such as anxiety among students and development efforts from both within and across academic disciplines and departments may enhance cooperation and result in effective instructions and thus produce more competitive engineers for today's global job market.

Therefore, this study seeks to investigate technical oral presentation anxiety in English in the context of engineering education at the tertiary level. This study will further extend the body of knowledge on technical oral presentations by employing

both quantitative and qualitative methods in exploring the affective factors of anxiety that appear to affect chemical engineering students' performances in carrying out technical oral presentations in English. This study also considers the perspectives of various stakeholders in better understanding the issue.

1.6 Profile of Universiti Malaysia Pahang

Universiti Malaysia Pahang (UMP hereafter), where the study was conducted is situated in Gambang, Kuantan, Pahang on the East Coast of Peninsular Malaysia. UMP is currently operating in the following two main campuses: Gambang Campus situated in Kuantan and Pekan Campus situated in Pekan, Pahang. The emphasis on engineering and technology is represented by the university's motto "*Engineering, Technology and Creativity*" and manifested through the university's curriculum. Being a technical university, the niche areas of the university are:

- chemical engineering and industrial biotechnology
- automotive engineering and manufacturing

Established in 2002 as University College of Engineering and Technology Malaysia (KUKTEM), it was later renamed Universiti Malaysia Pahang in 2007. UMP offers a variety of engineering and technology related diploma, undergraduate and postgraduate courses namely in the areas of Chemical Engineering and Natural Resources, Mechanical Engineering, Electronic and Electrical Engineering, Civil Engineering and Earth Resources, Computer Science and Software Engineering, Technology Management and Science Industry. On UMP's establishment in 2002, it started with five engineering faculties and four academic centres. To date, in 2012, as a rapid developing university, UMP has a total of eight faculties which offer various engineering and technology related courses, eleven academic and non-

academic centres which provide services and training to all UMP staff and students and three centres of excellence that conduct advanced research in specific engineering field. Presently, the university has more than 7000 students enrolled in various courses and in different modes. Table 1.1 below explicates the faculties and centres in UMP:

Table 1.1: List of Faculties and Centres in Universiti Malaysia Pahang

FACULTIES	CENTRES	EXCELLENCE CENTRES
Faculty of Chemical and Natural Resources Engineering	Centre for Modern Languages and Human Sciences	Centre for Earth Resources Research and Management
Faculty of Mechanical Engineering	Centre for Continuing Education and Professional Development	Automotive Engineering Centre
Faculty of Civil Engineering and Earth Resources	Centre for Academic Innovation and Competitiveness	Centre of Excellence for Advanced Research in Fluid Flow
Faculty of Electrical and Electronic Engineering	Academic Management Division	
Faculty of Computer Science and Software Engineering	Institute of Postgraduate Studies	
Faculty of Sciences and Industrial Technology	Islamic and Human Development Centre	
Faculty of Manufacturing Engineering	Corporate Development and Quality Management Centre	
Faculty of Technology	ICT Centre	
	Sports Centre	
	Entrepreneur Centre	
	Medical Centre	

As the first public technical university in the east coast of Malaysia, UMP has been receiving many study applications from school leavers, diploma holders and

degree holders especially from the east coast states of Kelantan, Terengganu and Pahang as well as from other states in Peninsular Malaysia.

1.6.1 The Centre for Modern Languages and Human Sciences (CMLHS)

The CMLHS has been given the responsibility to develop students' English proficiency. The English for Specific Purposes ESP courses offered by CMLHS are specifically designed to cater to the English language needs of engineering students to function adequately in their academic studies and their future field of work in engineering industries. Table 1.2 below illustrates the structure of ESP courses offered by CMLHS:

Table1.2: Structure of ESP courses in CMLHS

Diploma	Bachelor Degree
Level One:	Level One: Technical English
English for General Communication	Level Two: Technical Writing
Level Two:	Level Three: Academic Report Writing
English for Technical Communication	Elective courses:
Level Three:	Introduction to Public Speaking
English for Workplace Communication	Effective Reading
	Expository Writing
	Project-based Proposal Writing

1.6.2 The Faculty of Chemical and Natural Resources Engineering (Context of the study)

The Faculty of Chemical and Natural Resources Engineering (FCNRE hereafter) is among the first faculties to be established in UMP in 2002. The faculty offers courses ranging from Diploma to PhD level. The duration for Diploma and Bachelor programmes is three and four years respectively. Three Bachelor programmes are offered, namely Bachelor in Chemical Engineering, Bachelor in

Chemical Engineering (Gas Technology) and Bachelor in Chemical Engineering (Biotechnology). At present, there are more than 1500 students enrolled in all the programmes offered.

1.6.3 The Undergraduate Research Project (URP)

The Undergraduate Research Project (URP) is a compulsory course for all final year undergraduate engineering students to register, complete and pass in order for them to graduate. In this course, the students are required to carry out and complete laboratory work or an experimental project under the supervision of a faculty member.

The URP course has two levels to be taken in two semesters. The first level (URPI), which is usually offered in the sixth semester of the Bachelor programme requires the students to write and present a proposal on the project and complete Chapter One (Introduction), Chapter Two (Review of related literature) and Chapter Three (Methodology) of their written report. In the second level (URPII), the students are required to complete and submit their written report and present their research findings before expert-field evaluators in Week14 of the seventh semester. To aid the presentation, Power Point slides which contain all relevant and important data of the project need to be prepared. Each student is given twenty minutes to present their significant findings and another ten minutes for a question and answer session. During the URPI and URPII oral presentations, expert-field evaluators are appointed to assess the presentation which carries 20 % of the total URP marks. Similar to the weightage given to proposal presentations in URPI, the final oral presentation assessment in URPII also carries 20% of the total URPII marks (please refer to Table 3.3 for the breakdown of marks for URPI and URPII). The high

weightage given to the presentation indicates the importance of oral presentations in engineering education specifically and in the engineering field as a whole.

Previous studies have reported the benefits of carefully crafted URP or capstone course for engineering students (Malinowski & Noble, 2009; Mohd. Sam, Abu Bakar & Kassim, 2004). This course provides students with work experience while still in an academic setting. It undoubtedly promotes independent learning among the students because students need to conduct and complete the project individually. In addition, the URP course also inculcates soft skills elements such as the practice of good communication skills among students and the application of effective presentation skills in their oral presentations.

1.7 Statement of the Problem

Possessing effective communication skills has been proven to be of advantage for individuals in both academic and professional settings (Chan, 2011; Barrow et al., 2010; Emanuel, 2005; Campbell et al., 2001). In the engineering field for example, all engineering graduates are expected to be highly competent in written and spoken communications. Criteria for being effective communicators have been highlighted in the engineering education curriculum learning outcomes listed by engineering accreditation bodies such as the Washington Accord, the Accreditation Board of Engineering and Technology (ABET) (2010) and the Malaysian Engineering Accreditation Council (Board of Engineers Malaysia, 2007). This corresponds with engineering professional work demands whereby most of their time is spent on written and oral communication (Kassim & Ali, 2009; Tenopir & King, 2004; Dannels, 2003; Dannels et al., 2003; Zolkepli Buang et al., 2003; Sageev & Romanowski, 2001). For instance, in their everyday tasks, practising engineers are

required to communicate ideas and concepts to a group of people through formal and informal oral presentations (Tenopir & King, 2004; Darling & Dannels, 2003; Crosling & Ward, 2002).

In engineering education, oral presentations form an integral part of assessment and evaluation practices and will continue to be an essential part of oral communication at the workplace for engineers. As the expert of communication across the curriculum (CXC), Dannels (2002) states that "the teaching and learning of oral presentations were completely connected to the norms, values and ideologies of the engineering discipline" (p. 265). Furthermore, industry expectations dictate that oral presentations become part of engineering curriculum to produce high-skilled professional engineers who are also effective presenters. Such expectations mark the importance of developing students' level of self confidence in various communication settings, especially in oral presentation contexts.

Nevertheless, Malaysian learners of English in the engineering field were observed to have difficulties and show signs of anxiety when delivering technical oral presentations. Preliminary interviews (regarding engineering students' technical oral presentations) were conducted in September 2009 with three engineering lecturers in Universiti Malaysia Pahang (UMP) in Kuantan, Pahang. During the interviews, one of the lecturers highlighted that majority of the students "showed high levels of anxiety during presentations". High anxiety levels experienced by these students caused them to "read from slides" and some students manifested some speech anxiety attributes such as nervous gestures during oral presentations. The lecturers also asserted that "some of the students have problems speaking in English; therefore they have problems in conveying ideas effectively". The lecturers cited the following factors as being contributory towards their students' levels of anxieties in

delivering oral presentations: a limited range of English vocabulary, inadequate knowledge of their presentation topic, lack of confidence to speak in English and an inadequate rapport with the audience.

The decline of English language standards among Malaysian students has attracted many researchers to embark on this area of second language learning. One area which has become the concern of many researchers is anxiety in learning English, particularly with regards to anxiety in speaking English among Malaysian tertiary students (Prima Vitasari et. al, 2010; Shafiq Hizwari et. al, 2008; Rachel Tan, 2008; Noor Hashima Abdul Aziz & Arshad Abdul Samad, 2005). According to these research studies, feelings of anxiety experienced by Malaysian students in learning English language were found to have an effect on students' academic achievement and performance. Although the research studies have provided evidence of anxiety in ESL learning situations and speaking English, studies conducted were limited to English language classroom settings and general public speaking events. However, these studies have not been able to explain the experience of anxiety in learning engineering subjects such as chemical engineering subjects in English and particularly anxiety in delivering technical oral presentations in English. According to Dannels et al. (2003), a study on learning challenges faced by engineering students in this "important yet difficult issue involved in learning to communicate in spoken form, with a group or to an audience in engineering context" (p. 56) should receive due attention. Furthermore, Bodie (2010), Tong (2009) and Ercan et al. (2008) also suggested the need to conduct further investigation on causes of anxiety and students' attitude towards ESP oral presentations.

According to Mariana Yusoff (2008, 2010), research related to technical oral presentations in English by Malaysian learners within the engineering discipline is

scarce. She conducted a study on students' communication competence in relation to oral presentations delivered during their Industrial Training Programme. Even though the students faced difficulties in conveying information to audience due to their low English proficiency, their high motivation enhanced their self-esteem and helped to improve their presentation performance. While Mariana Yusoff investigated communication competence relating to oral presentation, Battacharyya and Sargunan (2009) and Battacharyya (2011) focused on the evaluation and assessment aspect of it. They gathered stakeholders' perceptions of effective communication skills and presenter attributes requirements for technical oral presentations. Their study found that the three attributes that enhance the effectiveness and delivery of a presentation are high self-confidence, methodology competence and visual presentation.

Considering the gap in research on technical oral presentations in Malaysia, a study related to affective challenges and physiological states of engineering students in facing technical oral presentations must be addressed in depth. This study intends to be more comprehensive in nature as it considers the perceptions of three different stakeholders: the experiences of the engineering students in delivering the technical oral presentations, engineering course lecturers and industry personnel. Hence, this study is an attempt to bridge the gap in the literature on technical oral presentations. The results of this study may provide useful insights for engineering students, engineering and language educators and curriculum designers.

1.8 Objectives of the Study

This research aims to achieve the following objectives:

1. To examine the extent to which UMP engineering students experience technical oral presentation anxiety in English.
2. To determine oral communication apprehension levels in English among UMP engineering students.
3. To investigate the relationship between students' technical oral presentation anxiety levels and their technical oral presentation grade.
4. To analyze the factors that contribute to students' apprehension in delivering technical oral presentations in English.
5. To examine the perceptions of the panel of evaluators about students' technical oral presentation anxiety in English.

1.9 Research Questions

The research aims at answering the following questions:

1. To what extent do UMP engineering students experience technical oral presentation anxiety in English?
2. What are the oral communication apprehension levels in English among UMP engineering students?
3. What is the relationship between students' technical oral presentation anxiety levels and their technical oral presentation grade?
4. What are the factors that contribute to students' apprehension in delivering technical oral presentations in English?
5. What are the perceptions of the panel of evaluators about students' technical oral presentation anxiety in English?

1.10 Scope of Study

This research study involved three groups of respondents. Firstly, it involved a group of final year engineering students, the 2007/ 2008 cohort from the Faculty of Chemical and Natural Resources Engineering (FCNRE), Universiti Malaysia Pahang (UMP). The second group involved the engineering lecturers from the Faculty of Chemical and Natural Resources Engineering (FCNRE), Universiti Malaysia Pahang who have more than 7 years of experience teaching in UMP. They were also experienced in teaching URPI and URPII courses and in supervising students in URPI and URPII projects. The third group comprised the chemical engineering personnel who were appointed as the panel of evaluators in URPII final oral presentations, on 25 November 2010 (Semester 2, Session 2010/2011).

It has to be pointed out that this study is not a needs analysis study among ESP students. Rather, it focuses only on the experience of anxiety encountered by the final year chemical engineering students when they carry out technical oral presentations (TOP) in English. Analysis on the factors that contribute to the students' TOP anxiety was conducted based on students' experiences in delivering TOP and the evaluators' perceptions of the students' TOP anxiety. This study also focuses on students' level of technical oral presentation (TOP) anxiety and oral communication apprehension (OCA) in English as well as the relationship between TOP levels of anxiety and students' achievement in their oral presentation assessment. Therefore, its scope is the students' experience of anxiety in technical oral presentations in English in the context of chemical engineering education.

Even though the present study investigated TOP in English, it does not examine the English language proficiency of the students. This study only sought to

analyze the factors that contributed to students' technical oral presentation (TOP) anxiety.

1.11 Significance of the Study

First and foremost, this study aims to make a contribution to the field of oral communication in English as a Second Language (ESL). It aims to provide insights especially for ESL and engineering educators who are involved in the implementation of oral presentations in English as a means of assessment in the classroom. This study focuses on the use of technical oral presentations (TOP) in English in the context of engineering education at tertiary level.

This study also intends to enhance awareness of the importance of oral presentations in English in the field of engineering. More specifically, this study highlights the experience of chemical engineering students in delivering URPII final oral presentations in English in engineering classrooms. As future engineers, students must be exposed to effective oral communication in English particularly in delivering effective oral presentations. This is due to the fact that in the practising engineers' everyday tasks, they are required to communicate ideas and concepts to a group of people through formal and informal oral presentations (Kassim & Ali, 2009; Tenopir & King, 2004; Darling & Dannels, 2003; Crosling & Ward, 2002; Sageev & Romanowski, 2001). Furthermore, as Malaysian employers expect graduate engineers to be communicatively competent in English language so that they can present ideas and opinions effectively in the workplace (Yuzainee Md Yusoff, Azami Zaharim & Mohd Zaidi Omar, 2011), future engineers must be equipped with effective oral communication skills particularly in delivering effective oral presentations in English as English is the lingua franca of business.

This study also looks into the factors that contributed to ESL students' anxiety in delivering technical oral presentations in English. These findings help to improve ESL and engineering educators' understanding about how to facilitate students to decrease their levels of anxiety and increase their self-confidence in using English, particularly in academic oral presentations.

This study also has significant implications on curriculum development and syllabus design in the context of second language learning especially in designing more targeted, efficient and beneficial learning outcomes. Aligning curriculum and syllabus towards fulfilling deficit competencies among undergraduates in oral communication skills (particularly oral presentation skills) are indeed necessary. This is because higher education institutions play a significant role in producing quality graduates with good oral communication skills. As such, it is imperative for oral communication skills to be incorporated into the course learning outcomes so that adequate opportunities and space for oral communication practice, particularly oral presentation activities can be included as specific course contents or embedded into certain related technical and non-technical courses within the broader engineering curriculum.

1.12 Limitations of the Study

There are a number of limitations that arose from this study. The first limitation is the small sample size which makes generalization to the broader community not viable. This study is limited to Universiti Malaysia Pahang final year Chemical engineering students from the 2007/2008 cohort. Therefore, generalizations to other engineering students in other public universities in Malaysia need to be carefully considered. Nevertheless, the results obtained from the selected

sample from this study can provide useful insights on students' competence in oral communication, students' performance in technical oral presentations (TOP) and the significance of oral communication specifically TOP in engineering education, as there is scant research in this area in Malaysia.

Second, the data for this study which were obtained from the questionnaires and interviews conducted was limited to interviewees' honesty in completing the questionnaires and providing their responses during the interview sessions. The researcher cannot vouch for the respondents' honesty in answering the questions posed. They might have given untruthful answers or provided responses that were socially acceptable, rather than projecting their personal and honest opinions.

Third, the data from the email interviews were limited in the sense that most of the answers given were short even though every effort was made to remind respondents to provide lengthy explanation of their views. It is important to note that there were 13 evaluators interviewed. Of the 13 evaluators, 5 were interviewed via email and 8 were interviewed face-to-face. According to Guest, Bunce and Johnson (2006), six interviewees in a study are sufficient for the data to be saturated. The interaction in the 8 face-to-face interviews conducted has provided a richness in the data collected (Nunan & Bailey, 2009).

1.13 Definition of Key Terms

This section discusses the operational terms used in this study to provide clarity and understanding of how these terms were used in the context of this study.

Engineering students refer to final year chemical engineering students from the 2007/2008 cohort who were currently working on their Undergraduate Research Project (URP) in Universiti Malaysia Pahang.

Panel of evaluators refer to the Undergraduate Research Project (URP) evaluators comprising 6 faculty lecturers who taught and supervised undergraduate engineering students in the Undergraduate Research Project (URP) in Universiti Malaysia Pahang (UMP) and 7 representatives from chemical-related industries around Malaysia.

Technical oral presentation refers to a prepared formal oral presentation on Undergraduate Research Project (URP) delivered in English by final-year undergraduate engineering students as part of the fulfilment of graduation requirements in Universiti Malaysia Pahang.

Technical oral presentation anxiety refers to the feeling of fear and worry to deliver an oral presentation on technical topics in English in public. The definition is based on Bodie (2010) who refers to public speaking anxiety as "a situation-specific social anxiety that arises from the real or anticipated enactment of an oral presentation" (p. 72) and MacIntyre and Thivierge (1995) who define public speaking anxiety as "the fear and uneasiness caused by the potentially threatening situation of speaking before a group of individuals" (p. 457).

Oral communication apprehension refers to "individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons" (McCroskey, 1977, p. 78). This study investigates students' oral communication apprehension in English language.

Situation-specific anxiety refers to "the probability of becoming anxious in a particular type of situation, such as during tests (labelled as test anxiety), when solving mathematics problems (maths anxiety), or when speaking a second language (language anxiety)" (MacIntyre & Gardner, 1994a, p.2). This study focuses on the anxiety experienced by students specifically in giving technical oral presentations in English.

Students' performance in technical oral presentations refers to the URPII final oral presentation scores obtained by the students during the assessment. The scores refer to the scores for final presentation section which is 25% of the whole URPII final oral presentation assessment (please refer to Table 3.4).

Anxiety/ Apprehension refers to the feeling of fear and worry experienced by engineering students in delivering their technical oral presentations in English. In this study, both terms anxiety and apprehension are used interchangeably throughout this thesis.

1.14 Organization of Chapters

This thesis is written in six chapters. The first chapter of this study gives an overview of the study. It provides background information of the study, presents the statement of the problem, objectives of the study, research questions, significance and limitations of the study as well as definition of key terms used in this study. The second chapter discusses theories underpinning this study and the relevant literature. It discusses anxiety and its relation to oral communication performance in ESL. The discussion centres on the teaching of oral presentations for specific purposes and the significance of technical oral presentations in engineering education. Chapter three explains the research methodology adopted in this study and details out the data collection instruments and data analysis methods. The fourth chapter reports salient findings from the study according to the research questions. Chapter five discusses the findings in relation to past research. Chapter six concludes by stating the pedagogical implications to the teaching field and lists out recommendations based on the findings.

CHAPTER TWO

REVIEW OF LITERATURE

2.0 Introduction

This chapter begins with a general discussion on oral communication in the field of English for Specific Purposes (ESP). This is then followed by a discussion on the issue of assessing oral communication in ESP context and in the context of engineering education. A review on anxiety as a construct and its relation to human performance is presented. Theories involved in this study are also highlighted and discussed in detail and this is followed by a discussion on related research studies conducted on oral presentation anxiety by researchers in and outside of the Malaysian context.

2.1 Importance of Oral Communication in Engineering Education

The teaching of oral communication in specific disciplines is integral in preparing students to be successful in both academic and their future endeavours (Chan, 2011). Students at the tertiary level are expected not to be only skilful in technical aspects but they also need to be skilful in communicating about the knowledge in the field. In past decades, communication across the curriculum has become the issue of interest as it plays a central role in helping students to become better speakers and alleviate other communication problems such as nervousness (Dannels, 2003). Besides emphasizing core subjects, oral communication skills have started to be recognized and explored in other disciplines such as engineering and

medical fields. This is because English is considered a lingua franca for most professional fields.

Generally, oral communication is given prominence in a wide variety of ESP courses. The main aspects of ESP course design include needs analysis, the analysis of linguistic features and genre used and the use of the methodology in the professional field (Dudley-Evans, 1997). In the teaching of ESP, the practitioners do not only teach the language skills, but they also have several other roles to be fulfilled, such as researchers and syllabus designers. Besides having English teaching competency, ESP practitioners must also have subject content knowledge. Since ESP highlights the communication ability of the students in specific settings, the language use in terms of grammar, vocabulary, register, study skills, discourse and genre itself is very important and must be researched thoroughly. All these aspects are important and must be included in both the ESP curriculum and the syllabus design. The activities created and prepared for the course emphasize the English language competencies needed and required in the workplace and mirror routine communicative events and settings that take place in the professional workplace. Among the common ESP courses are Business English, English for Legal Purposes and English for Medical Purposes. The use of authentic materials in ESP courses connects the academic and professional world in a practical way.

Aiguo (2007) described the ESP approach used in the teaching of Aviation English in the Chinese context. Aviation English is one of the ESP courses which is still new and developing in China. The syllabus prepared took into consideration the English language used among pilots, technical people, flight attendants and other personnel involved in the aviation industry. He claimed that the low English proficiency and lack of English language skills among the ESP learners prevents

them from participating effectively in the activities conducted in the classroom. To overcome the problem, bilingual education with computer-assisted instruction has been introduced and it is believed that students will benefit more from this approach. Some of the oral components in Aviation English course are on air communication such as announcements, briefing and flight deck communication. Other components such as reading, writing, listening skills and aviation linguistics are also included in the syllabus.

The core of ESP courses is based on communication ability, particularly on oral communication skills (Tsao, 2011), which is in response to the objectives listed by the academic and professional worlds. Engineering employers in Malaysia, for instance, considered oral communication skills as a must-have skill for engineers (Kassim & Ali, 2010). A research study by Dominguez and Rokowski (2002) with employees of a well-known multinational company in Spain found that 70% of the employees agreed that oral communication skills must be given due emphasis in the ESP course. In a similar study with accountancy students, Chostelidou (2010) found that learners perceived oral presentations and communicative activities related to workplace-related tasks are the most important tasks to be included and taught in the ESP course. In designing a Business English communication course for adult employees at a leading Japanese company, a needs analysis was conducted. It was found that the oral communication skills demanded by the employees are describing products, business negotiation skills, business meetings and business presentations (Cowling, 2007).

Joughin (2010) refers oral assessment to any assessment which involves speaking. Oral assessment involves primary content type (knowledge), interaction (with audience), authenticity, structure (organization), examiners (audience) and

orality (Joughin, 1998). According to Joughin and Collom (2003), oral assessment can be categorized based on several factors. It can be an independent assessment, along with other assessments in the course or a combination with other assessment such as a written paper. It can also be conducted as an individual or group assessment. The evaluators could be the presenter themselves, their peers, their course lecturers or experts from industries. In the development of oral assessments, there must be a clear connection to the learning outcomes of the course. For instance in Australia, the teaching of skills is seen as important as the teaching of content (Cooper, 2005) and oral presentation skills are also assessed. He posited that the assessment tasks must be related to learning objectives because the students' learning focuses on tasks that they will be assessed on later.

The main objective for oral assessment in professional fields is "to measure candidates' knowledge and understanding of facts, concepts, principles and procedures that underlie professional practice" (Joughin, 1998, p. 369). In assessing oral performance in professional courses such as business and medical courses, the common components evaluated are the content knowledge and the oral communication skills, that is, language fluency, both verbal and non-verbal. Both Yang (2010) and Zappa-Hollman (2007) posited that possessing a high level of English proficiency and understanding of specific discipline's systems and regulations contributes to a successful oral performance. Research studies found that some learners face problems in the ESP course because of their low English proficiency (Tsao, 2011; Aiguo, 2007).

In a research study on oral communication assessment conducted by Kerby and Romine (2009), they investigated the plan of one accounting faculty to embed an oral communication assessment, in particular, oral presentations in the accounting

curriculum. In assessing oral presentations, the faculty developed rubrics which contain the levels of oral presentation competency. There are three levels of competencies. Level 1 indicates a novice speaker and he or she needs to improve in that particular competency. Level 2 signifies a proficient speaker and Level 3 denotes an advanced speaker who possesses effective oral presentation skills. The three main oral presentation competencies that the accounting students are assessed on include: 1) appropriate use of organization patterns, 2) content that fit the audience and the assignment, 3) proper preparation, effective and professional delivery style and able to engage audience and 4) effective interactions with the audience and assessors.

Lunz and Bashook (2008) investigated the effects of oral communication ability on examiners' ratings. In the medical field, high-stakes oral certification examinations aim to test medical students' medical knowledge and practice in patient care situations. In the context of oral examinations, students who had high oral communication ability may have benefited during the examination. They may score higher but the scores might be influenced by their high oral communication ability and may not be based on their medical skills and knowledge. In this context, the authors defined oral communication ability as how they present. The results of this study however show that the examiners were not affected or influenced by the oral communication ability of the students; rather, the scores for oral certification examination were based on the students' medical skills and knowledge.

Yong and David (1996) highlighted that the test questions which are given to speakers/ examinees play a significant role in determining the level of learners' oral performance. In their evaluation on an oral-production test for an ESP course (English for Economics and Business) at the tertiary level, Yong and David found that some oral test questions that were designed and constructed in the course did not

comply with certain important criteria. In order to improve the oral test questions, they proposed that the tasks and the topic for oral test must be within the examinees' analytical/ cognitive ability and linguistic ability. The sets of topics prepared should not be too difficult for the students and should be parallel in terms of difficulty level. In addition, the language used in the questions should also be simple, succinct and straight forward so that the speaker can use more time speaking, and not in trying to understand the questions.

2.1.1 Assessing Oral Communication in Engineering Education

In answering the calls from industry to improve oral communication competence among engineering students at tertiary level, engineering education has undergone significant transformation by putting a great emphasis on oral competencies in the curriculum. In addition to the teaching of oral communication skills, oral communication assessment has also been embedded in the broad engineering curriculum (Kedrowicz, Watanabe, Hall & Furse, 2006; Dannels, 2002). Kedrowicz et al. (2006) argued that students are more exposed to the integral part of communication in engineering profession through integrated communication/ engineering courses. The intergrated communication/ engineering courses emphasize forming a partnership with other departments from other faculties which teach Technical Communication or Communication courses.

In the engineering education context, oral communication assignments such as oral presentations or design presentations will usually reflect the communicative events in industry. In essence, the presence of oral presentations as part of formal and informal assessments and activities in classroom in engineering curriculum is part and parcel of preparing students to be more competitive and successful engineers in their future workplace. The assessment task normally tests both content knowledge

and specific oral communication skills. It involves components such as language fluency, verbal and non-verbal communication skills.

2.1.1.1 The Challenges of Assessing Oral Presentations in an Engineering Course

Oral presentation has always been part of the engineering thesis examination, even though it is a minor component of the assessment (Díaz-Vázquez et al., 2012; Ku & Goh, 2010; Liow, 2008). Ku and Goh (2010) who summarized the assessment types in final year engineering research projects of 7 universities in Australia and 3 European universities, reported that all universities used oral presentation as part of the final year engineering research project (also known as a capstone project) assessment. The oral assessments come in various modes such as ordinary oral presentation, poster presentation, seminar presentation and public defence. The weighting of the oral assessment given in each university is also diverse. Some universities which place greater emphasis on oral communication competencies in the learning outcome require students to conduct a number of oral presentations and vice versa. For instance, engineering students in Victoria University, Australia must deliver oral presentations four times within the 2-semester capstone project course. The oral assessments are conducted twice in the middle and at the end of each semester (Ku & Goh, 2010). Some universities required capstone projects to be conducted in teams with several members but some universities made it compulsory for students to handle the project individually. Therefore, if it is an individual project, the oral assessment is delivered individually.

Engineering courses have provided minimal oral presentation training to the students throughout their course of study. In the University of Western Australia for instance, a lecture on presentation technique was only given one slot over the 2-

semester final project engineering course (Ku & Goh, 2010). The same situation was observed in John Cook University in Australia where the final year engineering students only received an hour of formal lecture on presentation skills early in the first semester (Liow, 2008). The situation worsens when oral presentation activities are considered as one-off activities as that may cause students to receive minimal feedback regarding their performance in the oral presentation assessment (Liow, 2008).

Oral presentation is a demanding verbal assessment which requires multiple human resources, increases the instructors' burden in keying in large amount of data and demands an extensive amount of time (Liow, 2008). Campbell et al. (2001) also identified the time factor to be one of the reasons for oral assessment to be disliked. In addition, he posited that most courses focus on written assessments, rather than oral assessments; therefore, most course lecturers had formal training in written assessment, and not in oral assessment.

Liow (2008) proposed that a more reliable and valid criteria for oral presentation assessment in engineering courses should be developed and constructed based on a better oral assessment framework. Normally, a general marking scheme with general criteria is used in assessing students' oral presentation in classroom. In engineering education, similar criteria are used in oral assessment, whether in oral presentations, seminar presentations or poster presentations. Sharp (1996) posited that the common criteria used in assessing oral performance are content and organization, delivery and visual aids. Table 2.1 below presents a summary of criteria used in the assessment of oral presentation in various fields of engineering education:

Table 2.1: Summary of the criteria used in oral presentation assessment.

Research	Criteria	Scale	Engineering field
Marin-Garcia, Miralles & Marin (2008)	*Section A* 1. Eye contact 2. Looks calm 3. Speaking (audible) 4. Readable transparencies 5. Both people take part in actively in the presentation *Section B* 1. Transparency 2. Summarized transparency 3. End before the 3 minutes given 4. Presentation focused on topics subject-related	3-point scale	Industrial Organization
Liow (2008)	*First and second semester* *Presentation (50%)* 1. Oral presentation 2. Visual presentation 3. Interaction with audience 4. Structure of presentation	5-point scale	Civil and Environment Chemical Electrical and Computer Mechanical
Magin & Helmore (2001)	*Formative assessment* Speak loud enough Clear diction Use English appropriately Use of visual aids effectively Adequate eye contact Thesis topic covered adequately Information presented logically Can handle the questions well *Summative assessment* Global mark	10-point scale Over 20 marks/ percentage	Mechanical and Manufacturing

Global summative assessment in Magin and Helmore's study (2001) refers to overall assessment on student oral presentation through giving general comments on students' level of confidence and the effectiveness of the visual aids used in the presentation.

It can be concluded that common measuring criteria are used in assessing students' oral presentations. Generally, the criteria involved are verbal and nonverbal communication skills. As most engineering projects involve calculation, graphs, tables, figures, pictures and charts, the use of visual aids is a must in the assessment of technical oral presentations.

2.1.1.2 Peer Assessment Exercise

Peer evaluation is a useful part of a learning process because it provides significant benefit to both students and instructors. Kovač and Sirković (2012) highlighted that engineering students hold positive attitudes towards peer assessment in oral presentation evaluation. By involving students in peer review activities, particularly in reviewing colleagues' presentations, certain important skills such as giving and receiving feedback is enhanced (Marin-Garcia, Miralles & Marin, 2008). Because of that, students are reported to experience a lower level of speaking anxiety and an improvement in self-confidence (Kovač & Sirković, 2012).

Peer assessment in higher education is often found to be reliable in marking their colleagues' oral presentations (Garcia-Ros, 2011; Marin-Garcia, Miralles & Marin, 2008). Results shows that marks given by the students were similar to the marks awarded by their lecturers. However, engineering students in research studies carried out by Liow (2008) and Margin and Helmore (2001) were found to award higher marks for their colleagues' presentations and the reliability of the peer assessment was low. Liow, therefore, proposed that the reliability of peer assessments of oral presentations should be enhanced. Marin-Garcia, Miralles and Marin (2008) recommended that the engineering students be involved in developing the oral assessment criteria and that the students must also be provided with formal

training to familiarize themselves with assessment criteria. In addition to that, the students who would be assessing their peers' oral presentation must have been involved in previous oral presentation assessments. Margin and Helmore (2001) suggested that reliability of the oral assessment can be achieved by combining marks from teachers with averaged marks obtained from multiple peer assessment.

In conclusion, despite the lack of emphasis given to oral presentation training and assessment to engineering students, oral presentation has always been one of the means of assessing the students' proficiency in the target language. It is also one of the required professional competencies, not only in the field of engineering , but also in other professional areas such as medicine, management and education. In addition, workers with effective presentation skills have more opportunities for job promotion.

2.2 Classifications of Anxiety

Research studies on anxiety started in the early part of the twentieth century, but scant research on human anxiety was conducted because of the lack of proper measuring instruments and ethical problems with inducing anxiety in laboratory settings (Spielberger & Sydeman, 1994). It was only after 1950 that many studies into the research on anxiety were conducted and that research was based on two factors; first the nature of anxiety as a theoretical construct, and second; a number of scales were developed for measuring the construct. Since then, anxiety studies have been reported increasingly in psychological publications, reaching a level eight times as high in the 1960's compared to that of 30 years earlier. The upsurge of the interest in research on anxiety has been linked to numerous experimental works and empirical research on anxiety.

On defining anxiety as a construct, a number of definitions were given. In the early years, Spielberger (1966) defined anxiety as "a complex reaction or response – a transitory state or condition of the organism that varies in intensity and fluctuates over time" (p. 12). Spielberger et al. (1972) considered anxiety as the most common stress response. In more recent years, Derakshan and Eysenck (2009) view anxiety as "an aversive motivational state that occurs in situations in which level of perceived threat to the individual is high" (p. 168). In general terms, anxiety generates negative affective responses such as uneasiness and self-doubt in situations which are perceived as threatening or dangerous. Nevertheless, the feeling of anxiety fluctuates over time according to the stimulus of the situation.

Generally, the extant literature on anxiety classifies it into three types: state, trait and situation-specific anxiety.

2.2.1 State anxiety and trait Anxiety

O'Neil, Spielberger and Hansen (1969) posited that state anxiety (A-State) consists of "feeling apprehension and heightened autonomic nervous system activity that vary in intensity and fluctuate over time" (p. 34). It was argued that it is important to identify the stimulus for the anxiety experienced and the level of response to the stimuli depended on the individual's previous experiences (Spielberger, 1966). However, not all stimulus situations induce anxiety.

Trait anxiety (T-State) refers to "individual differences in anxiety proneness, that is, to differential tendency among individuals to respond with different levels of A-State in situations that are perceived as threatening" (O'Neil, Spielberger & Hansen, 1969, p. 343). For a person with an extreme trait anxiety, most situations are perceived as threatening or dangerous (Spielberger, 1966). Furthermore, there is a

tendency for this person to react with state anxiety response. According to Spielberger (1966), there is a relation between state anxiety and trait anxiety in terms of physical concepts of kinetic and potential energy. State anxiety refers to "reaction which is taking place *now* at a given level of intensity" and trait anxiety indicates "a latent disposition for a reaction of a certain type to occur if it is triggered by appropriate (sufficiently stressful) stimuli" (Spielberger, 1966, p. 16).

The State-Trait Anxiety Inventory (STAI) developed by Spielberger, Gorsuch and Lushene in 1970 was a brief scale which measures both state and trait anxiety in research and clinical settings (Spielberger & Sydeman, 1994). STAI has two subscales which are State Anxiety Scale and Trait Anxiety Scales. Each scale has 20 items which require respondents to rate their agreement or disagreement with the statements using the four-point Likert-scale format.

The latest enhancement on STAI in 1983, which was later known as STAI-Y, comprised of clearer characteristics between state and trait anxiety. For State Anxiety Scale items, the options range from "1 = not at all", and "4 = very much". While point "1 = not at all" refers to the lowest degree of state anxiety, point "4 = very much" indicates the highest level of state anxiety. Examples of (STAI-Y1) items are:

Item 1: "I feel calm"
Item 15: "I am relaxed" (Novy, Nelson, Goodwin, & Rowzee, 1993, p. 346)

The options for Trait Anxiety Scale range from point "1=almost never" and "4=almost always". "1=almost never" option points to the lowest degree of trait anxiety and "4=almost always" option refers to the highest degree of trait anxiety.

Examples of item for Trait Anxiety scale (STAI-Y2) are:

> Item 27: "I am calm, cool and collected"
>
> Item 38: "I take disappointment so keenly that I can't put them out of my mind" (Novy et al., 1993, p. 346)

The STAI score ranges from 20 to 80. The higher score in STAI indicates that the person has a greater anxiety level. The test-retest stability coefficients for STAI-Y were reasonably high, ranging from .65 to .77 for college and high school students (Spielberger & Sydeman, 1994). However, coefficient alpha of STAI-Y in a study by Novy et al. (1993) on adults from different ethnic groups was reported to be more than 0.93. It clearly shows that the items in the instrument are highly reliable to measure state and trait anxiety.

2.2.2 Situation-specific anxiety

MacIntyre and Gardner (1994a) note that situation-specific anxiety pertains "the probability of becoming anxious in a particular type of situation, such as during tests (label as test anxiety), when solving mathematics problems (maths anxiety), or when speaking a second language (language anxiety)" (p.2). It is the feeling of apprehension that arises due to particular situations or events. A form of a situation specific anxiety is anxiety in the context of second or foreign language learning (Onwuegbuzie & Bailey, 2000). A situation such as delivering an oral presentation before others which also creates anxiety among the speakers is also considered a situation-specific anxiety (Baralt & Gurzynski-Weiss, 2011). Specific measurement instruments are developed to measure the level of anxiety, the dimensions of the anxiety and the significant variables that have an impact on the test anxiety. Below are examples of situations and events that are considered situation-specific anxiety:

1. Test anxiety

Test anxiety is noted as a situation-specific anxiety when the level of self-awareness of the anxious person is high during the evaluative situation and the student's performance is affected by that high level of self-awareness (e.g. being videotaped) (Cassady & Johnson, 2002). Research studies on anxiety experienced in testing situations started in the early 1950's. Sarason (1972) posited that test anxiety "has been conceptualized as a tendency to emit personalized task-irrelevant responses when the individual experiences heightened awareness that his performance is being evaluated" (p. 410). The anxiety responses which are produced under stressful situations are manifested through physiological activity such as fast heart rate and sweating palms and "self-deprecation ruminations such as 'I can't pass this test' or 'I wonder how the other students are doing'" (Sarason, 1961, p.202).

The Test Anxiety Questionnaire developed by Sarason and Mandler in 1952 contains items which aim to acquire specific information concerning one's attitudes and experiences in testing situations. In early research studies which focus on students' intellectual performance, findings have shown that test anxiety experienced by students give negative impacts to students' intellectual performance (Sarason, 1963; Sarason, 1961; Sarason, 1959). Anxiety was then considered to be "a learned drive" that generates two different responses. The first response is task-irrelevant anxiety response. This response is emitted because the individual feels incompetent in completing the task, and therefore, tried to avoid the task. This response will lead to poor performance. The other response is known as task-relevant response. Individuals with task-relevant response experienced less anxiety and this response stimulates a learned drive in the individuals to complete the task, hence improving their performance (Sarason, Mandler & Craighill, 1952).

Another instrument that was developed to measure test anxiety is Instrument Test Anxiety Inventory (TAI) by Spielberger (1980). The instrument is used to measure the effect of test anxiety and academic achievement and research studies have shown that test anxiety is correlated negatively with students' academic achievement.

McCarthy and Goffin (2004) posited that test-taking anxiety is composed of two major components/ dimensions: performance anxiety and behavioural anxiety. Performance anxiety is perceived as the feeling of fear over one's performance of a test, while behavioural anxiety refers to 'autonomic arousal' (p. 611) such as bodily tension, manifested by a test taker after taking the test.

2. Language anxiety

Language anxiety can be defined as "the feeling of tension and apprehension specifically associated with second language contexts, including speaking, listening and learning" (MacIntyre & Gardner, 1994b, p. 284). Foreign language (FL hereafter) anxiety is a situation-specific anxiety as it is unique to the FL classroom (Kunt & Tüm, 2010). Many studies have been conducted to examine the effects of anxiety in language learning processes. The Foreign Language Classroom Anxiety Scale (FLCAS) which was developed by Horwitz, Horwitz and Cope (1986) is one of the most widely-used instruments to measure FL anxiety and its relationship with achievement in the target language. They proposed that FL anxiety is composed of communication apprehension, test anxiety and fear of negative evaluation. This instrument has been used in FL research studies with other variables too such as age, gender, self-perceived FL proficiency and perceived self-worth. Park and Lee (2005) studied the relationship among FL learners' anxiety, self-confidence and oral performance among 132 Korean college students attending English conversation

class. Factor analysis and correlation analysis were conducted on the data from the questionnaire which was developed based on studies carried out by Horwitz et al. (1986) and Aida (1994). Results show that self-confidence positively correlated with oral performance, but anxiety debilitates one's oral performance. Park and Lee's findings corroborate with Horwitz et al.'s (1986) Foreign Language Anxiety Framework.

3. Mathematics anxiety

The Mathematics Anxiety Rating Scale (MARS) developed by Richardson and Suin (1972) aims to measure anxiety concerning the manipulation of numbers and the solving of mathematical problems. This instrument is very reliable and is the most commonly used instrument. This instrument underwent several stages of improvement and revisions which has produced MARS-R (1982) and RMARS (1984, 1989) and more recently Electronic Mathematics Anxiety Rating Scale (EMARS) which was developed by Leppavirta (2011).

2.2.3 Facilitating anxiety and debilitating anxiety

In addition to state, trait and situation-specific anxiety, distinction between facilitating and debilitating anxiety is another approach in anxiety research studies. Alpert and Haber (1960) distinguish facilitating anxiety and debilitating anxiety through the effects of anxiety on academic achievement performance. Facilitating anxiety is considered an asset to performance (MacIntyre & Gardner, 1989) as it motivates learners to fight the anxiety by putting extra effort, and so results in higher achievement. Debilitating anxiety, on the other hand, is considered to be detrimental to performance (Derakshan & Eysenck, 2009). Learners who experience debilitating

anxiety run away from sources of anxiety and tend to avoid task completion; thus produce poor performance.

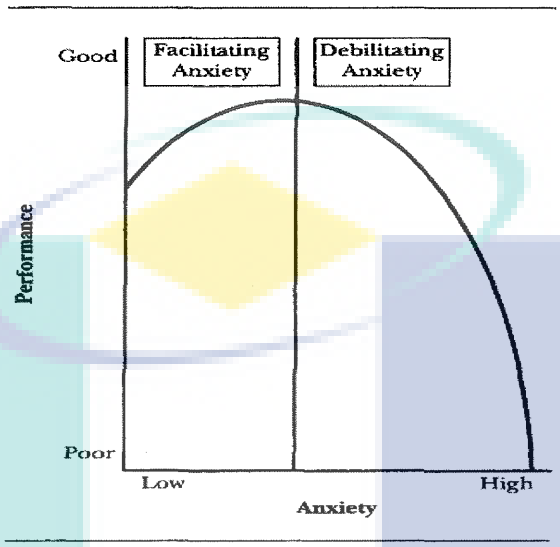


Figure 2.1: Inverted "U" relation between anxiety and performance (MacIntyre, 1995, p. 92)

Figure 2.1 above illustrates the curvilinear relationship between anxiety and performance proposed by MacIntyre (1995). MacIntyre explains that if a person is given a relatively simple task, the anxiety that he/ she experiences might give little negative effect to his/ her performance. In this context, the person may increase his/ her effort and so improves performance. The anxiety experienced by the person is, therefore, known as facilitating anxiety. However, if the task given is highly complex and demands high cognitive processing, the performance may have been negatively impacted by anxiety that he/she experiences. El-Anzi (2005) posits that experiencing anxiety to a certain level may increase academic achievement but if anxiety increases beyond that level, opposite results will be yielded.

One example of a study on debilitating anxiety is a study carried out by Chapell et al., (2005). They examined the impact of test anxiety on academic performance which was based on the students' Grade Point Average (GPA). The

study was conducted on 4000 undergraduates and 1414 graduate students and used Spielberger's (1980) Test Anxiety Inventory. Findings show that the strength of relationship between test anxiety and undergraduates GPA was much stronger compared to the relationship between test anxiety and graduate students' GPA. It was concluded that the higher the test anxiety level experienced by the students, the lower their GPA score. In another study, the Alpert and Haber Achievement Anxiety Test (1960) was administered to identify the type of anxiety among 41 volunteers from an American public university (Moyer, 2008). Results show that more respondents experienced debilitating anxiety and that type of anxiety inhibited their performance. It was proven through more errors which were made by them in the experiment involving identification of the Wedgits, a building toy structure. However, Moyer posited that besides self-perception questionnaires, factors such as skills and competitive situation may also have great effects and significant contribution in determining anxiety type.

In measuring facilitating and debilitating anxiety, the Achievement Anxiety Test (AAT) was developed by Alpert and Haber in 1960. The questionnaire which aims to identify students' academic achievement performance has two sections that distinguished facilitating anxiety and debilitating anxiety. The Facilitating Anxiety Scale has nine items. They were constructed based on "a prototype of the item - 'Anxiety helps me to do better during examinations and test" (Alpert & Haber, 1960, p. 213). The Debilitating Anxiety Scale has ten items and the items were developed based on "Anxiety interferes with my performance during examinations and tests'" (Alpert & Haber, 1960, p. 213). It was reported that the test-retest reliability coefficient for a period of over ten weeks was .83 for the Facilitating Anxiety Scale

and .87 for the Debilitating Anxiety Scale. In the questionnaire, all items from both scales were randomly mixed. All items were rated on a five-point Likert Scale.

The sample items from the Facilitating Anxiety Scale are:

2. I work most effectively under pressure, as when the task is very important.
11. Nervousness while taking a test helps me do better.
14. In courses in which the total grade is based mainly on *one* exam, I seem to do better than other people. (Alpert & Haber, 1960, p. 213).

The sample items from the Debilitating Anxiety Scale are:

1. Nervousness while taking an exam or test hinders me from doing well.
6. The more important the examination, the less well I seem to do.
17. I am so tired from worrying about an exam, that I find I almost don't care how well I do by the time I start the test. (Alpert & Haber, 1960, p. 214).

Results from Alpert and Haber's (1960) study shows that using specific anxiety scale such as AAT can better predict academic achievement.

The present study investigates a form of a situation-specific anxiety, that is technical oral presentation (TOP) anxiety in chemical engineering classroom at tertiary level. MacIntyre and Gardner (1991) posited that the situation-specific approach "offers more to the understanding of anxiety because the respondents are queried about various aspects of the situation" (p.91). The situation-specific approach to the study of academic oral presentations offers "more meaningful and consistent results" (MacIntyre & Gardner, 1991, p. 92). The discussion on the role of anxiety as facilitating or debilitating to students' performance is presented in Chapter 5.

2.3 Theories and concepts related to Anxiety and Performance

The proceeding section provides descriptions on theories and concepts underpinning this research study to help understand the anxiety experienced by the

engineering students, the relationship between anxiety and performance and the factors that are perceived to contribute to the feelings of anxiety among the engineering students. Strongman (1995) suggested that for a more complete understanding of anxiety, it is important to examine its cognitive aspects and influences.

2.3.1 Oral Communication Apprehension (OCA)

Communication apprehension is a broadly based anxiety related to oral communication (McCroskey & Beatty, 1984). Specifically, McCroskey (1977, p. 78) who is a leading researcher in communication apprehension defines oral communication apprehension as "fear or anxiety with either real or anticipated communication with another person or persons". Oral communication apprehension (OCA hereafter) is also associated with reticence, shyness, anxiety and unwillingness to communicate. Research on OCA started in 1970's which is more than three decades ago. Earlier in the 1970's, research on OCA mainly focused on speech communication and other related constructs such as reticence and shyness. To date, interest in OCA has spread to other disciplines, nations and cultures (McCroskey, 1982b).

2.3.1.1 Conceptualization of Oral Communication Apprehension

There are several types of OCA, namely trait-like, context-based, person-group and situational.

1. Trait-like Communication Apprehension

According to McCroskey (1982b, p. 147), trait-like OCA represents "a relatively enduring, personality-type orientation toward a given mode of communication across a wide variety of contexts". He separated the term trait-like

and trait OCA intentionally as the examples of true trait of one person are eye colour and hair. In contrast to true trait which will not change, trait-like are highly resistant to change, can be and often are changed during adulthood. To measure the presence of trait-like communication apprehension, McCroskey developed the Personal Report of Communication Apprehension (PRCA) in 1970. According to his own research on trait apprehension among undergraduates in American universities, approximately 20% of the undergraduates experienced high trait-like OCA. Usually, the score of PRCA questionnaire for one person will be highly similar across an extended period of time.

2. Context-based Communication Apprehension

McCroskey (1982b, p. 147) defines context-based OCA as "a relatively enduring, personality-type orientation toward communication in a given type of context". The contexts include giving speech in public, speaking in meetings or classes, speaking in small group discussions and speaking in dyadic interactions. The first OCA test that was developed to measure OCA in public speaking is Personal Report of Confidence as a Public Speaker (PRCS) by Gilkinson (1942) and followed by Paul (1966) and later, Personal Report of Public Speaking Anxiety (PRPSA) developed by McCroskey (1970). A person, who experiences a high level of context-based communication apprehension for example in public speaking, may be completely relaxed in other communication contexts.

3. Person-group Communication Apprehension

Person-group OCA or also known as audience-based OCA is viewed as "a relatively enduring, personality-type orientation toward communication with a given person of group of people" (McCroskey, 1982b, p. 148). This type of OCA is trigged by some individuals or groups of people or some unfamiliar individuals or groups of

people regardless of communicative contexts. For instance, students at school may be highly apprehensive about talking to their principal regardless of the venue, be it in the hall or canteen.

4. Situational Communication Apprehension

Situational OCA is "a transitory orientation toward communication with a given person or group of people" (McCroskey, 1982b, p. 149). This type of OCA is generated by a unique combination of audience, time and context. For instance, a staff member may not feel apprehensive when talking to her superior during meal time, but will experience high level of situational OCA when she is interviewed by her superior for job promotion. Novelty (e.g. giving a speech), formality, subordinate status, conspicuousness, unfamiliarity, and degree of attention from others may be the causes for situational OCA.

2.3.1.2 Treatment for oral communication apprehension

McCroskey (1982b) suggested that treatments could focus on communication behaviours or on cognition. In other words, a person should be given proper guidance to improve his or her skills in communication within or across contexts, or to lower his or her level of apprehension in participating in communication within or across contexts (McCroskey, 1982b). There are 3 systematic treatment methods developed by psychologists currently used to treat individuals with high level of OCA, and those are systematic desensitization, cognitive modification and skills training.

Systematic desensitization which is the most successful method for people with high OCA is a form of "behaviour modification derived from a learning theory" (Berger, McCroskey & Richmond, 1984, p. 153). The underlying principle of this treatment is that communication apprehension is a learned behaviour. It is believed that any learned behaviour is believed can be unlearned. This method involves 2

main steps, which are recognizing tension and followed by relaxing the tension. Even though it is found effective for quiet people, it still has some limitations. More research is encouraged to examine this technique with people who are quiet because they "have skills deficiencies, are social introverts, socially alienated, or ethnically or culturally divergent from their surrounding society" (Berger, McCroskey & Richmond, 1984, p. 154).

Cognitive modification, which is also based on learning theory, modifies negative rehearsal statements to positive rehearsal statements (Honeycutt, Choi, & DeBerry, 2009). The person who is receiving treatment will be helped to identify and list negative self-statements that he or she makes about his or her communication abilities. Afterwards, all the negative statements will be replaced with coping or positive statements and this step must be practiced continually. Berger, McCroskey and Richmond (1984) suggest the combination of cognitive modification technique with systematic desensitization in order to increase its effectiveness in treating one's OCA.

The last OCA treatment method is *skills training.* This technique benefits people with skills deficiency, and those who have no problem with communication apprehension. If these people suffer from OCA, the OCA must be treated prior to having skills training, for example, by joining a public speaking class.

In the context of the present study with ESL engineering students, understanding the general concept of oral communication apprehension is fundamental because MacIntyre and Gardner (1991) posit that it is "form of oral communication apprehension that operates specific to second language contexts" (p. 104). The fact that ESL learners face difficulties in producing and comprehending messages well, the feeling of frustration over the communicative context is

potentially present. As such, it is imperative to note the consequences of oral communication anxiety experienced by an individual on his/ her future attempt to communicate as they might abort or avoid similar communication contexts.

2.3.2 Social Cognitive Theory

This current study works within the Social Cognitive Theory proposed by Bandura (1986). Social cognitive theory was derived from the social learning theory proposed by Miller and Dollard (1941). In 1963, Bandura and Walters wrote "Social Learning and Personality Development ", in which they expanded the social learning theory through the introduction on observational learning principle and vicarious reinforcement principle. However, in 1977, Bandura realized that there was one important element missing from the theory, that is, self-belief or self-efficacy. In his theoretical framework of social cognitive theory, he posited that human achievement depends on the interaction between one's behaviours, personal factors and environmental conditions (Figure 2.2).

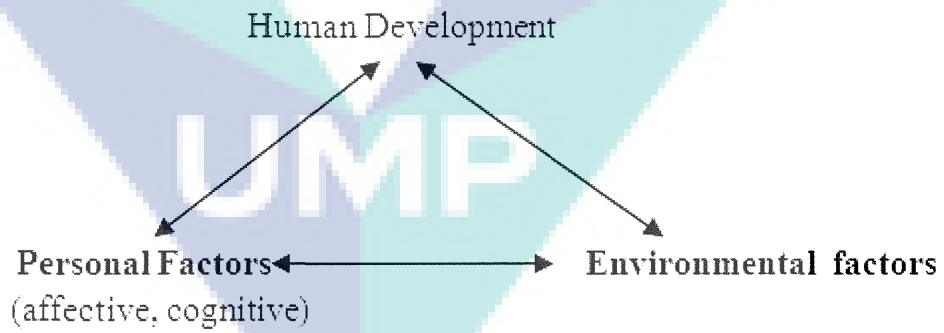


Figure 2.2: Bandura's concept of triachic reciprocity behaviour (Bandura, 1986)

The interaction between these three factors differs based on the individual, the particular being examined, and the specific situation in which the behaviour occurs (Bandura, 1989). He added that the person-behaviour interaction involves the bi-directional influences of one's thoughts, emotions and biological properties and

one's action. For instance, a person's self-perceptions will shape one's behaviour. However, the behaviour shaped will then affect one's thoughts and emotions. A bi-directional interaction also occurs between the environment and personal characteristics (Bandura, 1986). In this process, human expectations, beliefs and cognitive competencies are developed and modified by social influences and physical structures within the environment. The final interaction occurs between behaviour and the environment. A person's behaviour will determine the aspects of their environment to which they are exposed, and behaviour is, in turn, modified by that environment. For example, an aggressive person may create a hostile environment.

In the Social Cognitive Theory, self-efficacy refers to the beliefs about one's capabilities to learn or perform behaviours at designated levels (Bandura, 1986). It is believed to have control over one's thoughts, feelings and behaviour. In other words, the beliefs on one's ability will influence the way they will behave (effort and goal setting) and the outcome of the effort. Efficacy beliefs "how influence how people feel, think, motivate themselves and behave" (Bandura, 1993, p. 118). Beliefs about being able to achieve one's goals are affected by successes and failures. In addition, cognition plays "a critical role in people's capability to construct reality, self-regulate, encode information and perform behaviours" (Pajares, 2002, p.1).

Anxiety in relation to social cognitive theory is characterized as "a set of loosely coupled components embodying apprehensive cognitions, physiological arousal and avoidant behaviour" (Bandura, 1988, p. 77). He added that "perceived self-efficacy to exercise control over potentially threatening events plays a central role in anxiety arousal" (Bandura, 1988, p. 78). According to Bandura (1988, p.78), threat is defined as "a relational property concerning the match between perceived

coping capabilities and potentially hurtful aspects of the environment". Therefore, to understand how people react to the threat, analyzing their perceived coping capabilities of the situation is necessary. Bandura posited that people who believe they cannot manage potential threats experience high levels of anxiety arousal and vice versa (p.78). Managing the threats can be achieved both behaviourally and cognitively. In behavioural control, one does things to stop or decrease the risk of an event. In cognitive control, a person controls his mind by believing in his capability in managing the threatening situations through constructing positive statements over the situation.

Self-beliefs of efficacy gives impact on how individuals use the capabilities they possess (Bandura, 1988). Therefore, individuals equipped with similar sub skills but with low self-beliefs of efficacy may give poorer and inadequate performance. Individuals with high self-beliefs of efficacy may perform better and more extraordinarily. He claims that "human action is governed largely by perceptions of personal efficacy and social environments rather than objective properties" (Bandura, 1988, p. 88).

It can be concluded that people with a low sense of self-efficacy will avoid difficult and challenging tasks, which they perceive as personal threats. These people have low aspirations and commitments, slacken their efforts and can easily lose faith in their capabilities. In contrast to that, people with a strong sense of efficacy can enhance personal success in various ways (Bandura, 1993). These people approach difficult tasks as challenges to be mastered and opportunities for them to show their strong commitment and great effort to control the situations. Bandura (1993, p. 145) viewed self-efficacy beliefs as "the product of a complex process of self-persuasion that relies on cognitive processing of diverse sources of efficacy information

conveyed inactively, vicariously, socially and physiologically" and once formed, it has great and significant contribution to the "level and quality of human functioning". Furthermore, according to this theory, the perceptions about one's abilities and characteristics will determine the degree of his effort and level of motivation and guide his behaviour in completing the task (Bandura, 1977).

In applying this theory to the context of this study, technical oral presentation anxiety and students' oral presentation performance is characterized as the result of the interaction of specific environmental factors and students' characteristics.

2.3.3 Recursive Framework of Anxiety, Cognition and Behaviour

MacIntyre (1995) developed this Recursive Framework of anxiety, cognition and behaviour while commenting on the Linguistics Coding Deficit Hyphothesis by Sparks and Ganchow (1991) which ignores the significant role of affective variable that is language anxiety in determining individual differences in language learning achievement. MacIntyre (1995) highlighted other previous research which show the negative impact of language anxiety on language learning and performance.

According to MacIntyre (1995), language anxiety can be considered as a type of social anxiety. The variables in the framework (anxiety, cognition and behaviour) developed reflect the dimensions of social anxiety.

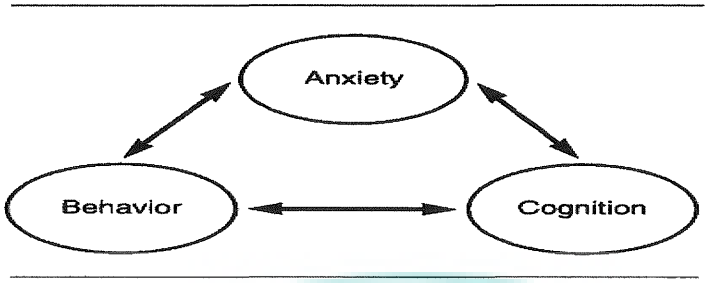


Figure 2.3: Recursive relations among anxiety, cognition and behaviour (MacIntyre, 1995, p. 93)

Figure 2.3 above demonstrates the recursive or cyclical relations among anxiety, cognition and behaviour proposed by MacIntyre (1995). The framework is connected recursively/ cyclically because each variable has an impact on the other. MacIntyre (1995) asserted that while anxiety could adversely affect cognitive processing and deteriorate individual performance, individual performance could also aggravate anxiety.

Looking at the construct in the framework, anxiety can be perceived as "self-preoccupation over the inability to respond to the call" (Sarason, 1984, p. 936). MacIntyre (1995) posited that the preoccupation experienced by the person is often translated as negative cognition interference that negatively affects the quality of task performance. The feelings of anxiety include affective experiences such as feelings of apprehension and fear. MacIntyre (1995) discussed the anxiety construct found in the framework in relation to trait anxiety and state anxiety. For a person with an extreme trait anxiety, most situations are perceived as threatening or dangerous (Spielberger, 1966), while a person with a state anxiety gives immediate response to a particular situation. The anxiety in this framework refers to state anxiety arousal.

Cognition, as a second construct plays a significant role on the feeling of anxiety and one's performance. Worry over performance is commonly found in

evaluative situations (Sarason, 1984). Sarason (1984) posited that cognitive interferences such as negative self-appraisal or self-related cognition have negative effects on the performance of highly test-anxious people because highly anxious people demonstrated greater cognitive interference. When the negative cognitive interferences such as negative evaluation and low self-esteem consume cognitive resources of a person, cognitive processing is adversely affected. Cognitively, the person would be overwhelmed by the negative cognitive interference and this reduce his/ her cognitive ability to focus on tasks at hand, so affected his performance. If any techniques or ways to bring highly anxious people to give more concentration on task at hand (and reduce the negative cognitive interference), then the effect can be facilitative (Sarason, 1984).

The behaviour dimension includes responses made by people who are affected by anxiety. For people who experience high anxiety, the tendency to avoid the anxiety-provoking situation or effort to escape from the situation is high. MacIntyre and Thivierge (1995) posited that in the context of public speaking, the speaker may have planned to give a short speech by not covering necessary information, hence it affects the quality of the overall performance.

The framework developed by MacIntyre (1995) is mostly encountered in language learning contexts. Even though it is used to explain the role of anxiety in language learning achievement, it is also applicable to any learning context which emphasizes task performance. In the present study, technical oral presentation anxiety and technical oral presentation performance are examined. Technical oral presentation anxiety is a socially based anxiety as it involves socially evaluative situation in which the students' performances are assessed by evaluators (Rapee & Heimberg, 1997). Bodie (2010) also posited that public speaking anxiety or in this

study, technical oral presentation (TOP) anxiety is a subtype of social anxiety (p.77). As such, the recursive model of anxiety, cognition and behaviour is adaptable to the context of present study. This study attempts to use this model to discuss technical oral presentation anxiety in relation to cognitive process and students' performance in an engineering classroom.

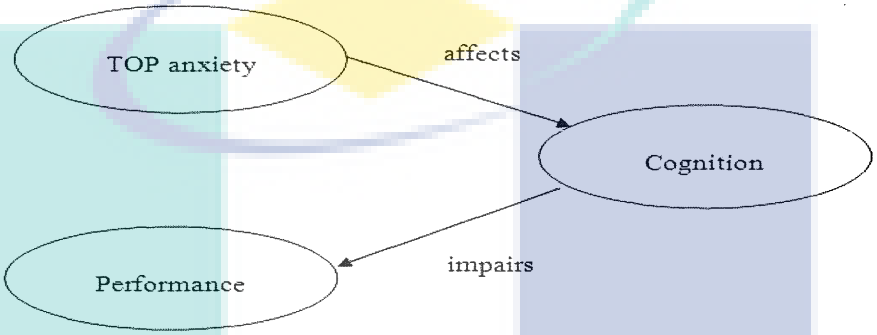


Figure 2.4: The relationship between TOP anxiety, cognition, and performance

Following MacIntyre's model (1995), Figure 2.4 illustrates the relationship between student's cognition, TOP anxiety and student's performance. The feeling of TOP anxiety experienced by the student affects his/ her cognitive processing and it impairs the performance of the student.

2.3.4 Processing Efficiency Theory (PET)

Borrowing from cognitive psychology theory on cognitive anxiety, the Processing Efficiency Theory (PET hereafter) developed by Eysenck and Calvo (1992) is applied in this study to explain the impact of state anxiety experienced by the engineering students during their URPII final oral presentation performance. This theory is generally applicable to cognitive-task performance conditions, to high anxiety experienced by normal people and to analyze stress situations. The central prediction of PET is that "the adverse effects of anxiety on performance effectiveness are often less than those on processing efficiency" (Eysenck & Calvo, 1992, p. 417).

Performance effectiveness refers to the quality of the task performance, while processing efficiency is the relationship between the effectiveness of performance and the amount of effort (processing resources) invested to achieve the level of performance.

Task-irrelevant thoughts such as worry (which is an important construct in PET) are assumed to adversely affect processing efficiency (Derakshan & Eysenck, 2009). Some examples of the worry that people experience are "self-preoccupation, concern over evaluation and concern over level of performance" (Eysenck & Calvo, 1992, p. 414). According to PET, cognitive anxiety or worry affects task performance in several ways. Worry is predicted to reduce the processing and storage capacity of the working memory system. Its adverse effect is greater on given tasks which demand considerable capacity of the working memory system. In this case, worry causes a distraction from giving full attention to the task. Rauh and Seccia (2006) assert that the anxiety always induces negative effects.

However, in PET, Eysenck and Calvo (1992) posit that worry can function as a motivational factor too. The motivational factor functions as an agent to create more processing resources, which is known as effort. In addition, it also instigates processing activities in the form of strategies that eventually improve performance. In coping with the threat and worries about his/ her poor performance, a person with a high anxiety level will be more likely to generate additional effort (i.e. processing resources) and/ or constructing strategies (i.e. processing activities). The adverse affect of anxiety over task performance can be counteracted by the increasing efforts and/ or developing effective strategies, so enhancing the performance level.

According to PET, a control or self-regulatory system which is located within the working memory system is believed to have a level of control over the highly

anxious person's response to poor performance. The control system works in two ways. First, the highly anxious person may cope with the threat and so decreases the level of worry he/ she experiences. In this event, more capacity for working memory is developed. Second, a person with high anxiety level may reduce or remove the negative effects of worry on task performance by putting in extra effort (increasing processing resources) to improve his/ her performance. The various functions of the control system signify the complex features of the human working memory system.

PET was developed based on the assumption that the level of state anxiety (not trait anxiety) determines the variations found among individuals in terms of internal processing and performance. Eysenck and Calvo (1992) make the assertion that the control system works more actively in highly-anxious individuals by producing additional processing resources or activities. It was reported that an individual with a high state anxiety level transfers the negative effect of worry to a motivational factor that improves his/ her performance. In addition, the highly-anxious individual tends to allocate extra effort (processing resources) to eliminate his/ her worry. Furthermore, the individuals in the high anxiety group have a tendency to have high expectations on themselves regarding their own performance. As such, they are more likely to identify the mismatch between performance and expectation. PET predicts that "an increase in cognitive anxiety can lead to an increase in effort and performance" (Rauh & Seccia, 2006, p. 588).

According to Murray and Janelle (2003), PET is a theory that considers anxiety as having both facilitative and debilitative effects on one's performance. As such, this theory adequately accounts for the anxiety experienced by the engineering students in delivering technical oral presentation anxiety and its relationship with their performance in the oral presentation assessment.

2.4 Conceptual framework of present study

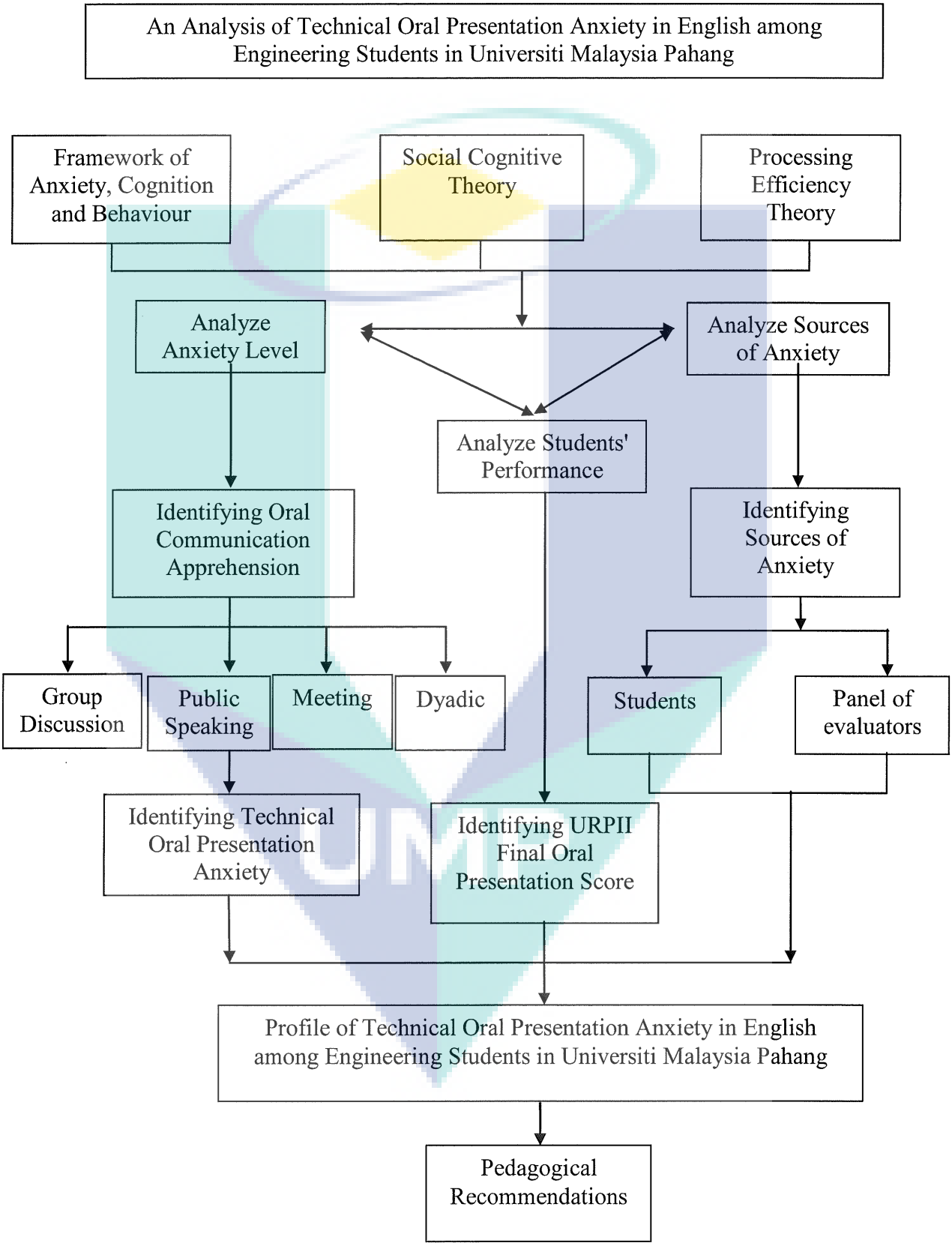


Figure 2.5: The Conceptual Framework of the Present Study

Figure 2.5 above presents the conceptual framework of the present study that makes use of the Social Cognitive Theory (Bandura, 1986), the Processing Efficiency Theory (Eysenck & Calvo, 1992) and the Recursive Framework of Anxiety, Cognition and Behaviour (MacIntyre, 1995) as theories underpinning the study. In addition, the concept of oral communication apprehension (McCroskey, 1982b) is also embedded in the study to further understand the anxiety experienced by students in delivering technical oral presentations.

2.5 Related research on anxiety in oral presentations

Quite a number of research studies on anxiety associated with giving oral presentations have been conducted. However, research on anxiety in oral presentations has always been discussed under public speaking anxiety. Therefore, this section will cover recent research related to anxiety in academic oral presentations as well as public speaking anxiety in relation to oral communication apprehension (OCA).

Research studies on oral presentation anxiety or public speaking include investigations on the degree of anxiousness experienced by the students, factors that contribute to oral presentation anxiety and methods in coping with oral presentation anxiety. Elliot and Chong (2004) investigated the level of presentation anxiety among 550 first year psychology and business undergraduate students in one university in Australia. The student population comprised international and citizen/ permanent resident students whom English is their first language or second/ foreign language. In the questionnaire distributed, the students were asked to rate their level of anxiety based on their anticipation in giving a presentation, during the presentation and the perceived effects of anxiety on their performance. Results found that

approximately one-third of the sample reported to experience high or very high level of presentation anxiety and majority of them believed that their anxiousness adversely affected their performance in presentations. In addition, the students were also asked to provide reasons for their anxiety in giving oral presentations. They found 3 main reasons; the presentations itself (the content, equipment, and dealing with questions), personal attributes (communication aspects e.g. stuttering, language, physical appearance, anxious disposition) and evaluation (self-evaluation, reactions of others and grades).

A comparative study of Lithuanian and foreign students of a university in Lithuania aimed to determine the students' attitude towards delivering oral presentations in English in an ESP course and also the causes for their sometimes unsuccessful presentations. In the study conducted by Janulevičienė and Kavaliauskienė (2011), a set of questionnaire was distributed to a total of 83 ESP first and second year students of the Social Work Faculty and Law Faculty from the Mykolas Romeris University in Lithuania. Results show that more foreign students like doing oral presentations compared to Lithuanian students. Students ranked fear of speaking to be the major difficulty in doing presentation, followed by question time and audience reaction. Evaluation mark was ranked last. It could be implied that these students experience a certain degree of anxiety in delivering academic oral presentations in English. The findings also show that students' low level of English proficiency has negatively impacted their oral presentation performance. The students reported to face difficulty in speaking naturally during the presentation, so, they tend to memorise the prepared speech which causes the speech produced sounds unnatural and writing-like. Besides that, referring to notes and making mistakes in

pronunciation and spelling are also some of the weaknesses reported in delivering oral presentations in English.

Similar study and similar findings were reported in another study. Kavaliauskienė (2006) also distributed a set of questionnaire to 60 ESP first and second year students from the Faculty of Social Work, Mykolas Romeris University. A similar finding was found where majority of the students felt anxious in delivering oral presentations in English. However, differences in the results were detected in the ranking of the difficulties in delivering presentations whereby students in this study ranked evaluation mark second (together with the reaction of the audience) and question time was ranked last. It can be implied that fear of negative evaluation and the response made by audience have significant contribution to the students' oral presentation anxiety.

Kavaliauskienė's (2006) study was extended by Tong (2009) who used a different social context, participants and methodology. Tong (2009) conducted a study with 100 ESP second-year students and two ESP teachers of College of Technology in Vietnam National University. She distributed a questionnaire to gather data from the students and conducted interviews with two ESP teachers. Results show that both students and teachers hold almost similar perceptions of the students' difficulties in delivering oral presentations in English. It was found that lack of presentation skills, fear of negative evaluation and low self-confidence were among the major hindrances for students to deliver oral presentations effectively. While the teachers acknowledged that most students experienced oral presentation anxiety, results show that only 30% of the students in the study reported to feel anxiety in oral presentation delivery.

Vevea, Pearson, Child and Semlak (2009) surveyed 605 undergraduate student's level of public speaking anxiety in public speaking courses held in two Midwestern Universities. McCroskey's (1982a) PRCA-24 questionnaire was distributed to determine the oral communication apprehension (OCA) of the students. They also examined how factors such as unwillingness to communicate, self-esteem and gender affect students' OCA levels in public speaking courses. Results showed that unwillingness to communicate is the highest predictor for OCA among the students. In addition, self-esteem is found to have a negative relationship with communication apprehension. The result implies that the higher one's self esteem, the lower his or her OCA level.

Several research studies have been conducted in the methods of coping with speech anxiety. A recent research study by Finn, Sawyer and Schrodt (2009) investigated whether the strategy of brief exposure therapy can help in alleviating public speaking anxiety among 140 students (English native speakers) who enrolled in a basic communication course in a private university in the United States of America. This quasi-experimental design study required students to deliver informative speech in the pre-test and persuasive study in the post test. In between the two tests, students in the experimental group received multiple exposure speaking assignments (called TRIPLESPEAK assignments), while students in the control group were given other assignments, which were not related to public speaking. The study utilized PRCA-24 questionnaire and State Trait Anxiety Inventory (A-STAI) to measure students' state public speaking anxiety level. Results from statistical analysis shows that the TRIPLESPEAK assignments successfully decreased the state public speaking anxiety experienced by the students. This implies that with brief repeated

exposure strategy is one of the effective strategies in helping students alleviating their public speaking anxiety.

Francis and Miller (2008) who carried out a study with first generation Northwest Arkansas Community College students aimed to investigate the students' levels of oral communication apprehension and their ways of alleviating oral communication apprehension. The first generation students comprised the native and foreign-born students who were categorised as at-risk students who faced academic and communication challenges. The ESL student population involved Caucasian, Hispanic, Asian, American Indian and African-American. PRCA-24 was distributed and results showed that the students were reported to be apprehensive in their oral communication and they scored high in public speaking context on the questionnaire. Students were reported to apply several strategies such as communication-orientation modification (COM), guided visualization and skills training to lower their oral communication apprehension. COM technique helps students to view public speaking as a conversation instead of a performance (which demands more effort), and students found the method to be very helpful in managing their CA in public speaking. Besides that, being fully prepared for the speech and practicing modified physical response such as taking a deep breath during the speech event give more confidence to the students in oral communication and to deliver public speaking effectively. Furthermore, skills training and practise humor also are said to give benefits to the students in alleviating their oral communication apprehension and public speaking anxiety.

Kostić-Bobanović and Bobanović (2007) introduced affective strategies to 202 Faculty of Economics and Tourism students in a Croatian college to cope with their public speaking anxiety. The study was carried out in two phases. In the first

phase, the 202 ESP students were given Personal Report of Public Speaking Anxiety (PRPSA-34) questionnaire at the beginning of their ESP course to determine their level of public speaking anxiety. During the semester, students were introduced to nine affective strategies in helping them to alleviate their public speaking anxiety. Among the affective strategies taught were laughing to overcome nervousness and making encouraging statements to motivate oneself in order to increase their confidence level. After the instructions, PRPSA-34 questionnaire was distributed again. Results from PRPSA-34 show that at the beginning of the semester, student were reported to experience highly (51) and moderately high (39) in giving a public speech. After the affective strategies instructions, only 13 students experienced high anxiety and 23 students experienced moderately high anxiety in speaking in public. Statistical analysis shows that these affective strategies were effective and successfully reduced students' high level of speech anxiety.

Dupagne, Stacks and Giroux (2007) examined the effects of technology in reducing public speaking anxiety (state CA) and trait CA. The study involved 72 English native students who enrolled in basic public speaking class. PRCA-24 questionnaire was given to the students to measure their oral communication apprehension. The students were required to give a total of 5 speeches which contained introductory, special occasion, informative, persuasive and final speeches. All speeches made in the treatment group were video recorded, uploaded and can be accessed through streaming links via the course website, BlackBoard. Majority of the students in the treatment groups agreed that online speeches gave benefits to them. However, statistical analysis shows that video streaming does not significantly reduce public speaking anxiety and trait communication apprehension.

From the literature above, it can be summarized that many research studies conducted on oral presentations mainly focused on the students' levels of anxiety, the difficulties faced by the students in delivering oral presentations and the interventions in decreasing oral communication apprehension and speech anxiety. In the present study, however, the researcher does not only investigate students' levels of technical oral presentation (TOP) anxiety, but she also examines the relationship between the students levels of TOP anxiety and their performance in technical oral presentation assessment in the context of engineering education.

2.6 Related research on anxiety in oral presentations in Malaysia

With respect to related research on technical oral presentation (TOP) anxiety in Malaysia, there has been scant research carried out in this area. Even though there are studies on technical oral presentations, they do not investigate the students' anxiety experience in delivering the presentation. Therefore, this section will also include descriptions on recent research studies conducted on oral presentation anxiety or public speaking anxiety in relation to oral communication apprehension (OCA) among Malaysian ESL learners.

Several research studies on technical oral presentations were conducted but the aims were diverse. Mariana Yusoff (2010) conducted a study on engineering students' oral communication competence in technical oral presentation. Specifically, she investigated students' competencies in describing specific concepts, explaining technical contents and clarifying ideas in the Body/ Content section of the technical oral presentations. This ethnographic study involved 23 third year and final year engineering students from 2 public universities who were attached in several engineering companies for their Industrial Training programme. The students were

interviews were conducted with the internal and external examiners. Results from the questionnaire and findings from the interviews show some similarities and differences. Both students and examiners believed high confidence level, sound methodology and clear visual presentations were important skills and attributes for effective presenters. In terms of language use, examiners and students advised the presenter to avoid use of complex items and ensure that correct pronunciation is used in the presentations. In addition, presenters must also be sensitive to the rate or speed of the presentations and to project their voice clearly so that it is audible and clear to the audience. Examiners highlighted that presenters must have a wide knowledge of the project conducted and be aware of the real life application of their project for the benefits of the community as a whole.

Mohd Radzuan, Ali and Kassim (2008) investigated the criteria for technical oral presentations as perceived by the engineering faculties in Universiti Malaysia Pahang and the engineering-related companies which have offered places for Industrial Training programme for UMP students. Utilizing an Oral Presentation Questionnaire (OPQ) for industries and official faculty documents (the marking scheme for Undergraduate Research Project (URP) oral presentations), similarities and differences from both instruments were analyzed. Across the five engineering faculties in UMP, it was found that most faculties gave the highest marks on technical content, followed by the ability to answer questions in question and answer session, students' communication skills, creativity and innovation as well as effective visual aids. Some similarities and differences were reported in terms of the emphasis given by industries and the faculties. Industries perceived elements such as the organization of the oral presentation, content or the technical knowledge, language and delivery style must be given due weightage, while faculties viewed content and

the ability to answer questions during question and answer session to be awarded higher weightage. It is also important to highlight that industries perceived the usage of correct technical jargons and English language fluency in oral presentations to be more important than language accuracy. The findings indicate the significance of oral communication skills in students' technical oral presentations.

Based on the studies on technical oral presentation in Malaysia, none focused on the anxiety experienced by the engineering students, which is investigated in this study.

This section also describes related research studies conducted on oral presentation anxiety or public speaking anxiety in relation to oral communication apprehension (OCA) among Malaysian ESL learners. A recent study on OCA in a Malaysian context was conducted by Syed Wasif Gillani, Azmi Sarriff, Syed Azhar Syed Sulaiman, Nik Abdul Halim and Yelly Oktavia Sari (2010) with 1079 undergraduate students in two public universities in Malaysia. The main aim was to determine the relationship between students' OCA levels and students' learning style. Utilizing PRCA-24 questionnaire, the students' levels of OCA was determined. The students' learning styles were indicated with reference to the Grasha-Reichmann model. Results showed that a majority of the students (54%) experienced moderate OCA. These students were found to be positively correlated with collaborative learning style (such as group discussion) and competitive learning styles. While low OCA students were more active respondents and independent, high OCA students would apply avoidant learning styles. Similarly, skills training method has also helped students to alleviate their communication problem and reduce their OCA. They also suggested methods to reduce students' OCA. They proposed a more collaborative learning style such as group discussion, presentation orientation and

oral discussion to be introduced and applied by instructors in classes because these activities are believed to help decrease students' levels of OCA.

Another research study on OCA was conducted by Wan Zumusni Wan Mustapha, Noriah Ismail, Singh and Suhaidi Elias (2010). Their objectives were to identify ESL students' levels of OCA and the type of communicative events they prefer to engage in. A total of 50 business and marketing undergraduate students of Universiti Teknologi Mara (UiTM) participated in this study. They were required to complete the PRCA-24 questionnaire to identify their level of OCA in English and results showed that almost majority of the students (45%) experienced high level of OCA in English. Students were also reported to enjoy group discussions and meetings, compared to delivering oral presentation in English. The least preferred communicative event is public speaking. In this study, oral presentations refer to presentations conducted in a classroom which usually involves familiar audience, who are their classmates. Public speaking on the other hand, refers to speeches made outside classroom and in a new environment. The fact that the audience is strangers, it heightens their anxiety level.

In a related study, Nazira Osman, Surina Nayan, Mahani Mansor, Anis Maesin and Latisha Asmaak Shafie (2010) carried out a study to determine the effects of collaborative learning on students' oral communication skills and spoken skills. A total of 56 students of Diploma in Banking and Diploma Investment Analysis from Universiti Teknologi MARA (UiTM), Perlis participated in this quasi experimental study. During the treatment period, students in the experimental group were required to be involved in group discussion activities. McCroskey's (1982) PRCA-24 questionnaire was given during the pre and post-test. Students were reported to experience moderate level of anxiety in public speaking. Results from the

statistical analysis also show that students' level of communication apprehension in public speaking was not decreased from the collaborating activities treatment. It indicates that in order to alleviate students' public speaking anxiety, another kind of treatment is needed.

Ayu Rita Mohamad and Nadhia Dalila Ab Wahid (2009) from the Industrial University of Selangor (UNISEL) explored potential sources of anxiety in relation to public speaking in English as a second language. An adapted version of Foreign Language Classroom Anxiety Scale (FLCAS) was distributed to 150 students from the Faculty of Industrial Management from UNISEL. Analysis from the open-ended section of the questionnaire showed that the major sources of public speaking anxiety among the students were fear of the perception of others, limited English proficiency and lack of knowledge due to inadequate preparation for the speaking task.

Similarly, Devi and Feroz Farah Shahnaz (2008) conducted a study on oral communication apprehension and communication competence on 32 ESL electrical engineering students in Universiti Teknikal Malaysia (UTEM) in Malaysia. The Personal Report Communication Apprehension (PRCA-24) and Self-Perceived Communication Competence (SPCC) questionnaires were given to the students. Results from the questionnaires showed that a majority of the students had moderate OCA levels and moderate level of communicative competence in all communication contexts such as public, dyad and groups as well as in communicating with strangers, acquaintances and friends. From the lecturers' evaluation on students' oral presentations, most students were found to fall under modest speakers. To determine the correlation between PRCA-24 and SPCC, Pearson Correlation Coefficient was conducted and results showed a negative relationship between students' communication competence and students' OCA levels. It indicates that students will

experience less communication apprehension when they have high self confidence in the oral competency. Statistical analysis also showed that there was no relationship between PRCA-24 scores and lecturers' evaluation, however, a moderate degree of correlation was found between students' communicative competence and lecturers' evaluation. It clearly shows that students' anxiety does not have impact on their oral presentation, unlike their self-perceived communication competence.

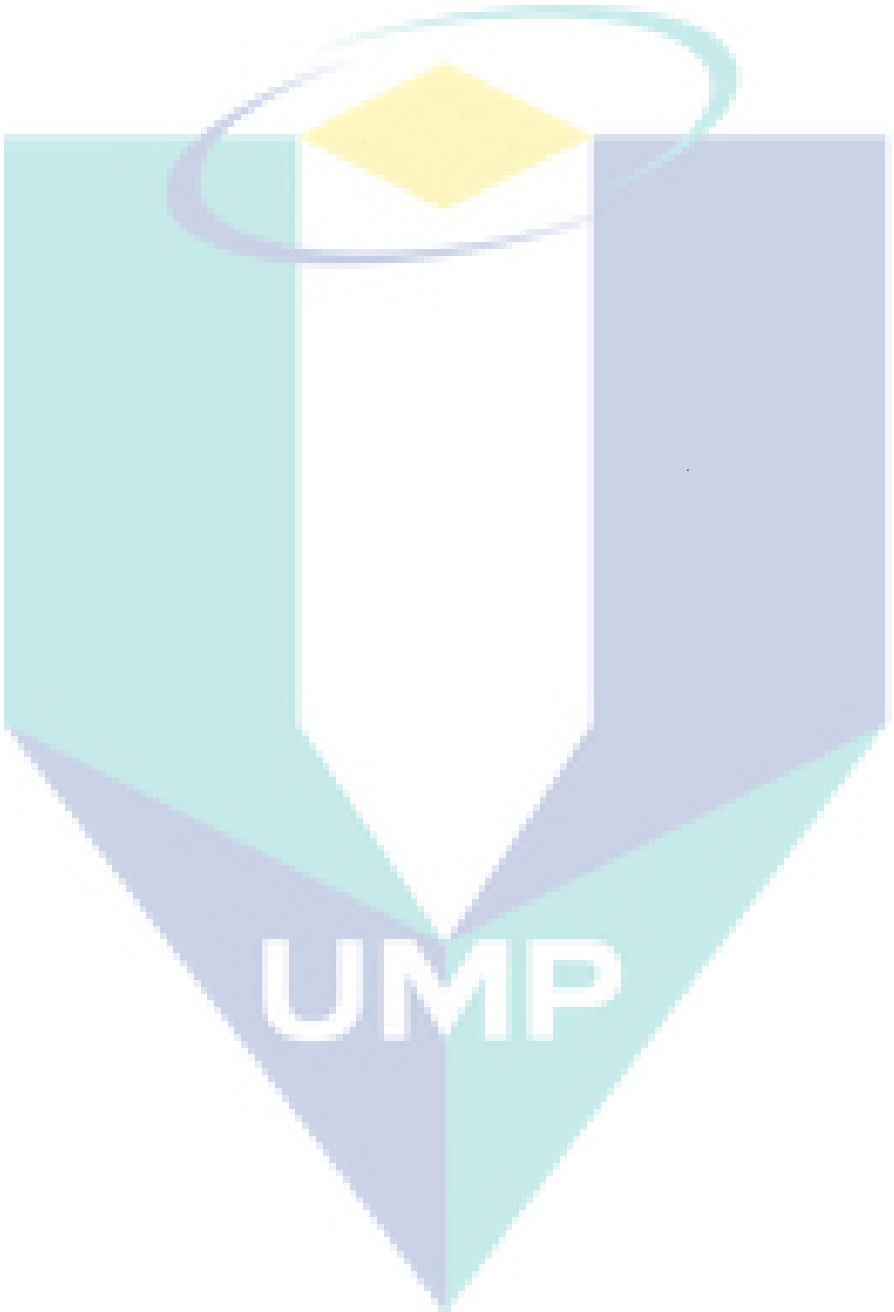
From the related research studies on oral presentation anxiety conducted in Malaysia, it should be noted that very few research studies on oral presentation were carried out in engineering education context. Most of the studies investigated oral presentation anxiety as a sub element of oral communication apprehension as the main variable. As such, the discussion of oral presentation anxiety or public speaking anxiety was presented in brief.

In this respect, this study brings out technical oral presentation anxiety, in the context of engineering education as the main variable with respect to students' performance in technical oral presentation assessment. An in depth investigation on the factors for anxiety students experienced from the stakeholders is also conducted. As effective oral presentation skill is one of the oral communication competencies demanded by industries for engineers to possess, understanding the student engineers' actual learning experience in delivering important technical oral presentations is highly significant and valuable.

2.7 Conclusion

This chapter has reviewed the literature pertaining to the important variables in this study. First, the chapter discussed the importance of oral communication in the context of engineering education. Next, anxiety as one of the variables in the

present study was reviewed. Following this, theories and concepts related to the conceptual framework of the study were explained. This chapter ended with a review of related research studies conducted on oral presentation anxiety by other researchers.



CHAPTER THREE

METHODOLOGY

3.0 Introduction

This study investigated the technical oral presentation anxiety in English among engineering students. It focused on the students' levels of anxiety and their relationship with students' performance in their Undergraduate Research Report (URP) II final oral presentations. Furthermore, the researcher also conducted an in-depth investigation on the factors that may have impacted students' levels of anxiety and hence affected the students' performance in their URPII final oral presentations. This chapter will describe the methodology applied in this study, the context and respondents involved and the instruments used in data collection and data analysis procedures. The issue of validity, reliability and ethical issues of the study will also be addressed.

3.1 Research design

This study employed case study methodology because it investigated a particular real-life phenomenon in depth (Yin, 2009). A case study is defined as an investigation of a contemporary social phenomenon within its real-life context, using multiple data sources (Gerring, 2006). It is an intensive study of a single case where the purpose of that study is to shed light on a larger class of cases (a population) (Gerring, 2006). Furthermore, it offers:

> "holistic analysis and with the 'thick description of events', the depth analysis that it offers (depth refers to the details, richness, completeness, wholeness and the degree of variance in an outcome that is accounted for by an explanation)"
>
> (Gerring, 2006, p. 49).

Yin (2009) posited that a case study is not just a form of qualitative research but it can also be a combination of quantitative and qualitative data. As a mixed methods study, this study combines both quantitative and qualitative approaches into its research methodology (Tashakkori & Teddlie, 2008). Data that were collected and analyzed from both of the main strands in this study were very significant in providing a better understanding of the problem investigated. In investigating the anxiety situation, sequential mixed design (Teddlie & Tashakkori, 2009), which is also known as sequential explanatory approach (Creswell, 2003), was chosen. This design occurs when two strands (qualitative and quantitative) take place separately but chronologically (Teddlie & Tashakkori, 2009; Creswell, 2003).

The first stage of this study started with quantitative data collection and data analysis. It was then followed by the second stage, which involved qualitative data collection and data analysis. The final stage was the interpretation of the entire analysis. The purpose of this sequential mixed method study was to obtain statistical, quantitative results from a sample, as well as qualitative data - through a follow-up process with a few individuals - to probe or explore these results in greater depth (Creswell, 2003). Teddlie and Tashakkori (2009) further explain that qualitative data (the second strand) is used to confirm or disconfirm inferences from the quantitative data (the first strand) and it may also be used to further validate the findings. In other words, the data from both strands were merged, integrated, linked or mixed in this mixed methods study.

Figure 3.1 below illustrates the sequential explanatory approach which was taken from Creswell (2003, p. 213):

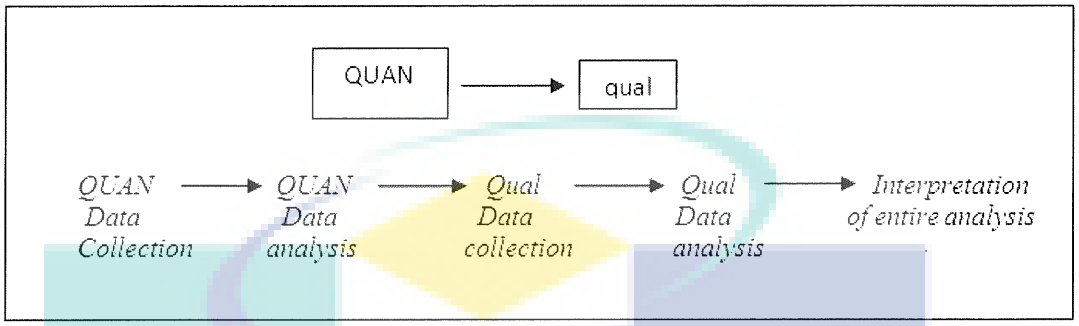


Figure 3.1: Sequential Explanatory Approach (Creswell, 2003, p. 213)

The triangulation technique verifies facts from multiple sources (Sekaran & Bougie, 2010, Bogdan & Biklen, 2007) because "one method alone cannot provide adequate support. It may take two or more independent sources to support the study and its conclusion" (Mackey & Gass, 2005, p. 181). Multiple sources in triangulation refer to multiple data sources, research methods, investigators and inferences (Teddlie & Tashakkori, 2009). Merriam (2009) posited that triangulation is also a well-known strategy to support the internal validity of a study. There are four kinds of triangulation: 1) methodological triangulation, 2) data triangulation, 3) researcher triangulation and 4) theory triangulation (Sekaran & Bougie, 2010). In this case study, methodological triangulation was applied where multiple methods of data collection were used. Methodological triangulation has been used to refer to a mixed method study that combines both quantitative and qualitative methods (Teddlie & Tashakkori, 2009). In this study, the data obtained from the questionnaires and the findings gathered from the interviews conducted with the students and the panel of evaluators regarding students' anxiety in technical oral presentations were triangulated to provide comprehensive understanding of the anxiety phenomenon.

3.2 Context and respondents of the study

3.2.1. Description of the context

This study was carried out over a 7-week period at UMP, which is a university specializing in engineering disciplines. Being an engineering and technology-based university, UMP is confined to the requirements outlined by engineering accreditation and professional bodies such as the Accreditation Board of Engineering and Technology (ABET) and the Malaysian Engineering Accreditation Council (EAC). These bodies are increasingly placing a high degree of importance on hard and soft competencies such as outcome measures, which engineering graduates must possess upon graduation. Effective communication skills are among the competencies that engineering graduates are expected to possess. Due to that, UMP puts a high emphasis on communication skills among its graduates. Out of 120 credits, eight credits are given to Language and Communication courses. These eight credits are divided into four levels of English communication courses. Table 3.1 below illustrates the ESP courses offered according to their levels and allocation of credits:

Table 3.1: Courses Offered according to Levels and Credits Allocation

Level	Course	Code	Credits
Level I	Technical English	UHL2312	2 credits
Level II	Technical Writing	UHL2322	2 credits
Level III	Academic Report Writing	UHL2332	2 credits
	Core-required course		
Level IV	Introduction to Public Speaking	UHL4012	2 credits
	Effective Reading	UHL4022	2 credits
	Expository Writing	UHL4032	2 credits
	Project-based proposal Writing	UHL4042	2 credits
Total			8 credits

For these ESP-based courses, all the four language skills are embedded in the teaching materials, assignments and assessments. The greater focus is on speaking and writing skills. For example, in Technical English (UHL2312), students are exposed to oral presentation skills, technical description and process explanation writing. While Technical Writing (UHL2322) provides students with skills in comparing and contrasting products as well as writing technical reports, Academic Report Writing (UHL2332) teaches and guides students to write an academic report by conducting basic analytical research. In Level IV, all students who have passed the Level III course are given the opportunity to choose a core-required course that interests them. The core-required courses in Level IV that are available to the students are Introduction to Public Speaking, Effective Reading, Expository Writing and Project-based Proposal Writing. Students are given the opportunity to choose and enroll in one of the courses offered in order to hone their ability in any of the language skills. For instance, the Introduction to Public Speaking course sharpens students' presentation and public speaking skills, while the Effective Reading course

provides effective reading skills for students. The other two courses emphasize writing skills and each focuses on a different kind of written genre, such as expository essays and engineering proposal writing.

In all ESP courses offered by the Language and Communication Department, students have to deliver oral presentations individually and/or in groups. For instance, in the first semester, in Technical English (UHL2312), students are exposed to oral presentation skills, after which they are required to do individual presentations. To ease them into the experience of public speaking, the subject topics range from "Who am I" to having students talk about their personal experiences. As they learn technical description in the second part of the semester, the students are required to apply their oral presentation skills to deliver technical oral presentations in groups, based on any product related to their field. In the second semester, students compare and contrast early and recent products. This gives them ideas for their final project work, which is to invent or innovate a product. They are then assessed based on their written report and group presentation. In the third semester, students are given the opportunity to conduct an analytical research project in groups. Even though the projects are on social research, students are exposed to the whole process, which involves conducting a research study, such as writing a proposal, collecting data, analyzing data and writing a written report. At the end of the third semester, students are required to present their findings orally to the class and submit their written reports. This process is similar to the process that is involved in conducting their Undergraduate Research Project (URP). The only difference is that the URP is an engineering project that involves experiments in a laboratory and is conducted individually. Examples of the projects conducted by the Pure Chemical students were "Removal of heavy metals from industrial wastewater (plastic

industry) by using ultrasonic-assisted extraction process" and "Characterisation of physicochemical properties of novel one-step chemical method for preparation of aluminium nano fluids". The sample projects conducted by biotechnology students include "Biodegradable biocomposite film from starch blended with chitosan and gelatin plasticized with glycerol" and "Butanol production from palm oil mill effluent by anaerobic fermentation using Clostridium Saccharoperbutylacetonicum". The gas technology students came up with projects such as "Production and characterization of bio-oil and gas from rice husk using fast pyrolysis process" and "Investigating the effect of solid powder particle type on the turbulent multi-phase flow in pipelines". Appendix 11 provides a list of URP titles conducted by the final year chemical engineering students.

After students have completed their language courses in the first four semesters, they do not receive any more language instruction. When students work on their URP in Semesters 6 and 7, they are supervised by their engineering lecturers (supervisors) on technical knowledge and writing format, as well as other required skills such as language and presentation skills.

3.2.1.1. The Undergraduate Research Project (URP)

The Undergraduate research project (URP) is a compulsory course for all students as part of their graduation requirement. In the URP, which is taught in two semesters (Semesters 6 and 7), students are expected to carry out and complete a research project individually and they are supervised by one or two engineering lecturers who act as their supervisors.

In the first semester (Semester 6), students are required to complete a proposal which consists of the first three chapters. It includes the objectives of the

research, statement of the problem, a review of related literature, methodology and expected results. Before writing the chapters, the supervisors are responsible for assigning the topic based on their field of expertise. Some supervisors allow students to choose their own topic but they ensure that the topic is within their area of specialization. After the topic is approved, students will start writing the proposal. During the proposal writing stage, supervisors will give advice and monitor students' progress. At the end of URP I, students must present their proposal before a panel consisting of their faculty lecturers for project approval.

In URP II (Semester 7), students need to complete Chapters Three, Four and Five, which consist of data analysis and results, as well as discussion and conclusion. At the beginning of Semester Two, students will start with their experiments in laboratories. Throughout the semester, students will be guided by their supervisors in completing the project. While conducting their experiments, the students continue writing the chapters. In writing and completing the chapters, UMP URP guidelines are followed. After students have written their draft chapters, they will submit them to their supervisors. The supervisors will decide whether these students are well prepared for the URPII final oral presentation assessment.

3.2.1.1.1 The URPII Final Oral Presentation

The URPII final oral presentation session (which was a full day session) was run on Thursday, 25th November 2010. The session started at 8.30 am and ended at 5.00 pm. It was divided into three sessions. The first session started at 8.30 am and ended at 10.30 in the morning. The second session resumed at 11.00 am and ended at 1.00 pm in the afternoon. The third session started again at 2.00 pm and ended at 5.00 pm in the evening.

In each room, there was a total of 14 students who were assigned to present. Four students presented during the first and second sessions respectively and six students were scheduled to present in the afternoon session. Each student was given a total of 30 minutes, inclusive of the presentation (15 minutes) and the question and answer session (15 minutes). All 14 students were told that it was compulsory for them to attend the three sessions. To track the students' attendance, they were required to sign the attendance sheet for every session.

The parallel session utilized 15 rooms, including 10 CMLHS Multimedia Language Labs (MLL) and 5 faculty meeting rooms around UMP. All CMLHS Multimedia Language Labs (MLL) are located on the first floor of Block X and Block Y. With various classroom settings (physical layouts), these labs are equipped with facilities including 30+1 pax multimedia ready computers, a whiteboard, flipcharts and an LCD projector. The meeting rooms, however, are located in faculties around UMP. Even though the meeting rooms vary in layout, size, occupancy and furniture, they are fully equipped with facilities such as a computer, a whiteboard, flipcharts and an LCD projector, which are important and necessary to assist students' presentations.

In each room, three to four evaluators were assigned to evaluate 14 student presentations. During the session, the panel of evaluators was seated in the room based on their areas of expertise, such as biotechnology, gas technology and pure chemicals.

Table 3.2 below illustrates the distribution of faculty lecturers, industrial personnel and students in each room. There was a total of 36 faculty lecturers and 10 industrial personnel involved as evaluators in the URPII final oral presentation assessment and a total of 208 students presented their URP projects.

Table 3.2: Distribution of Panel of Evaluators and Students per Room

VENUE	FACULTY LECTURERS	INDUSTRY PERSONNEL	STUDENTS
Room 1	3	1	14
Room 2	2	1	14
Room 3	2	1	13
Room 4	3	0	14
Room 5	2	1	14
Room 6	2	1	13
Room 7	2	1	14
Room 8	2	0	14
Room 9	2	1	14
Room 10	2	1	14
Room 11	3	1	14
Room 12	4	0	14
Room 13	3	0	14
Room 14	2	1	14
Room 15	2	0	14
TOTAL	36	10	208

Most of the evaluation rooms contained three to four evaluators. While ten rooms contained industry personnel and two or three faculty lecturers, the other five rooms contained only the faculty lecturers. In each room, a moderator (a faculty lecturer who was one of the evaluators) was assigned to be responsible for reading the rules and regulations at the beginning of each session and for keeping the sessions on time, both at the beginning and at the end. The moderator would call upon the student's name and before each student started with his/her presentation, the student had to hand over the evaluation forms to the moderator. The evaluation forms were given to all students a week before the presentation date so that the students become familiar with the evaluation criteria. They were required to write down the names of the evaluators on each form. Once the forms were received, the moderator

distributed the evaluation forms to the other evaluators before the presentation began. Figure 3.2 shows the general layout of the room:

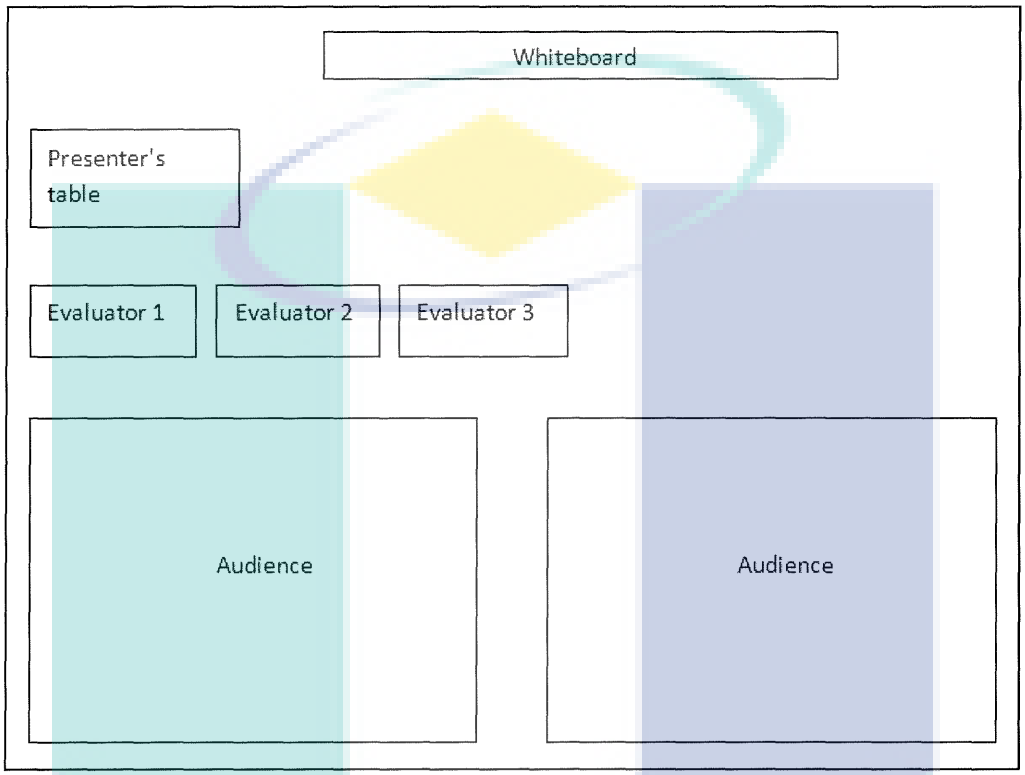


Figure 3.2: Layout of the Evaluation Room

To evaluate the URP oral presentations, detailed marking schemes were distributed to all panels. Table 3.3 below shows the breakdown marks for URP I and URP II as prepared by the faculty (Faculty of Chemical and Natural Resources Engineering, Universiti Malaysia Pahang, 2010):

Table 3.3: The Breakdown of Marks for URPI and URPII.

URPI		URPII	
Item	*Distribution*	*Item*	*Distribution*
Proposal report	70%	Dissertation (Supervisor)	55%
General Handling	10%	General handling1(Laboratory)	10%
Proposal presentation	20%	General handling 2(Supervisor)	10%
		Technical paper	5%
		Final presentation	20%
Total	100%	Total	100%

The significance of oral presentations in engineering education can be seen from this breakdown of marks in the URP course. Throughout the course, students must present their project orally on two occasions. For both the proposal and final presentations, the same weightage (25%) is given. The final presentation is the most important presentation as it is mandatory for students to present in order for them to pass their URP course. Furthermore, it is also the faculty's mandatory requirement for students' graduation.

The items included in both the proposal and final presentation assessments are divided into two main criteria: content and presentation skills. Table 3.4 below shows that more weightage is given to content criteria (75%) compared to presentation skills criteria (25%). The oral presentations could just be a platform for students to report their project results orally; however, its importance is still recognized in engineering education as it is also assessed and given due weightage. The breakdown of marks for the presentations is illustrated in Table 3.4 below:

Table 3.4: Breakdown of Marks for the Proposal and Final Presentations

PROPOSAL PRESENTATION (URP I)		FINAL PRESENTATION (URP II)		
Item	*Distribution*	*Item*	*Distribution*	*Total*
Content	75%	**Content**		**75%**
Research background and literature review		Objective, problem statement and scope of research	15%	
Research contribution		Research background and literature review	15%	
Research methodology		Research methodology	15%	
Expected results		Results and discussions	15%	
Gantt chart and research planning		Conclusions and recommendation		
Conclusions				
Presentation skills	25%	**Final presentation**		**25%**
Style and communication skills		Style and communication skills	**5%**	
Ability to answer questions		Ability to answer questions	**5%**	
Personal appearance		Personal appearance	**5%**	
Length of presentation		Length of presentation	**5%**	
Visual presentation		Visual presentation	**5%**	
Total	100%	**Total**		**100%**

During the proposal presentation assessment, the evaluating panel comprised faculty lecturers only, but for the final presentation assessment, the panel of evaluators consisted of faculty lecturers as well as personnel from industry. These industry representatives are working engineers or engineers-cum-researchers from related industries. The collaboration between industry and university in the URP final presentation assessment was initiated by the faculty in the 2010/2011 academic

session. For both presentations, the URP Coordinator will prepare the schedule and book several rooms for the parallel presentations to be held.

3.2.2 Description of the respondents

3.2.2.1 Final-Year Chemical Engineering Undergraduate Students

In selecting the sample for this study, many factors were taken into consideration, such as the niche area of the university, the assessment and evaluation structure of the URP course and the use of English as the medium for URP presentations. Furthermore, the point that Malaysia has high interest in the chemical industry and also in the fast advancement of biotechnology areas has created the interest in the researcher to study the workforce prepared to support these industries. Therefore, the Faculty of Chemical and Natural Resources Engineering (FCNRE) fits the criteria well and was chosen to be involved in this study.

There was a total of 216 final year chemical engineering students from the 2007/2008 cohort. They came from various programmes, for instance Chemical Engineering, Biotechnology and Gas Technology. The sample of the students selected in this study must fit certain criteria, which are that they must have:

1) successfully completed both URP I and URP II courses,

2) presented URP orally in the final presentation session,

3) answered and returned completed questionnaires.

Out of a total of 216 students who completed their URPI and registered for URPII courses, 208 students successfully completed their projects and presented their projects orally during the final oral URP project presentation session. Nevertheless, only 160 students answered and returned completed questionnaires to the researcher. After analyzing the questionnaires, 17 questionnaires were found to be incomplete.

Among the most common missing information were students' matric numbers. Table 3.5 below summarizes the process of selecting students as the sample for this study:

Table 3.5: Summary of Sample For This Study

Activities	Number of students
Registered in URP II course	216
Presented URP II orally	208
Did not present URP II orally	8
Answered and returned the questionnaires	160
Did not have marks for URP II	8
Did not answer the questionnaires completely	17
Final sample	**135**

Before data from the questionnaire were analysed, the researcher ensured that the students who completed the questionnaires received their scores for URPII final oral presentations. After the shortlisting process was conducted, the total sample for this study was 135 students.

All the respondents were 21 years old and were fourth year students. There were 57 female and 78 male students respectively. Table 3.6 below illustrates the number of students who participated in the study according to the various programmes:

Table 3.6: Number of Students according to Programmes

Programmes	Number of students
Chemical Engineering	69
Biotechnology	33
Gas Technology	33
Total (*n*)	**135**

For the qualitative part of the study, a total of 44 students (from 135 students) participated in the focus group interviews. In the second stage of this study, a meeting with the final year students was organized for the second time in early January 2011. These students were clearly informed about the objectives of the focus group interviews, the structure of the interviews and their vital participation in the interviews. Criteria for respondents in the focus group interviews included answering both the adapted version of PRPSA-34 and the PRCA-24 completely and presenting their URP project orally. The criterion on having presented their URP project orally was of utmost importance because the interviews aimed to elicit the students' personal experience with regard to the URPII final oral presentations. Participation in these focus group interviews was completely voluntary and respondents were clearly informed about both the consent forms that they had to sign and the confidentiality of the information shared. Of 135 students who were eligible to participate in the focus group interviews, 31 students volunteered and gave their names to the researcher at the end of the meeting. However, the number was not sufficient. After a memo was sent to the other students, another 13 students volunteered, hence the total sample for the focus group interview was 44. Table 3.7 below presents the gender and the major subject of study of the respondents who volunteered to be involved in the focus group interviews:

Table 3.7: Focus Group Interview Respondents Based on Gender and Majors

Major	**Males**	**Females**	**Total *(n)***
Biotechnology	1	13	14
Chemical	2	13	15
Gas technology	6	9	15
Total *(n)*	9	36	44

3.2.2.2 Panel of Evaluators

There was a total of 46 people on the panel of evaluators for the URPII final oral presentation session. It comprised 36 faculty lecturers and 10 personnel from chemical-related industries in Malaysia.

According to Guest et al. (2006, p. 78), "a sample of six interviews may [be] sufficient to enable development of meaningful themes and useful interpretations" in order to reach data saturation. Furthermore, Creswell (1998) also recommended 5-25 interviewees for a phenomenological study. In addition, it would be impractical to interview everyone involved in the URPII final oral presentation assessment, thus internal sampling was conducted (Bogden & Biklen, 2007). Purposeful sampling technique (non-probability sampling) was used as the researcher "wants to discover, understand and gain insight and, therefore, must select a sample from which the most can be learned" (Merriam, 2009, p. 77). Based on the literature, a sample size of 13 evaluators, i.e. six faculty lecturers and seven industry personnel, were selected to be interviewed as key informants. The interviewees were the primary unit of analysis.

3.2.2.2.1 Faculty Lecturers

Six faculty lecturers from the Faculty of Chemical and Natural Resources Engineering (FCNRE) were selected to be involved in this study as key informants. The selection was made based on the recommendation by the Heads of the Programmes in the faculty. All six faculty lecturers possess similar characteristics in that all of them had supervised students' Undergraduate Research Projects and served UMP for more than seven years. Table 3.8 illustrates the number of faculty lecturers involved in this study according to programmes:

Table 3.8: Faculty Lecturers according to Programmes

Programmes	Number of lecturers
Chemical Engineering	2
Biotechnology	2
Gas Technology	2
Total *(n)*	6

Each faculty lecturer was given five to six students to be supervised and the topics given to the students were within the lecturer's areas of expertise. For two semesters, the lecturers were responsible for guiding, giving advice and monitoring their supervisees' progress in completing their URP. At the end of each semester, the lecturers evaluated and graded students' work.

3.2.2.2.2. Industry Personnel

At the beginning of the 2010/2011 academic session, FCNRE extended the industry's role and involvement in the UMP teaching and learning process in an effort to promote better collaboration. The URP Coordinator was responsible for contacting industries and asking for representatives to be involved in students' URPII final oral presentations as evaluators. Ten chemical-related companies were willing to cooperate with the faculty by sending one member of personnel from their company. All these personnel were professionals with a background in chemical engineering. Out of ten industry personnel from various chemical-related companies around Malaysia who were involved as members of the panel for URPII final presentations, seven agreed to be involved in this study. Four of them were attached to joint-venture multinational companies, two were with government agencies and one was with a private multinational company. Table 3.9 below illustrates the industry representative's position and their type of company:

Table 3.9: Industry Personnel Positions and Type of Company

No.	Position	Type of company
1	Manager	Private multinational
2	Process Engineer	Joint-venture multinational
3	Process Engineer	Joint-venture multinational
4	Process Engineer	Joint-venture multinational
5	Head of Bio Energy Programme	Government agency
6	PLDD Executive	Joint-venture multinational
7	Project Executive	Government agency

3.3 Research instruments

To achieve the research objectives of this study, triangulation strategy is applied. Triangulation is "the process of triangulating different data sources of information by examining evidence from the sources and using it to build coherent justifications for themes" (Creswell, 2003, p. 196). This technique can also aid "credibility, transferability, confirmability and dependability" (Mackey & Gass, 2005, p. 181). The data and the findings from the research instruments will be triangulated to further validate the evaluation and the research findings. The research instruments used in this study comprised questionnaires, focus group interviews, face-to-face interviews, email interviews and some official documents.

3.3.1 Questionnaires

There are many advantages of survey design, such as its economical design and, most importantly, its rapid turnaround in data collection. In addition, the survey design can also be used to make generalizations and inferences about the characteristics, attitudes or behaviours of a sample to a population (Creswell, 2003). This study employed two established questionnaires, which were the Personal Report

of Public Speaking Anxiety (PRPSA-34) and the Personal Report of Communication Apprehension (PRCA-24).

3.3.1.1. Personal Report of Public Speaking Anxiety (PRPSA-34)

The *Personal Report of Public Speaking Anxiety* (PRPSA-34) questionnaire, was developed by James C. McCroskey in 1970 and was then enhanced by Richmond and McCroskey (1998). This unidimensional questionnaire was adapted to be used in this study due to the fact that it was designed to directly assess anxiety in a public speaking context and it provides "an excellent variety of anxiety stimuli" (McCroskey, 1970, p. 271). In addition, with 34 statements and a 5-point Likert scale, this questionnaire yields more accurate and precise measurement on public speaking anxiety (McCroskey, 1984) in comparison to the Report of Confidence as a Public Speaker (PRCS) questionnaire developed by Paul (1966) which employs a true-false option. Furthermore, Francis and Miller (2008) also suggested future research to use the PRPSA-34 questionnaire to rank students' apprehension in public speaking.

This PRPSA-34 questionnaire consists of 34 statements, comprising negatively worded items (e.g. "My thoughts become confused and jumbled when I am giving a speech" and "I experience considerable anxiety while sitting in the room just before my speech starts") and positively worded items (e.g. "I face the prospect of giving a speech with confidence" and " I feel comfortable and relaxed in the hour or so just before giving a speech"). The respondents indicated their level of endorsement of each item on a 5-point scale ranging from 1 (Strongly Agree) to 5 (Strongly Disagree).

Based on studies conducted by Yau-Hau (2011), Kostić-Bobanović and Bobanović (2007) and Elliot and Chong (2004), the alpha reliability for the questionnaire in these studies was reported to be 0.82, 0.86 and 0.90 respectively. Even though the focus of this study was on technical oral presentation, the presentation was still conducted in public; thus, this questionnaire is found suitable in the way it accurately measures the respondents' feelings when presenting technical oral presentations.

To adapt the questionnaire for this study, the word 'speech' was replaced by 'technical oral presentation' to accurately represent the URP technical oral presentations. These changes were made to a total of 30 statements in the original PRPSA-34 questionnaire. Table 3.10 below illustrates the sample items in the original version and the adapted version:

Table 3.10: The Original Version of Selected PRPSA-34 Items and Their Adapted Version

Original version	**Adapted version**
While preparing for giving a *speech*, I feel tense and nervous.	While preparing for giving a *technical oral presentation*, I feel tense and nervous.
I feel tense when I see the word *speech and public speech* in a course outline when studying.	I feel tense when I see the word *technical oral presentation* in a course outline when studying.
My thoughts become confused and jumbled when I am giving a *speech*.	My thoughts become confused and jumbled when I am giving a *technical oral presentation*.
Right after giving a *speech*, I feel that I have had a pleasant experience.	Right after giving a *technical oral presentation*, I feel that I have had a pleasant experience.
I get anxious when I think about a *speech* coming up.	I get anxious when I think about a *technical oral presentation* coming up.

Table 3.11 below illustrates the score for the PRPSA-34 questionnaire and its indication of students' levels of technical oral presentation anxiety. The score for this instrument ranges from 34 to 170. Scores of 34 – 84 represent students who have a very low level of technical oral presentation anxiety; scores of 85 – 92 represent students with a moderately low level of anxiety about technical oral presentation, scores of 93 – 110 represent students who have moderate anxiety in technical oral presentation, scores of 111 – 119 represent moderately high anxiety in technical oral presentation and scores of 120 – 170 represent a very high level of anxiety in technical oral presentation.

Table 3.11: Summary of PRPSA-34 Score and Its Level of Technical Oral Presentation Anxiety

Scores	Level of technical oral presentation anxiety
34 – 84	Low
85 – 92	Moderately Low
93 – 110	Moderate
111 – 119	Moderately High
120 – 170	Very High

3.3.1.2. Personal Report of Communication Apprehension (PRCA-24)

Another questionnaire used in this study was the *Personal Report of Communication Apprehension* (PRCA-24) which was also developed by McCroskey (1982a). Since its first development, the PRCA has gone through several refinement processes, which resulted in the current form, known as PRCA-24. It was noted that the PRCA-24 is the most current version for measuring trait-like apprehension and it was found consistent across communication contexts (McCroskey, 1997). Consisting

of 24 statements, it was designed to measure oral communication apprehension (OCA) experienced by individuals. The fact that the CA phenomenon is viewed as an individual experience (Alley-Young, 2005) indicates that this questionnaire is very relevant to and suitable for the present study because this study examines individual experiences in communicating orally in English language. The PRCA-24 is selected because of its wide use and is considered reliable and valid in nature (Byrne, Flood, & Shanahan, 2009; Finn, Sawyer, & Schrodt, 2009; Roby, 2009; Richmond, McCroskey, McCroskey, & Fayer, 2008; Dupagne, Stacks, & Giroux, 2007). Its internal reliability has also been reported to be consistently above 0.90 (Vevea, Pearson, Child, & Semlak, 2009; Francis & Miller, 2008; Gardner, Milne, Stringer, & Whiting, 2005). This questionnaire measures individuals' oral CA in four different communication contexts: Group Situations, Meetings, One-to-one Communication (Dyad) and Public Speaking. There are six statements for each communication context. In this questionnaire, the students were required to rate their agreement to each statement by choosing options ranging from 1 (Strongly Agree) to 5 (Strongly Disagree). The sample questions for each context are as follows:

Group Situations

1. I dislike participating in group discussions.
2. Engaging in a group discussion with new people makes me tense and nervous.
3. I am tense and nervous while participating in group discussions.

Meetings

1. Generally, I am nervous when I have to participate in a meeting.
2. I am afraid to express myself at meetings.
3. Communicating at meetings usually makes me uncomfortable.

One-to-one communication (Dyad)

1. While participating in a conversation with a new acquaintance, I feel very nervous.
2. I have no fear of speaking up in conversations.
3. Ordinarily I am very tense and nervous in conversations.

Public speaking

1. Certain parts of my body feel very tense and rigid while giving a presentation.
2. My thoughts become confused and jumbled when I am giving a speech.
3. While giving a speech, I get so nervous I forget facts I really know

Scores can be derived for each communication context and overall measure for OCA. Table 3.12 below illustrates the scores and their interpretation, showing the levels of OCA in each communication context. Scores of 6 - 12 are considered to have low oral communication apprehension in the communication context. Scores of 12 - 18 indicate a moderate level of oral communication apprehension and scores of 18 - 30 signify a high level of oral communication apprehension.

Table 3.12: Oral Communication Apprehension Scores for Each Communication Context

Scores	Levels of OCA
6-12	Low
12-18	Moderate
18-30	High

Table 3.13 below shows the overall measure for PRCA-24. Scores can range between 24 and 120. Scores of 24 – 55 represent students who have low levels of

oral communication apprehension (OCA); scores of 55 – 83 represent students with moderate OCA and scores of 83 – 120 represent students who have high levels of OCA.

Table 3.13: Overall Measure for PRCA-24

Scores	Levels of OCA
24-55	Low
55-83	Moderate
83-120	High

3.3.2 Interviews

Interviewing is one of the most popular techniques used in qualitative research studies. Merriam (2009) and Denscombe (2007) posit that interviews are deemed appropriate as a data collection method for a research study that involves the exploring and understanding of certain complex and subtle phenomena. Furthermore, unlike written questionnaire, interviews can be conducted with any respondents regardless of their background and will not suffer from low return rates (Nunan & Bailey, 2009).

In line with Merriam's (2009) and Denscombe's (2007) proposition, the present study employed interviews because this study aims to explore students' feelings, emotions, experiences, opinions and understand their behaviour in presenting their URPII final oral presentations. In addition, interviews also permitted the panel of evaluators (the key informants) to express their opinions and personal perspectives on the students' anxiety levels and their performance in the URPII final oral presentation assessment. The privileged information shared by these key players in the field (the students and the panel of evaluators) are indeed very significant as these are the people who are in special positions "to know", as intimated by

Denscombe (2007, p. 184). Nevertheless, in interviewing key persons, Yin (2009) stresses that a researcher must make proper and specific arrangements according to interviewees' available time and convenient meeting place. In this study, the researcher discussed with and arranged the time and venue with the interviewees so as to ensure that they felt at ease during the interview sessions and, hence, opened up and expressed themselves better regarding the issue discussed.

Semi-structured interviews, which are preferred by many field researchers, are used in this study because they offer more flexibility (Sekaran & Bougie, 2010; Mackey & Gass, 2005). In semi-structured interviews, a researcher is not constrained to pre-set questions and has the opportunity to adapt, adopt and change the questions as he or she continues with the interviews. In this way, the interviewees have more room to develop ideas and speak more widely on the issues raised. The interactions that happened during the interviews were incredibly rich and hence produced rich information (Nunan & Bailey, 2009).

3.3.2.1 Individual Interviews

In the present study, individual interviews were conducted with six selected chemical engineering lecturers and two industry personnel. However, Guest et al. (2006) posit that six interviewees in a study is sufficient for the data to be saturated. The main aim of conducting individual interviews with the panel of evaluators was to triangulate data for answering research questions 2 and 4. The selected key informants have adequate experience and useful information to be shared regarding students' anxiety in presenting their URP projects orally. The semi-structured interviews were conducted individually and the interviews were tape-recorded with the interviewees' permission.

In order to gauge the perceptions of the panel of evaluators, eight interview questions were developed and constructed based on research studies carried out by King (2002) and Otoshi and Heffernan (2008). The questions developed evolved around students' performance during the URP presentations and their observation of the presence of anxiety in students before and during the presentations. Appendix 9 lists the questions for semi-structured interviews conducted with the panel of evaluators.

3.3.2.2 Focus Group Interviews

Focus group sessions are able to elicit authentic points of view, trustworthy data and feelings of the respondents regarding issues discussed (Sekaran & Bougie, 2010). Composed of several members in a group, a focus group session is often led by a mediator or a facilitator who is responsible for directing the discussion and keeping it focused on the issue being discussed (Mackey & Gass, 2005). Merriam (2009) and Dornyei (2007) suggest that each focus group should consist of between six and ten people because less than six respondents will "limit the potential of 'collective wisdom' whereas too large a size makes it difficult for everyone to participate" (Dornyei, 2007, p. 144). Furthermore, Dornyei (2007) also suggests the creation of a project, to involve four to five groups as a minimum, to ensure adequate breadth and depth of information of a particular issue.

In this study, focus group interviews were carried out in six focus groups, with a minimum of seven students in each group. In each group, the respondents were homogeneous with regards to their major of studies and faculty. In addition, the respondents were acquainted with each other since they had been studying together for the last three and a half years, and all of them had the knowledge of the topic discussed by having personal experience in presenting their URP project.

Homogeneity in a focus group is believed to promote the dynamics of the group (Dornyei, 2007). At the same time, they were also heterogeneous in terms of their genders and their PRPSA-34 scores. According to Dornyei (2007, p. 144), heterogeneous samples could "provide varied and rich data that covers all angles". Table 3.14 illustrates the composition of the student focus groups:

Table 3.14: Composition of Student Focus Groups

	Focus Group 1	**Focus Group 2**	**Focus Group 3**	**Focus Group 4**	**Focus Group 5**	**Focus Group 6**	**Total *(n)***
Major	Gas	Biotech	Gas	Chemical	Chemical	Biotech	6
***Gender**	3 M	1M	3 M	2 M	0 M	0 M	9
	5 F	6 F	4 F	6 F	7 F	7 F	35
****PRPSA-34 level**	1 H	2 H	2H	2H	2H	3H	13
	7M	4M	5M	3M	4M	3M	25
	0L	1L	0L	3L	1L	1L	6
Total *(n)*	8	7	7	8	7	7	44

**Gender = M represents Male, F represents Female;*
***PRPSA-34 level = H represents High Anxiety, M represents Moderate Anxiety, L represents Low Anxiety*

The data from the focus group interviews would answer research question number four, which gauges the sources of anxiety among the students. During the interviews, the researcher encouraged the students to use the English language. However, the students were given the option to use Bahasa Melayu (the national language and first language (L1) to most students). This was to create a conducive environment for the students and to let the students be more at ease so that they could express their ideas freely. As Mackey and Gass (2005) argue, interviews can be conducted in the students' L1 to "remove concerns about the proficiency of the learner impacting the quality and quantity of the data provided" (p. 174). During the

interviews, most students preferred to use Bahasa Melayu; however, there were two students who spoke in English.

Questions in the interviews included students' personal experience during the URPII final oral presentations: for instance, challenges before, during and after the presentations, as well as their perceptions of sources of their anxiety.

3.3.2.3 Email Interviews

Email interviews have been part of qualitative research methods due to technology advancement (Thach, 1995). Besides providing quick turnaround, this form of virtual communication also offers freedom in terms of space and time, which enables the respondents to have more time to think and reflect deeper about the questions (James, 2007) . Asynchronous in-depth interviews conducted via email is "semi-structured in nature and involves multiple email exchanges between the interviewer and interviewee over an extended period of time" (Meho, 2006, p. 1284).

In this study, email interviews were conducted with five industry personnel who agreed to be involved in this study, but did not have time to have face-to-face interviews with the researcher. The industry personnel gave several reasons for not being able to be interviewed face-to-face, such as time constraints, having a tight schedule and the fact that it was more convenient to communicate through email. Due to these reasons, the researcher emailed the interview questions to the interviewees. The questions that were asked of the industry personnel were similar to the questions posed to the faculty lecturers, as both groups were categorised as the panel of evaluators. The data from these interviews helped to answer research question number five.

3.3.3 Documents

Documents include written, visual and physical documents or materials and artifacts that may be valuable and relevant to the study (Merriam, 2009). Documents are important because they help to clarify factors such as verifying the correct spellings, corroborating evidence and information from other sources and making assumptions which lead to further investigation of the problem (Yin, 2009). In this study, the researcher was able to obtain several official documents from the FCNRE URP Coordinator. The documents included:

1) faculty guidelines for URP I and II

2) marking schemes for both URPI proposal presentations and URPII final oral presentations

3) URPI and II course outlines

4) the name list of URPII students

5) the name list of panel evaluators for URPII final oral presentations

6) the students' scores in URPII final oral presentations

The most significant official documents in this study were both URPI and II course outlines, the breakdown of URPI and URPII final oral presentation marks, the URPII final oral presentation marking scheme and the students' scores in URPII final oral presentations.

Table 3.15 summarizes the number of respondents in this study and the instruments used in the data collection process:

Table 3.15: The Respondents and the Instruments Used in this Study

Respondents	Instruments
160 students	Questionnaire
44 students	Focus-group Interviews
6 course lecturers	Individual Interviews
7 industry personnel	2 Individual Interviews
	5 Individual Email Interviews
	Relevant official documents

3.4 Data collection procedures

This section reports the procedures and steps involved in collecting data for the study. Data collection procedures were conducted from October 2010 until May 2011. After getting the approval from FCNRE, the researcher had a briefing session with the final year students, in the Main Lecture Hall 1 at Block W, UMP on Wednesday, 13th October 2010, approximately six weeks prior to their URPII final oral presentations. The briefing session started at 2.30 pm and ended at 4.00 pm. During the briefing session, the students were informed of the researcher's current study and their involvement in the study. They were also informed about the two data collection phases which involved questionnaires and focus group interviews.

The first phase of the study took place during the briefing session. In this phase, the adapted version of PRPSA-34 and PRCA-24 questionnaires were administered to all students. After all respondents had given their consent to be part of the study and answered the questionnaire, a total of 160 questionnaires were returned. Then, the questionnaires were thoroughly checked and incomplete questionnaires were excluded. Out of 160 returned questionnaires, 143 questionnaires were complete and 17 questionnaires were found to be incomplete.

The most common missing information was students' matric numbers. In this study, the students' matric numbers are very important because they are used to match the questionnaire results with the URPII final oral presentation scores. Data from a total of 143 completed questionnaires were ready for data entry and data analysis. Prior to data entry, every single questionnaire was numbered and organized systematically according to students' major of studies. After all data from the questionnaires were entered into Statistical Package for Social Sciences (SPSS) software, data analysis was conducted.

On Thursday, 25th November 2010, all final year chemical engineering students carried out their URPII final oral presentations. All scores for students' URPII final oral presentations were obtained from the FCNRE URP Coordinator in early December 2010, which was two weeks after the students' presentations. After the researcher had the results from both questionnaires and the URPII final oral presentations, 135 students were found to fit the participant criteria of this study. To be involved in this study, the students had to follow two important rules. Firstly, the students had to answer the questionnaires completely and return them to the researcher. Secondly, they had to present their URP project orally and attain scores from the panel of evaluators. This was very important because the data from the questionnaires and the presentation scores would help provide answers to three research questions of this study.

The next phase of this study that involved students was the focus group interviews. Initially, the plan was to conduct the focus group interviews soon after the students' URPII final oral presentations in early December 2010, but due to time constraints and the start of the semester break for students, the schedule had to be modified.

Because of this, the next meeting with the students was held in the first week of January 2011, which was soon after their final semester's registration. The meeting was held on Thursday, 6th January 2011, at the same venue for the first meeting, which was the Main Lecture Hall 1, at Block W, UMP. Prior to the meeting, the final year students had a Plant Design lecture at the same lecture hall, from 8.00 p.m. to 9.00 p.m.. Soon after the Plant Design lecture ended, the researcher started the meeting with the students at about 9.15 p.m. She updated the students on their PRPSA-34 and PRCA-24 results and presented the criteria for students to be involved in the next phase, which was the focus group interviews. They were informed that a total of 135 students had scores for both the questionnaires and the URPII final oral presentations and were eligible to be involved in the second phase of the study. A minimum of 42 students and a maximum of 72 students were needed to form six focus groups that comprised seven to twelve people in each focus group. The researcher informed the students that their participation in the focus group interviews was on a voluntary basis.

Then, the researcher read out the 135 students' names who were eligible for the focus group interviews and asked them to stay in the lecture hall. Those who were not selected were informed that they could leave the hall. As the students were leaving the hall, the researcher realized that some of the eligible students were also leaving the hall. However, because the participation of students in the focus group was on voluntary basis, the researcher could not detain them. After a few minutes, there were only a small number of students who remained in the hall. Somewhat disappointed but undeterred, the researcher went on to explain the objectives of the focus group interviews and how vital their participation was in the second phase of this research study.

Students were then asked to form six groups, in which there were two groups from each major of studies. This was purposely done for easy schedule setting as the students' timetable varied according to their major of studies. They were given the opportunity to choose their own group members and each group was given a blank paper for them to write their group members' names. After that, the papers were returned to the researcher and there was a total of 31 students who volunteered to be involved in the focus group interviews.

Before the meeting ended, the researcher asked the groups to set the date and time for the interview based on their availability. After some discussions and negotiations, three groups decided to have the interviews at night and another three groups agreed to have them during the day. Dates were also determined by the students. The researcher informed the students that the venue of the interviews would be determined by her and a confirmation memo would be sent to all interviewees at least two days prior to the date of the interview. All students were reminded to be alert and to check for the memo regularly. The meeting ended at about 11.00 o'clock at night. Table 3.16 below illustrates the set dates, time and venue for the focus group interviews:

Table 3.16: Schedule for Students' Focus Group Interviews

Group	Major of studies	Date	Time	Venue
1	Gas Technology	10 January 2011	8.30 p.m. - 10.00 p.m.	Recording room, MLL CMLHS
2	Biotechnology	11 January 2011	10.00 a.m. - 11.30 a.m.	Recording room, MLL CMLHS
3	Gas Technology	11 January 2011	2.30 p.m. - 4.00 p.m.	Recording room, MLL CMLHS
4	Chemical Engineering	12 January 2011	3.00 p.m. - 4.30 p.m.	Recording room, MLL CMLHS
5	Chemical Engineering	12 January 2011	8.30 p.m. - 10.00 p.m.	Recording room, MLL CMLHS
6	Biotechnology	13 January 2011	8.30 p.m. - 10.00 p.m.	Recording room, MLL CMLHS

A total number of 31 students for the second phase of this study was considered not to be sufficient by the researcher. An electronic memo was then sent to other students the next day, asking for more volunteers. This time another 13 students replied to the memo and agreed to participate in the focus group interviews, making the total of volunteers 44 students. The 13 students were added to the existing groups, based on their major of studies (please see Table 3.14 for the detailed distribution of students' focus groups). A confirmation notice was then sent to all interviewees through an electronic memo, setting out the agreed-upon date and time as well as the venue for the interviews. The venue was set by the researcher because it was much easier for a lecturer (the researcher) to book a room in UMP.

Prior to the interviews, all interviewees were seated in a waiting room, which was adjacent to the interview room. While waiting for some other group members to

come, consent forms were given for them to sign and interview questions were distributed to trigger their thoughts on the topic. The researcher would normally engage with the interviewees by having an informal conversation as an effort to make the interviewees comfortable with her and with the situation. After all the group members turned up, they were led to the interview room which is a Recording Room in MLL, CMLHS, at Block X, UMP. Seating in the Recording Room was arranged in a U-shape with the interviewer (the researcher) sitting in the front section of the U-shape. There were ten chairs in the interview room. Of the ten chairs, eight were for the interviewees and one chair each for the interviewer and the research assistant. There was also a video recorder placed in the corner of the room, ready to record the interviews. Figure 3.3 below illustrates the layout of the interview room:

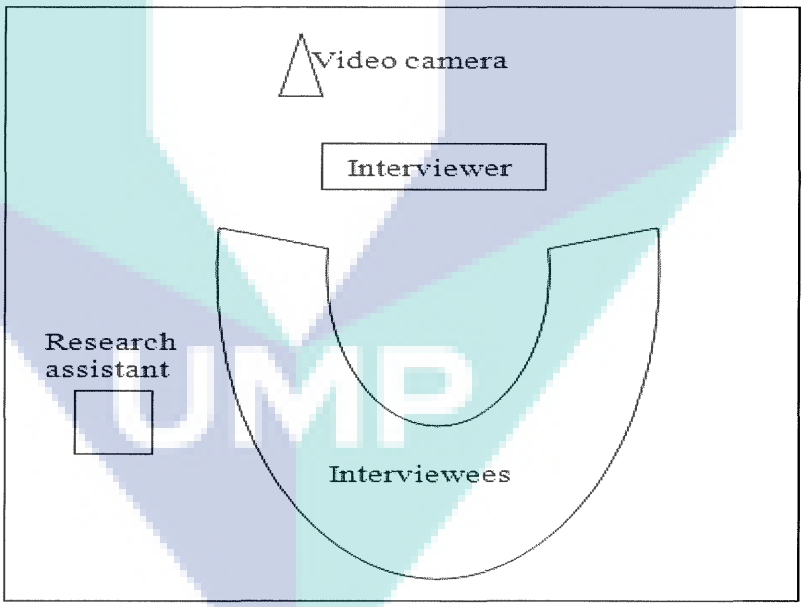


Figure 3.3: The Layout of the Student Focus Group Interview Room

The interviewees were allowed to select their own seats in the interview room. This was to ensure their comfort during the interview session. All interviews were video-recorded with the interviewees' permission and each interview lasted

about 35 to 45 minutes. All interviews were conducted successfully over four consecutive days, in the second week of January 2011.

After completing the focus group interviews with the students, selected faculty lecturers were sent an electronic memo (email) for their agreement to be involved in face-to-face individual interviews. In the memo, the purpose of the semi-structured interviews was made clear to the lecturers. They were also informed that the interviews would be tape-recorded for analysis purposes. In the memo, it was mentioned that if the lecturers agreed to be interviewed, they were asked to reply to the memo and set the time, date and venue for the interviews. This was done to ensure that the time, date and venue matched their own schedule as they had to go for their lectures and had to attend meetings and workshops at work. After three days, all lecturers who were contacted gave their agreement to be involved in this study. One lecturer replied through a memo and the other five contacted the researcher via her mobile phone. All interviews were conducted between January 2011 and February 2011, based on the availability of the faculty lecturers. All lecturers decided to have the interview conducted in their own offices in the faculty. Signed consent forms were returned prior to the interviews. All interviews lasted between 25 and 35 minutes and were audio-recorded with the interviewees' permission. Figure 3.4 illustrates the layout of the interview room:

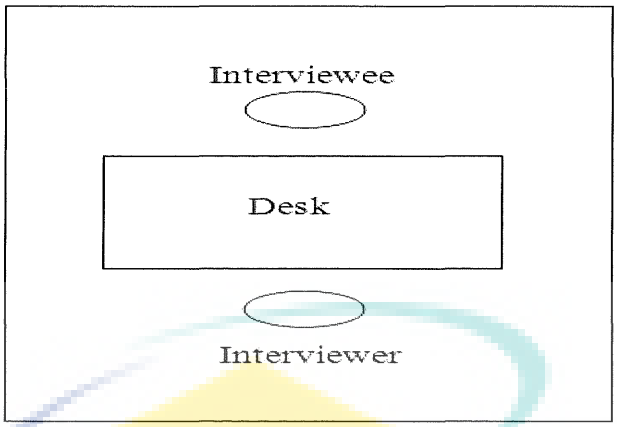


Figure 3.4: Seating Arrangements in the Face-To-Face Interviews with Faculty Lecturers

Concurrently, emails were sent to all 10 industry personnel. The name list of industry personnel was obtained from the URP Coordinator. From the 10 industry personnel contacted, seven agreed to be involved in this study. However, two agreed to be interviewed face-to-face, while the other five asked the researcher to email them the interview questions due to their busy work schedules. For the face-to-face interviews, the researcher contacted the interviewees to set the schedule and the venue for the interviews. The interviewees scheduled the interviews at their convenience and decided to have the interviews at their own offices.

Various reasons were given for not agreeing to be interviewed face-to-face, such as tight schedules and no convenient time to be interviewed. Due to these reasons, the researcher had to resort to the email interview data collection method. Only after multiple email exchanges with the interviewees over almost five months (from January 2011 till May 2011) were the data collection procedures completed.

3.5 Data analysis procedures

Data analysis is viewed as the process used to answer research questions of a study (Merriam, 2009). In this study, both quantitative and qualitative data analysis were conducted.

3.5.1 Analysis of quantitative data

Data from both questionnaires were computed using the Statistical Package for Social Sciences (SPSS) Version 18 for Windows.

In entering the data from the PRPSA-34 questionnaire, data transformation was conducted to a total of 12 items to maintain consistency in the meaning of the responses (Sekaran & Bougie, 2010). The items involved in data transformations were item numbers 4,6,7,8,11,12, 15, 16, 17,18, 24 and 26 (please refer to Appendix 5 for the original version of PRPSA-34). All 12 positively worded items were reverse scored, for instance a 5 (Strongly disagree) was transformed to a 1 (Strongly agree), a 4 to a 2 and so forth. Following that, descriptive statistics such as the means (M) and standard-deviations (SD) were computed and results were generated. To determine the levels of students' anxiety, a specific but simple calculation was provided by McCroskey (1970) to generate the total scores.

In PRCA-24 questionnaires, 6 items were used to measure individuals' oral communication apprehension (OCA) in each communication context, namely Group Situations, Meetings, One-to-one Communication (Dyad) and Public Speaking. Data computed from the questionnaire were analyzed using descriptive statistics, which comprised the means (M) and standard-deviations (SD). Overall OCA levels were calculated using the specific calculation provided (McCroskey, 1982). Prior to that, OCA levels based on each communication context were also calculated.

The Cronbach Alpha coefficient was used to test the internal reliability of the the adapted version of PRPSA-34 and PRCA-24 questionnaires. The result indicates how well the items in the questionnaire positively correlated to each other. If the Cronbach Alpha is near to 1, it indicates a high level of internal consistency reliability.

The adapted version of PRPSA-34 scores and URPII final presentation scores were computed and analyzed using the Pearson Product-Moment correlation to determine the correlation and strength of the relationship between technical oral presentation anxiety and URPII presentation performance.

3.5.2 Analysis of qualitative data

In analysing qualitative data in this study, Creswell's (2011) models of data analysing and data coding were applied. He proposed that the analysis of qualitative data involves six significant steps, which begins with analysing the audio-recorded data gathered from individual interviews, focus group interviews and email interviews. The audio-recorded data were listened to, read thoroughly and transcribed comprehensively. The inductive data analysis goes from the detailed data to more general codes and more broad themes, which are used to explore anxiety experienced by the engineering students. Figure 3.5 (taken from Creswell, 2011, p. 237) below illustrates the processes that were involved in analysing the qualitative data:

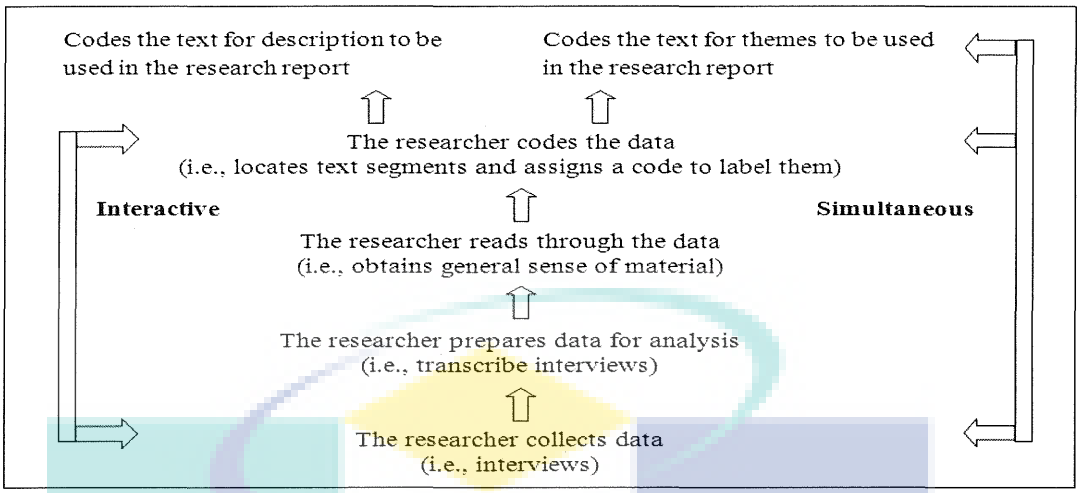


Figure 3.5: The Qualitative Process of Data Analysis (Creswell, 2011, p. 237)

Corbin and Strauss (1990) also suggest systematic procedures in analysing qualitative data. The grounded theory procedure starts with open coding, followed by axial coding and selective coding. Coding is defined as "the process of segmenting and labeling text to form descriptions and broad themes in the data" (Creswell, 2011, p. 243). During the coding process, the researcher scrutinized the interview transcriptions for salient categories through analysis of every single word, phrase and sentence. Simultaneously, constant comparisons were made through the analysis before selecting appropriate codes and categories for the data. After completing the coding and categorization process, the researcher explored the relationships between the categories or themes. This stage is known as axial coding process (Corbin & Strauss, 1990).

According to Creswell (2011), a qualitative report needs to have five to seven themes. The small number of themes is believed to be able to provide detailed information about the problem of the study, rather than reporting general information from many themes. The intertwining of the categories is used to understand the phenomenon understudy thoroughly. Figure 3.6 (taken from Creswell, 2011, p. 244) exemplifies the process of coding qualitative data involved in this study.

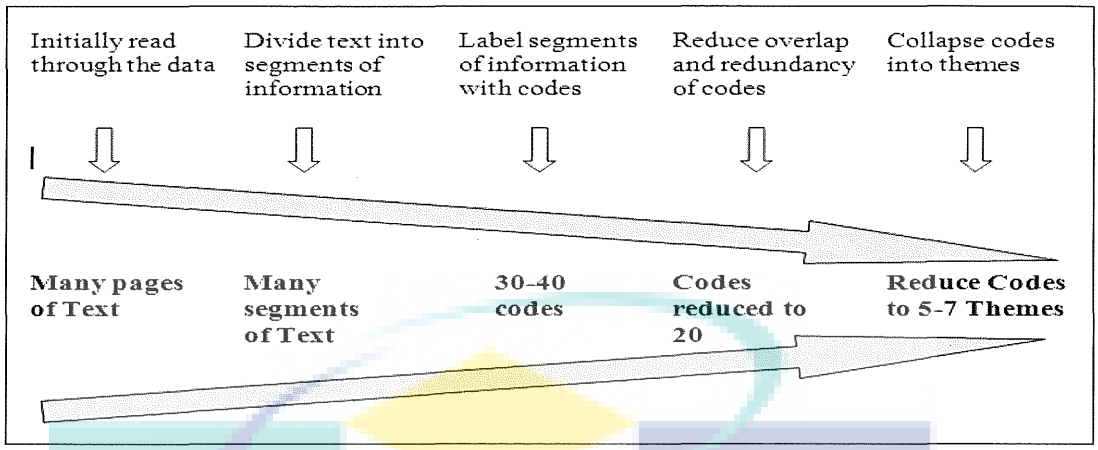


Figure 3.6: A Visual Model of the Coding Process in Qualitative Research (Creswell, 2011, p. 244)

3.6 Validity and reliability of qualitative data

Qualitative validation means "assessing whether the information obtained through the qualitative data collection is accurate" (Creswell & Clark, 2007, p. 134). There are several techniques available to check the accuracy of the data, for instance member checking, triangulation of the data and peer examination. In this study, data were validated through triangulation of the data and peer examination. Data for qualitative enquiry were obtained from semi-structured interviews, focus groups and individual interviews conducted with the students and the panel of evaluators respectively. In addition, peer examination was also done to examine the data. The selected peer was a postgraduate student who had recently conducted qualitative research that also focused on ESL students.

Reliability in qualitative data involves coding comparison among several coders also known as " intercoder agreement " (Creswell & Clark, 2007, p. 135). In this study, the researcher selected two peers - who were her colleagues - to code the transcripts. Then, comparisons of the coding were made and results found that the coders assigned the same codes to the transcript as the researcher's.

3.7 Ethical considerations

Several ethical issues needed to be addressed to ensure that the interests of the respondents and the institution were not violated. Gaining access to the research site, informed consent and confidentiality were among the most important ethical issues that were addressed in this study.

1. Gaining entry in the field.

The success of gaining access to the research field determines the quality of research data (Teddlie & Tashakkori, 2009). For the researcher to access the research site and get engaged with the respondents of the study, getting formal written permissions and approval from the gatekeeper are asked for. Gatekeepers are people who have the authority to grant permission for the researcher to be in contact with the people of the organization (Creswell, 2011). Since the respondents (students and the lecturers) belong to FCNRE, a request for permission was forwarded to the Deputy Dean (Academic and Students Affairs) of FCNRE prior to the start of the study. Once permission was granted, the researcher consulted another gatekeeper, the URP Course Coordinator. During the discussion, the URP Course Coordinator assisted the researcher to get access to the students' name list and also advised the best time and place to meet the students. Getting full support and trust from the gatekeepers has helped the study to run smoothly.

2. Informed consent

To ensure that the respondents had explicit understanding of the research study and risks involved by participating in this study, the respondents were required to read the prepared consent form either by themselves or have it read out for them by the researcher. A verbal explanation was promptly given by the researcher for any questions raised. Once they were well informed about the research, consent was

given by signing and returning the consent forms to the researcher. Only those who agreed to participate in this study were contacted.

3. Assurance of confidentiality

Confidentiality of the data in this study would be safeguarded. The respondents of this study were also well informed about this confidentiality issue. Respondents' identity would be kept confidential and no identification of the individuals would be made in any writing, either in this thesis or in other written articles.

3.8 Summary of the chapter

This chapter outlined the methods and procedures in conducting and completing this research study systematically. It described the respondents involved and the context in which this study took place. The instruments used for data collection purposes were rationalized and data collection procedures were also explained. Subsequently, descriptions on quantitative and qualitative data analysis were also presented. Other relevant and significant issues in conducting research such as validity, reliability and ethical considerations were addressed accordingly.

CHAPTER FOUR

FINDINGS OF THE STUDY

4.0 Introduction

This chapter presents the findings from this study. It will specifically report on the levels of technical oral presentation (TOP) anxiety and the levels of oral communication apprehension experienced by the engineering students. It will also present findings on the relationship between students' level of technical oral presentation anxiety and their URPII final oral presentation scores. Furthermore, the factors that may have contributed to students' technical oral presentation anxiety, as perceived by the students and the panel of evaluators, will also be discussed.

4.1 Undergraduate Research Project (URP) and URPII Final Oral Presentations

This study focuses on students' Undergraduate Research Project (URP)II final oral presentations which were conducted at the end of the URPII course. One of the graduation requirements for UMP engineering students is to register, conduct and complete a written report and finally orally present the outcome of their research of their URP. The URP course is divided into URPI and URPII. URPI is offered in Semester Six and URPII is offered in Semester Seven. In URPI, students must complete their proposal which consists of chapters one, two and three. All students are required to present their proposal before a panel of evaluators. After their proposals are approved by the panel members, students must register for the URPII course in semester seven. They are given one semester to carry out the project which

involves experimentations and lab work. At the end of the semester, they are expected to complete their project, present their project results orally (also known as URPII final oral presentations) and submit a written report.

URPII final oral presentations are significant not only in the URPII course but also in the engineering students' life in UMP because students cannot graduate if they fail to present their project results. Furthermore, unlike the URPI proposal presentations, in the URPII final oral presentations, students are required to present the overall process of their projects and the results derived from the project in 15 minutes before a panel of evaluators.

The next section will report the findings for each of the research question posed in this study.

4.2 RQ1: Students' Technical Oral Presentation Anxiety

To gauge students' level of anxiety in delivering URPII final oral presentations, the adapted version of Personal Report of Public Speaking Anxiety (PRPSA-34) was administered to all respondents.

To measure the internal consistency of items in the adapted version of PRPSA-34, Cronbach's alpha coefficient was applied. It was reported that the Alpha reliability estimate for this instrument in the current study was 0.89 (refer to Table 4.1) suggesting that the items have relatively high internal consistency. While Sekaran and Bougie (2010) posited that when Cronbach's alpha coefficient reliability index is good for value above 0.80, Hair et al. (2010) and Pallant (2005) considered it is acceptable if the value is above 0.70. With a value of 0.89, the scale used in this study is considered good, reliable and acceptable for measuring students' technical oral presentation anxiety.

Table 4.1: Reliability Analysis Scale (Alpha)

Reliability Coefficients		
Number of Cases	Number of Items	Alpha
135	34	0 .898

Table 4.2 below displays the mean and standard deviation of the students' technical oral presentation anxiety. The mean total of the PRPSA-34 score is 109.25, which is moderate, with a standard deviation of 13.43. The minimum and maximum total PRPSA-34 score is 37 and 151 respectively.

Table 4.2: Descriptive Statistics of PRPSA-34 scores

	N	Minimum	Maximum	Mean	Std. Deviation
PRPSA-34	135	37	151	109.25	13.43

Table 4.3 below provides the number and percentage of respondents who were classified as exhibiting high, moderate and low level of anxiety based on their personal report of public speaking anxiety as measured by PRPSA-34 questionnaire.

Table 4.3: Students' Anxiety Levels as Measured by PRPSA-34

Scale	**Respondents**
High anxiety	27 (20.0%)
Moderately high anxiety	36 (26.7%)
Moderate anxiety	62 (45.9%)
Moderately low anxiety	7 (5.2%)
Low anxiety	3 (2.2%)
Total	*135 (100%)*

Data from the table reveal that a total of 27 respondents (20%) reported that they experienced high anxiety and 36 respondents (26.7%) experienced moderately high anxiety. The majority of respondents (45.9%) claimed to have a moderate level of

technical oral presentation anxiety. The rest of the respondents reported feeling moderately low (5.2%) and low anxiety (2.2%) in delivering technical oral presentations in public.

An adapted version of Richmond and McCroskey's (1970) Personal Report of Public Speaking Anxiety (PRPSA-34) questionnaire is proven to be a reliable instrument to measure students' technical oral presentation anxiety in this study. Results also show that a majority of respondents rated themselves to be moderately anxious about presenting their URP projects in front of the panel of evaluators.

4.3 RQ2: Students' Levels of Oral Communication Apprehension

In this study, McCroskey's (1982a) Personal Report of Communication Apprehension (PRCA-24) was used to determine students' level of oral communication apprehension. Internal consistency of the PRCA-24 was assessed using Cronbach's alpha coefficient. The PRCA-24 questionnaire contains four communication contexts, which are group discussions, meetings, dyads and public speaking. Internal consistency was, therefore, assessed based on the four communication contexts.

The Cronbach alpha value for the four communication contexts are as follows: Group Discussion 0.83, Meeting 0.72, Dyad (Interpersonal Communication) 0.72 and Public Speaking 0.78. Sekaran and Bougie (2010) posited that the Cronbach's alpha coefficient reliability index is good for values above 0.80 and Hair et al. (2010) and Pallant (2005) considered it is acceptable if the value is above 0.70. Table 4.4 below illustrates the Alpha reliability estimate for this instrument in the current study. With a value of 0.81, it confirms that the items have relatively high

internal consistency. The scale used in this study is therefore considered good, reliable and acceptable for measuring oral communication apprehension.

Table 4.4: Reliability analysis

Number of Cases	Number of Items	Cronbach's Alpha
135	4	.81

Table 4.5 below presents the mean and the standard deviation of the students' oral communication apprehension in the four communication contexts. The minimum score for all communication events is 6.0 and the maximum score is 30. The highest mean score is in public speaking situation which is 18.23, with a standard deviation of 3.99. The mean score for group discussion is the least with 15.34.

Table 4.5: Descriptive Statistics of PRCA-24 Subscores

	N	Minimum	Maximum	Mean	Std. Deviation
GroupDiscussions	135	7.00	28.00	15.34	3.87
Meetings	135	6.00	27.00	16.14	3.81
Dyad	135	6.00	25.00	16.52	4.14
Public Speaking	135	6.00	30.00	18.23	3.99

Table 4.6 below displays the mean and the standard deviation of the students' oral communication apprehension. The mean of the total PRCA-24 score is 66.25 which is moderate with a standard deviation of 12.69. The minimum total PRCA-24 is 25 and the maximum total PRCA-24 is 103.

Table 4.6: Descriptive Statistics of PRCA-24 Total Scores

	N	Minimum	Maximum	Mean	Std. Deviation
PRCA-24	135	25.00	103.00	66.25	12.69

Table 4.7 below displays the number and percentage of respondents who were classified as having low, moderate or high apprehension levels on PRCA-24 sub-scores in the four communication contexts, which are public speaking, interpersonal conversations, meetings and group discussions. Slightly more than half of the respondents (51.9%) were reported to have high levels of anxiety in delivering speeches in public, followed by engaging in interpersonal conversations (31.1%). In contrast to that, findings show that 25.2% of the respondents were more confident in engaging in group discussions. Low apprehension levels were also recorded for taking parts in meetings (16.3%) and engaging in interpersonal conversations (14.8%).

Table 4.7: Students' Oral Communication Apprehension Levels in the Four Communication Contexts as Measured by PRCA-24

Communication contexts	High	Moderate	Low	Total
Public speaking	70 (51.9%)	53 (39.3%)	12(8.8%)	135 (100%)
Interpersonal conversations	42 (31.1%)	73 (54.1%)	20(14.8%)	135 (100%)
Meetings	36 (26.7%)	77 (57.0%)	22(16.3%)	135 (100%)
Group discussions	26 (19.2%)	75 (55.6%)	34(25.2%)	135 (100%)

Table 4.8 below presents the breakdown of respondents based on their levels of anxiety from the PRCA-24 total scores. As can be seen from the table below, the majority of the respondents (73.3%) reported experiencing a moderate level of oral

assessed on two different criteria. The first is the content of the project and the second is the presentation skills. For the purpose of this study, the technical oral presentation score refers to the marks given on the *presentations skills criteria* which makes up 25% of the whole URPII final oral presentation marks (please refer to Table 3.4). However, for the purpose of this study and easy understanding, the scores were recalculated based on percentage. Table 4.9 below presents the scores (in percentage) that students received for their URPII final oral presentation assessment. From the table, it clearly shows that majority of the students (76 students or 56.3%) obtained high scores of between 80 to 100% and 58 students (43%) received moderate scores between 60 to 79 %. There was only one student whose score was between 40 to 59%, which is the lowest mark given in the assessment.

Table 4.9: Students' URPII Final Oral Presentation Score in Percentage

Score (%)	Number of students
80-100	76 (56.3%)
60-79	58 (43%)
40-59	1 (0.7%)
Total	135 (100%)

The statistical analysis of Pearson product-moment correlation coefficient is used to describe the strength and direction of linear relationship between two continuous variables (Pallant, 2005). In this study, the relationship between students' technical oral presentation anxiety (as measured by an adapted version of Personal Report of Public Speaking Anxiety (PRPSA-34) questionnaire) and Undergraduate Research Project score (as measured by URPII final oral presentation score) were investigated. The results, $r = -.04$ and $p = .60$ ($p > .01$) show that there is a negative weak correlation between the students' technical oral presentation anxiety and students' performance in URPII final oral presentation. However, the correlation

between the two factors is not statistically significant (p=.60) in which it can be interpreted that there is inadequate evidence to illustrate the correlation between the two factors. Table 4.10 below illustrates the correlations between PRPSA-34 score and URPII final oral presentation scores:

Table 4.10: Correlations between PRPSA-34 and URPII Final Oral Presentation Scores

		PRPSA-34	URP
PRPSA-34	Pearson Correlation	1	-.045
	Sig. (2-tailed)		.602
	N	135	135
URP	Pearson Correlation	-.045	1
	Sig. (2-tailed)	.602	
	N	135	135

** Correlation is significant at the 0.01 level (2-tailed).

4.5 RQ4: Factors Contributing to Technical Oral Presentation Anxiety in English

The analysis of focus group interview data required several steps, including participant verification and data coding. The transcriptions were analyzed manually. Repeated themes were looked for and grouped together. The process was done with the help of a qualitative analytical software tool, Weft QDA. During the focus group interview, students were encouraged to use English but they were allowed to use Bahasa Melayu. Therefore, all speech in Bahasa Melayu in this study was translated into English by the researcher, who is a bilingual speaker (proficient in both Malay and English) and great care was taken to ensure that the meaning remained the same. The translations were then validated by another bilingual speaker (proficient in both Malay and English) who is also a communication lecturer at UMP.

The respondents in the focus group interviews were coded based on their major (B for Biotechnology, C for Pure Chemical and G for Gas Technology), number of respondents (according to their seating in the group during the interview) and gender. For instance, a participant with a code of B1/6/F refers to a participant from Biotechnology Group 1 (B1), participant number 6 (6) and a female (F). Company names that were mentioned by the respondents were coded X and Y to protect the identity of the participating companies and to ensure anonymity.

From the interview transcription analysis, six main themes emerged which will be discussed in the following section. Creswell (2011) asserted that the small number of themes (between five to seven themes) is believed to be able to provide detailed information about the problem of the study. The six themes found are related to the evaluation panel, students' English language proficiency, students' technical knowledge, time allocation, students' self-perception of presentation skills and supervisor's roles.

4.5.1 Factor 1: Fear of the evaluators

When students were asked about the factors that contribute to their anxiety during oral presentations, most students mentioned that it was the panel of evaluators. In this URPII final oral presentations, the panel of evaluators comprised faculty lecturers and industry personnel who are working engineers from chemical related industries. Normally, in one assessment room with approximately ten students, there were three faculty lecturers and one personnel from industry. However, in some evaluation rooms, there were only faculty lecturers and no industry personnel present, due to some logistical constraints and technical problems. Since this was the very first time that the faculty had invited industry personnel to be

involved in the URPII final oral presentation evaluation, many of the students were afraid of being evaluated by unknown personnel from industry.

Generally, all students interviewed mentioned the evaluation panel to be the major source of their anxiety in delivering URPII final oral presentations. For these students, the presence of the panel made them very nervous. When a female student was asked about the main factor that made her nervous, she answered, "*To me, it was the panel" (B1/7/F/).* In fact, just thinking of the panel made one female student anxious, as she mentioned, "*I was so anxious thinking of who would be on my panel."(C1/2/F).* Three days prior to the presentations, the arrangement for the rooms, the name list of students and the list of the evaluation panel were put up on the faculty notice board. Even though the students said they looked forward to their presentations, they told the researcher they felt nervous once they saw the panel list. For instance, one student majoring in Pure Chemical said:

C1/6/F: For me, the nervousness to present started the minute I got to know the evaluators' names. The panel had a large impact on me as they were experts and were aware of what we did. Sometimes, I couldn't even sleep, I was scared, thinking of how to present before the panel and of the questions that would be asked of me.

B2/1/F: *Ok, when I got to know the evaluators' names, I could not breathe properly. I was so anxious and I couldn't even sleep. Sometimes, our fate depends on the panel.*

4.5.1.1 Presence of industry personnel

The presence of personnel from the industry in the panel affected the majority of the students. Several respondents from the different major of studies expressed the following sentiments:

B2/7/F: For me, as the panel is from industry, that made me a bit nervous.

G1/6/M: I felt so nervous after I found out from the panel list that one of my panel members is the representative from company Y.

G1/7/F: I knew that there would be a killer panel member and found out that the panel member is from company Y. That night, I couldn't sleep because I was so nervous, thinking of the evaluators and the presentation itself.

G1/6/M: I think what affects me the the most is the panel of evaluators because the first thing that comes to my mind is the industry personnel. So when I looked at the name list and I saw the name of the evaluator from company Y, I was depressed and worried.

B1/6/F: I felt so stressful when I got to know the panel is from company X and they actually conduct similar research.

G2/2/F: My nervousness gets even worse because there is an evaluator from company Y.

C2/6/F: When the first group came out of the room, they said that there are evaluators from the industry. Suddenly, I was nervous and scared like hell.

4.5.1.2 Presence of strict faculty lecturers

Not only did the presence of the personnel from industry made the students anxious, the presence of certain strict faculty lecturers also became the source of the students' anxiety. As they pointed out:

G2/2/F: I was so nervous during the presentation because I am so afraid of Mr. A. He is so well-known for posing killer questions.

G1/6/M: One faculty lecturer who is very well-known as a strict evaluator is Mr. A. He is the head of the gas department. Knowing that he will be there makes me feel down and less confident.

G1/4/M: Having strict evaluators evaluating my presentation makes me so nervous.. as a result, a lot of information was kept to myself.

4.5.1.3 Expertise of the evaluators

The expertise of the evaluators is another factor that was reported to affect the level of nervousness in some of the students. Several students expressed the following views:

B2/1/F*: My nervourness heightens when I know that my topic is the evaluator's field of expertise.*

B1/7/F: *If the evaluators are experts in the content of our presentation that creates problems. Most of the time, oral presentations are so stressful because normally we present before the experts. That creates problems.*

C2/7/F: *If he is an expert in the field, he can definitely detect our weaknesses.*

B1/6/F: *Prior to our presentation day, I got to know that the panel is from company X. As far as I know, they conduct similar research to mine. This makes me stressed.*

B2/6/M: I know that the evaluators are the experts in my topic and that makes me feel nervous.

It can be summarized that many students view evaluators' expertise in the field as a source of their anxiety.

4.5.1.4 Reactions from the evaluators

Besides the evaluators' presence and expertise, these students also claimed that the evaluators' negative reaction also increased their anxiety levels in delivering their URPII final oral presentations. Some respondents described the panel as harsh and mean, as depicted in the following excerpts taken from the student focus group interviews:

B1/5/F : *My panel was quite harsh.*

C1/6/F: *Because my panel members were harsh and cruel to me during my oral presentation, I cried in front of them, because it seemed that they tried to intimidate me. I couldn't sleep remembering how the panel reacted to my presentation.*

B1/7/F: *There are some faculty lecturers who are well known for being harsh and posing many questions. Even though I knew the answer, I stammered in giving the answers because I was so nervous.*

Some of the students felt anxious to the extent that the evaluators are believed to always find fault in their project and thus, "kill" or fail their URP projects. The students expressed their level of stress in the following excerpts:

C1/5/F: *Well, my URP project was on the brink of failure. I faced a lot of problems in completing my project. My project was on polymer and the panel was the experts in polymer. This is killing me.*

C2/1/F: *The panel is the expert in polymer, at that moment, I know, that's it.*

C2/7/F: *I was nervous. Everything was OK at the beginning, but at the end of the presentation, I was attacked by the evaluators. It was related to the machine that I used in my experiment.*

B1/5/F : *Of course I felt nervous even though I think I made enough preparation. If we are the first or the second presenter, I think it is not so stressful because we don't get the chance to see others and how they are criticized by the evaluators.*

One female participant (G2/1/F) while waiting for her turn to present observed that the panel members were very critical in "attacking" the students' projects. They did not only "attack" the project objectives and the discussion , but also criticized the project title. That caused her to become more anxious in presenting her own URP project before the same evaluation panel.

In addition, some students reported that the angry facial expressions shown by some panel members were also very disturbing. They claimed:

B1/6/F: When the panel displayed some kinds of unpleasant facial expressions during my presentation, it made me very nervous.

C1/4/F: The expression of the panel was very disturbing during the presentation. The expressions of the panel made me become nervous.

Responses from several students reveal that negative reactions from evaluators heighten the students' anxiety in delivering technical oral presentations effectively.

4.5.1.5 Questions posed by the evaluators

Questions posed by the evaluation panel that were aimed to test the students' understanding of their URP project also contributed to students' anxiety. Thinking of the possible questions that would be posed by the evaluation panel made them feel worried about their oral presentations. The feelings were described as follows:

G1/4/M: *Before the presentation, I was nervous thinking of what questions the panel would ask me. I was afraid I cannot answer the questions.*

G2/2/F: *I was afraid of the questions the panel would ask me and scared in case the panel said that my project is not relevant and I need to repeat my URP course.*

C2/1/F*: I was scared thinking of questions posed by the panel.*

On the questions posed, one male participant (B2/6/M) shared his bad experience when unexpected questions were asked by the panel during his oral presentation. As he had not prepared answers to the questions (as they were unexpected), they made him very nervous. According to the student, the situation became worse when he was speechless and could not answer the questions due to his high level of anxiety.

Several other students who were from all three major courses (Pure Chemical, Gas Technology and Biotechnology) also faced similar situations of becoming speechless and feeling confused when they were posed questions from their panel of evaluators. They stated:

C2/6/F: *When the questions were asked, I became nervous, I couldn't think of the right answer. I don't know why that happens because I know the answers, but at that moment, my mind went a complete blank.*

B2/3/F: *The experiment was conducted by me, so I should know more about it, but when questions were posed, I was lost. Everything went haywire, I was afraid that I might give false information.*

G2/5/M: *I became confused and nervous. I am afraid that my answers did not answer the panel questions correctly.*

A female Biotechnology (B2/1/F) student shared her worst experience when the panel "attacked" her with provocative questions. She told the researcher that she got frightened by the manner in which they posed questions to her. The female student felt as if the evaluation panel was trying to find fault with her project. She claimed that it was the worst experience in her academic life.

The findings reveal that high expectations imposed by the evaluators through provocative and challenging questions contributed to students' high level of anxiety in presenting their URPII final oral presentations.

4.5.1.6 Interruptions by evaluators

In addition, data from the focus group interviews also illustrated the fact that interruptions made by the panel during students' presentations (whether to give comments or seek further clarifications) resulted in making the students feel more

anxious, thus affecting students' confidence level in effectively presenting their URP project. Some of the comments made by the students are as follows:

B2/3/F : Sometimes the evaluators like to interfere. Initially, my confidence level in presenting was high, but when the panel interfered in the midst of my presentation, I felt lost, nervous and even forgot where I had stopped prior to their intervention.

B1/5/F : It really bothered me when the panel interrupted my presentation to ask me questions.

G1/4/M: It really bothered me when the panel cut my presentation short to give comments and suggestions. For example, one of the panelist asked me to put graphs in the presentation. Suddenly my confidence level was pulled down, I became really nervous because I knew it was my fault.

G2/6/F: When the panel interrupted my presentation and posed questions, and I was not so sure of my given answers, it affected my concentration as I was afraid whether or not my answers were correct.

Findings have shown that the idea of presenting before the evaluation panel affected students' levels of anxiety and this was made worse when they were interrupted during their oral presentations. The interruptions from the panel of evaluators affected the student's focus and their self-confidence in giving effective presentations.

4.5.2 Factor 2: Barriers in students' English language proficiency

All students in the focus group interview agreed that English is another large factor that induced their anxiety in delivering URPII final oral presentations. Many of the students talked about their level of English as the main barrier that hindered them from giving their best performance, so affecting their overall URP marks. Several students admitted to their weaknesses in English as they stated:

C1/2/F: I don't like presenting in English because I am weak in English. I find it difficult to master English and I am scared to express my ideas in English, especially before the evaluation panel. If there are questions asked, I have no idea on how to provide good answers in English.

G1/8/F: *I don't like doing presentations in English because when I am nervous, I couldn't even find the simplest words. If the presentations are delivered in Bahasa Melayu, I am very confident. Even though I am not prepared, I can present successfully.*

C2/3/M: *I was nervous when presenting my URP, but I let it go, I said to myself, just present even though my English is weak. One evaluator commented on my poor English and he said that my English is influenced by my mother tongue and he asked me to improve my English language.*

C2/6/F: *English is one of the factors that make me nervous.*

C1/1/F: *I have problems in English, I have things to say but I cannot speak clearly, that is the problem.*

B2/5/F: *One more thing (problem) is to make other people understand, I know what I want to say, but I am afraid that other people cannot understand me because of my inability to express ideas well in English.*

C2/3/M: *My English sentences are not smooth. If I present in English, people will have a different perspective about me. They might think that I am not good.*

B2/7/F: *I always have problems in creating English sentences, especially how to begin a sentence.*

In sharing both their weaknesses in the English language and showing how it affected the smooth flow of their presentations, some of the students highlighted that their limited English vocabulary hindered them from expressing their ideas clearly. The following excerpts illustrate this point:

G1/3/F : Frankly speaking, I don't like doing presentations in English. Maybe because I know I am weak in English and most importantly, my vocabulary is very limited.

C2/4/F : English is the main problem. I am afraid that people will misinterpret my words, I mean, I want to say A, but people understand B. My English vocabulary is limited because I use Bahasa Melayu in our everyday conversation.

C2/1/F: *If it is in Bahasa Melayu* (participant's native language*), I can explain clearly, but when it is in English, sometimes the language does not permit me to convey my message clearly because I have a limited vocabulary. Before the presentation, I was scared thinking of who would be my evaluators. I was hoping that there will be no expatriate evaluators. I am afraid that my messages will not be conveyed successfully in English and they cannot understand my point. I was so relieved when I got to know that all my evaluators were Malays.*

G2/3/F: *When questions posed to me, I tried to answer all the questions. But there was a problem where sometimes my mind went blank when I couldn't find the exact words in English or not sure of how to pronounce certain words correctly.*

The fact that English is the medium of presentation for URPII final oral presentation assessment has put more pressure on some students and aggravated their anxiety in giving effective presentations. Data from the interviews revealed that students found it difficult to explain facts about their projects clearly because of their low proficiency in the English language. Some students also pointed out that with their somewhat limited English vocabulary, they were afraid that their answers to questions posed by the evaluators were not answered correctly and accurately. These facts were reported to have prevented the students from giving successful presentations and this may very well have affected their marks and overall performance.

4.5.3 Factor 3: Limited technical knowledge

Limited technical knowledge is another main source of anxiety that was raised by the respondents. Many respondents were nervous to present their URP project results for several reasons. There were respondents who stated that the problems they encountered with their project results caused them to feel scared and this gravely affected their presentation performance. They said:

B2/4/F: I was nervous, because the research was not complete and the panel members knew about it.

B1/6/F: My presentation wasn't that good, because the URP results were not OK.

C1/2/F: I was scared to present because of the limited results.

C1/3/F: I had mixed feelings about presenting. I had problems with the results. My results were not correct because I used a different machine. So, I had different results, therefore, the evaluation panel criticized me heavily on the results.

B1/7/F: I was so stressed thinking about my project results and how I was going to present them to the panel.

C2/8/F: For me, the main factor could be the results section of my project because my project was experimental and I did not have any previous experience on experimental projects. Therefore, I did it my own way, by using my own method. I was so afraid if it may be wrong because industry people know better. I was really afraid if what I did was totally wrong.

Not only problems with the project made students felt nervous, just the thought of having to give a presentation on the project result had also made one participant felt anxious as she said:

G2/3/F: I was so nervous thinking of presenting my project results. Normally, if I am nervous, I feel dizzy, like fainting. I don't know why, but I felt like fainting just thinking of the prospect of presenting.

Findings from the interviews reveal that students who faced problems with their project, be it incomplete or limited results, were reported to feel anxious to do their presentations in front of the evaluators.

4.5.4 Factor 4: Time constraints

To present the project, the students were allotted 15 minutes for presentation and 10 minutes for the question and answer session. To further emphasize the importance of presenting within the given time, marks were deducted for exceeding and running below the time by two minutes which means one mark would be deducted for exceeding 1 minute and vice versa. Due to that fact, some students said this also triggered feelings of apprehension in them when they were to deliver the presentations. The constraints of time were pointed out by several students:

C1/1/F: To me, it's time. I was nervous thinking of the given time, whether or not I was able to present all the necessary information.

G1/5/M: Besides, I think time is also a constraint. If the person has a lot of results or information, he might exceed the given time, while if the person has few results, he may finish early (which will affect the marks).

G2/4/M: I didn't face any problem during the presentation. It's just that I didn't have enough time. There was so much information to be shared. I wanted to explain everything so that they understand. Furthermore, there were personnel from industry, I was afraid that they did not understand what I was doing (my project).

B1/3/F: I think it's the limited time given that makes me nervous.

B1/4/F: In my opinion, the time limit made me nervous. Within 15 minutes, I had 8 results to be presented. With the limited time given, I was a bit frenzied and became disorganized.

Since time is one of the criteria evaluated in the URPII final oral presentation assessment, it is reported to have a negative impact to students' feeling of anxiety in performing and presenting their results in front of the evaluators. The findings show that some students were too ambitious and attempted to present all of the results obtained from their project within the allocated 15 minutes. With limited time given, students were indirectly taught to manage their data and time properly. By choosing pertinent and important points, students were believed to be able to manage their presentations effectively.

4.5.5 Factor 5: Attitudes towards technical oral presentations

In the focus group interviews, the attitude of the respondents towards the technical oral presentations was analyzed. Some respondents perceived delivering oral presentations as a very challenging task. In fact, one participant admitted that she thought about the challenging task all the time. As she said:

G2/3/F: To me, doing oral presentation is tough. I tend to think a lot about it, for example, how people would react to my presentation, what about my own performance, what if I stutter during the presentation, what if I cannot convey the information, what if my mind goes blank.

Some respondents admitted that their weaknesses, such as having low self-confidence and experiencing high level of anxiety in doing the presentation, had an effect on their performance. Self-confidence is an attitude which allows individuals to have positive yet realistic views of themselves and their situations. Several respondents reported that they had low self-confidence in presenting in public. As they confessed:

G1/3/F: My confidence level is very low, I can't face the public. If I present in public, I know people are looking at me, that makes me unable to speak.

B1/3/F: I know I was not confident, I did not think of the panel and about others, however, all of a sudden, I started to feel anxious.

There were two male students majoring in Gas Technology who claimed that they were scared of themselves. They said:

G1/5/M: I fear myself. I am afraid that I'll lose confidence and become blank. It is all my mindset.

G2/5/M: I am afraid of myself and lack of confidence, I just don't know why. Normally, I am excited thinking of presentations, but when the time comes, I am afraid of myself. I dont know why. I think I can present, but when my turn comes, I cannot present effectively. That's why I think I have problems with myself.

The feeling of anxiousness had also been bothering a number of respondents. For some students, this made their minds went blank. It was believed that the situation negatively impacted their presentation performance to a certain extent. They shared their experiences in the focus group interviews:

G1/1/M: For me, I think it is the feeling of nervousness that bothers because when I am nervous, my mind goes blank, I cannot think of anything to say or present, even though I was well prepared.

G1/2/F: To me, the factor that bothers me most is the feeling of nervousness. Even though I was well prepared, the nervousness makes my mind goes blank.

B1/3/F: *I have never changed, I am always anxious when it comes to presentations.*

The findings above show that a number of students had negative thinking about technical oral presentations that had caused them to feel anxious. It can be summarized that having negative attitude towards technical oral presentations is one of the sources of the students' presentation anxiety.

4.5.6 Factor 6: Role of the supervisor

From the interviews conducted, it was found that supervisors play an important role in giving students more self-confidence in presenting their URPII results. The supervisor's support is believed to help alleviate students' anxiety in delivering their URPII final oral presentations. With regard to the role of the project supervisor, some students complained about their supervisors not being helpful and this added to their stress. They complained:

B1/1/F: My supervisor makes me stressed. He always pushes me to do a lot of things.

C1/3/F : I feel tense having a supervisor like him.

G2/4/M: *My supervisor gives me more stress. He only said "I think you can do it, I've seen your slides, I've made corrections and I've returned them. Now is your turn to present. Good luck". Whatever it is, we have to bear the stress alone, and say a lot of prayers.*

B1/3/F: Yes, I agree that my supervisor's comments should strengthen my project, but sometimes the comments given are ridiculous or illogical. That heightens my stress.

C1/4/F: *My supervisor was not very helpful with my URP presentation's preparation. In fact, I faced a lot of problems while conducting the project , for example there are pieces of equipment which are out of order or not working correctly.*

C1/8/F: We share the same supervisor (referring to C1/4/F). So, for us, he is not that helpful. We came back thinking of how we should present our project

A student also commented about her supervisor being too demanding, *"My supervisor asks a lot from me" (B1/2/F).* That contributed to her not having enough time to do adequate preparation for her presentation. She added, "*I was more concerned about the content in my slides. I have no freedom at all, everything must follow his way".*

One student recalled his experience with her supervisor. She said, *"One of my evaluators was my supervisor. He said that if he became my evaluator, I must be ready because he is the only person who knows my project. That makes me confused. What questions would my supervisor ask me during the presentation? That makes me very anxious".(C1/3/F)*

The findings draw our attention to supervisors' negative attitude which gives negative impacts to their supervisees. Generally, the supervisors are to guide, assist and motivate their supervisees in completing their URP project, nonetheless, they also could discourage and hence heighten the students' anxiousness.

In conclusion, findings from the focus group interviews show the factors that are perceived by the students to induce their anxiety in delivering URPII final oral presentations effectively. The factors include the fear of the panel of evaluators, barriers in students' English language proficiency and limited technical knowledge.

In addition, the students also highlighted that time constraint, self-perception of their presentation skills and the role of the supervisor caused them to feel apprehensive in the delivery of the technical oral presentations.

4.6 RQ5: Evaluators' Perceptions of Students' Technical Oral Presentation Anxiety

The findings will be presented in the following sequence: 1) the level of students' anxiety as perceived by the panel of evaluators; 2) speech anxiety symptoms and 3) sources of students' anxiety.

The respondents in the interviews were coded based on their job specifications (FL for faculty lecturer and IP for industry personnel), gender and the participant's number. For instance, a participant with code: FL/F/1 refers to participant who is a faculty lecturer, a female and participant number one. Even though the interviews were conducted in English, the respondents were also given a choice to speak in Bahasa Melayu. Therefore, all speech in Bahasa Melayu was translated into English by the researcher who is a bilingual speaker (proficient in both English and Malay) and great care was taken to ensure that the meaning of the utterances remain the same. The translations were then validated by another communication lecturer (proficient in both English and Malay) at UMP as was done in the student focus group interviews.

4.6.1 The level of students' anxiety

When the industry personnel were asked about students' level of anxiety in delivering URP final oral presentations, they gave mixed perceptions. Some found students' anxiety to be noticeable, while some said the students managed to

successfully cover their symptoms of anxiety. They shared their experiences based on their observations. Most of the industry personnel found that only a minority of the students showed their nervousness in delivering URPII final oral presentations. Below are excerpts from interviews with selected members of the industry personnel:

IP/M/3: Three out of eleven students were nervous; the rest seemed to be comfortable with their presentations.

IP/M/2: From my observation, 40 % looked nervous, and 60 % were confident with their presentations. I would say that their anxiety level is minimal.

IP/M/1: On average, only one or two students looked nervous.

Nevertheless, there was one faculty lecturer who shared a similar opinion regarding students' low level of anxiety when he said, *"I think, students nowadays are more relaxed and less nervous" (FL/M/1).*

While most of the industry personnel reported that most of the students were confident, several faculty lecturers had different perspectives. They shared the following views with the researcher:

FL/F/3: *Hmm..yes, from my observation, I found the students' standard of performance is getting worse, because the students are less confident compared to the previous batches of students.*

FL/M/6: *The majority of my supervisees or the students whom I evaluated, were still nervous. From my observation, the level of their anxiety is exponential, I mean, at the beginning of conducting the URP project, the anxiety level started to increase but very slowly. Then when the presentation time is just around the corner, it shoots up drastically.*

However, there were two industry personnel who shared similar opinions with the faculty lecturers on the students' high level of anxiety. They commented:

IP/M/7: Anxiety is a common obsession in student's life especially when it comes to the presentation session. Based on my experienced in judging PSM recently, I noticed that most of the students felt very nervous when they need to stand up alone in front of the three panel members and deliver their presentation speech even though they just look as if they are reading directly from their power point slides on the screen.

IP/F/6: The students' anxiety was above normal. This could be due to not having enough skill and experience in presentation, or not being satisfied with the written report, or the outcome of the project and also their poor command of the English language.

The findings from this study reveal that mixed perceptions were held by the evaluators about students' levels of anxiety in presenting their URP results. Some students were observed to experience high levels of anxiety while some students were seen to successfully overcome their feelings of anxiety.

4.6.2 Speech anxiety symptoms

During the interviews, the evaluation panel were also asked about their observations regarding speech anxiety symptoms manifested by any of the students during their URPII final oral presentations. From the descriptions given by the various evaluators, the anxiety symptoms can be categorized into three reactions: physiological reactions (such as sweating, racing heart and blushing), cognitive reactions symptoms (such as worrying about performance and mind going blank) and

behavioural reactions (such as fidgeting, talking too much and stuttering) (Woodrow, 2006). Some of the evaluators related the students' anxiety symptoms with reasons for their anxiety, for instance, the unpreparedness of the students and their own nervousness. As the evaluators stated:

FL/M/4: We can sense if the students are not prepared. I can see their nervousness reflected from their feeling of low confidence, from their facial expressions and body language. Sometimes, they scratched their heads, avoided having eye contact, read from the slides, mumbled and had long pauses in their speech.

FL/F/3: *Most of the time, the student trembled, did not make eye contact, shook when holding papers, and could not answer questions. We had to repeat the questions as if they could not understand, but I believe that it was not because they did not understand, but that was because of their nervousness.*

FL/F/5: They were not confident. This can be seen from their body language. Students tend to look at the prepared slides, repeat the same words and even the same points.

Below are the symptoms that were displayed by the students based on observations by the panel of evaluators:

FL/M/6: Yes, I could see some of the symptoms, for instance the physical symptoms. We could see their hands trembling when holding their papers and their voices were sounded nervous.

FL/M/1 : OK, firstly, they forgot certain important elements such as introducing themselves and introducing their supervisor. Secondly, they showed more nervousness at the beginning of their presentations. If they don't have the confidence, they cannot answer our questions. When they were asked about A, they answered B. That was very clear.

IP/M/5: They faced several problems for instance, their voices were not smooth and they had problems with pronunciation. Sometimes, the pointer holding was shaking, sometimes they could not find English words and therefore, they resorted to using Malay words. In engineering, if the evaluators were all Malays, they sometimes let the students use Malay words, because the most important thing is the message conveyed.

IP/M/1 : Students are usually lost for words, they could not explain, and tend to hope for the answers to be given to them.

IP/M/2 : Anxiety symptoms that have been demonstrated by the students include mumbling, losing focus, not making eye contact with us and being quiet, which also reflects the students' nervousness.

IP/F/6: For instance, they fail to speak in full sentences, they stammer and seem unable to explain queries efficiently

IP/M/7: Their hands were shaking during presentations. When they panic, they cannot answer the questions asked, they tend to lose focus during their presentation. They tend to use a lot of empty fillers such as 'eeer' and 'mmm'.

There were, however, two evaluators who did not observe any physical symptoms manifested by the students. They claimed that:

IP/M/3: I could not see any anxiety symptoms, physically. But these students tend to mumble, perhaps physical anxiety can be translated as mumbling.

FL/M/6: From my own observations, the students were able to cover up their feeling of nervousness. I believe they learned it in their soft skills lesson.

One faculty lecturer stated that the students' anxiety would decrease as the students were giving the presentations. He explained, "*Sometimes the symptoms exist in the first two to three minutes only and then throughout the rest of the presentation, students get more confident."(FL/M/6)*

The interview findings reveal that students did display anxiety symptoms during their URPII final oral presentations. Some of the symptoms were apparent and they did affect the students' presentation performance.

4.6.3 Sources of students' anxiety

The third part provides discussion on the sources of students' anxiety as perceived by the faculty lecturers and the industry personnel while evaluating the students' URP final presentations. Analysis from the interviews held with the panel of evaluators shows 5 emerging themes for sources of anxiety, such as limited technical knowledge, panel of evaluators, preparation, English language and presentation skill.

4.6.3.1 Limited technical knowledge

In evaluating the students' presentations, most of the evaluators could sense and observe the feeling of anxiety projected by the students due to various reasons. The majority of the evaluators believed that the students' limited knowledge of the

subject matter was one of the main sources of anxiety in delivering their presentations. It was clearly stated by one evaluator from industry that "*The first factor is the knowledge of technical subject". (IP/M/3)*

Some faculty lecturers (who were also URP supervisors) commented that some of the students were found not confident in presenting their project. According to one faculty lecturer, there was one student who came to her and told her that:

FL/F/3: He did not want to present because he did not understand the experiment and he was not satisfied with his work. He did not understand, that's why he didn't want to present.

Even though the industry personnel did not directly engage with any of the students' URP project, one of them had a similar point of view regarding the students' main source of anxiety. He pointed out that *"Students are mostly worried if the content of the presentation is inaccurate" (IP/M/1).*

In order for one person to have confidence in delivering a presentation, one faculty lecturer emphasized the need to know the subject matter. He went on to explain:

FL/M/6: The most important thing is you know what you are going to present. You have your mind set, and this could lead to low anxiety. I suppose the students must have the knowledge of what they are going to present because that would reduce their anxiety level.

Many evaluators believed that the students were anxious to deliver their presentations because of various reasons related to their URP project. They reported:

FL/M/4: There are students who told me that they are not confident with their data, their findings and they cannot justify their results.

FL/F/3: From my own analysis, many students were not confident with their projects. They didn't know and were not clear what they were doing. That's why some of them cannot present.

IP/M/7: They did not understand their own research.

FL/F/5: *The level of anxiety reflects their experiment output (results). The output caused them to have less confidence in presenting, especially when they are not sure of the results, whether the results are correct, sufficient or limited or whether they have achieved their objectives. This could be due to lack of equipment when carrying out the experiment.*

IP/M/2: Incomplete research could also lead students to have low self-confidence and experience anxiety in presenting their project.

One faculty lecturer described the general problems faced by the students in completing their URP project:

FL/M/4: Sometimes, they have problems in justifying their results and in discussing their results in relation to theory. That is one of the weaknesses possessed by many of our students. Maybe they don't have a strong fundamental knowledge of their project. For example, if it is on membrane, and he did not read the appropriate journals related to membrane, that limits his knowledge on that subject matter. So, if we ask them, many students are not clear of what they are doing, and they are lacking that particular knowledge and that makes them worry.

The faculty lecturer's point of view was supported by one evaluator from industry . He said that *"The students were lacking relevant information due to limited reading of relevant materials"*. (IP/M/4)

With limited knowledge on the subject matter (in this case their URP project), the students were seen to show their anxiousness during the question and answer session. The students were reported to confess to their supervisor who was also on the panel of URPII final presentations that they were afraid of the questions posed. She said

FL/F/3: He was afraid of the questions that would be asked of him. The student said I am afraid I cannot answer the questions. That means, he felt that he lacked sufficient knowledge, he did not really understand the experiment.

One industry evaluator believed that the students are scared "*if they cannot answer the given questions". (IP/M/1)*

However, it was explained by one of the industry evaluators *(IP/M/5)* that *"Sometimes questions from the evaluators are just to test the students' knowledge of the subject matter, whether they have read enough or limited their reading to their study."* He elaborated on this by saying that *"Very small number of students actually read international journals or magazines such as IEEE. They did not read, they did not go beyond their topic."*

One faculty lecturer expressed his opinion about this matter by saying that:

FL/M/1: Sometimes, the students can carry out the experiment, but the depth of their technical knowledge does not reach the evaluators' expectations. The lack of technical knowledge causes the students to feel anxious about the presentation.

In summary, the panel of evaluators formed the opinion that the students' limited technical knowledge on their project generated anxiety among the students. Wrong results, technical glitches or incomplete projects are among the reasons for students feeling anxious when delivering their URPII final oral presentations.

4.6.3.2 Panel of evaluators

The other source of anxiety mentioned by the panel of evaluators is the presence of the evaluators themselves. Since the students had known their faculty lecturers from their first year in UMP, most of them knew who were the lenient evaluators and who were stringent evaluators. So, the faculty lecturers believed that panel members may cause the students to be more anxious when delivering their presentations. Several faculty lecturers stated:

FL/F/3: Students were afraid of the evaluators. Stringent evaluators...that is one factor as well.

FL/F/5: I think the panel of evaluators does have an effect, one that causes students to feel more anxious.

Besides feeling anxiety because of their own faculty lecturers (as pointed by two industry evaluators, IP/M/2 and IP/M/7), students were also affected by the presence of industry personnel on their panel of evaluators. Based on the evaluators' observations, they voiced the following opinions:

IP/M/2: It could be that the lecturer has criticized them previously and they are anxious that this might happen again.

IP/M/7: The students were scared of well known panel members.

FL/M/6: Especially when they have to face the expert panel, which is made up not only of the faculty lecturers, but also the representatives from industry.

FL/M/4: The panel could be the factor. Also, our system invites evaluators from the appropriate industry, so they may feel anxious with the presence of those evaluators.

One faculty lecturer elaborated on the extent to which responses from the evaluators impacted on the smoothness of students' URPII final oral presentations. As far as the evaluators' responses are concerned, he stated:

FL/M/1: Firstly, it concerns the evaluators. Sometimes the students look at the evaluators and if the evaluator is friendly, fewer questions may be asked. If the presentation is ok, he or she will ask more. But if the evaluator is vicious, or strict in terms of evaluations, that will create anxiety in the students. Therefore, the presentations will not be smooth. She will be anxious because she is afraid of the panel.

Identifying the panel of evaluators as an external factor, one faculty lecturer believed that student's perceptions of and expectations from the panel of evaluators influenced their presentations delivery. He stated by giving an example:

FL/M/6 : For instance the panel of evaluators. May be these students have concentrated on these evaluators. Even though he really knows what he is doing, when he knows that the panel prefer to ask questions, ridiculous questions, that disturbs him. I mean, not ridiculous questions. For example, if the student is good in methodology of the project, but weak in theory, perhaps his expectations of the panel influence his presentation.

According to one faculty lecturer (FL/M/4), *"There are several categories of panel"*. He continued to explain:

FL/M/4: A good panel will help students to answer the questions, if the student does not know the answer; he will give some clues and so on. But students will feel scared with a provocative panel. At some point, a provocative panel is relatively good because they are testing the students' ability to provide justifications of their projects. Like I say, if the panel are moderate, the students will not feel anything. If in other universities, some students may even cry during URP presentations. But here in UMP, we only test whether they can answer and justify their points. However, feeling scared of the panel will be a constant.

One faculty lecturer (FL/M/6) recalled his experience of being on the evaluation panel during URPII final oral presentations. He stated *"there are some evaluators who are provocative, that aggravate students' anxiety"*. Furthermore, there were also evaluators who often interrupted students' presentation. One industry evaluator (IP/M/1) who saw interruption as a factor creating more anxiety in students, strongly suggested that *"Evaluators should interrupt as less as possible during the presentation even prior to start."*

After each URPII final oral presentation, the student will usually receive both positive and negative feedback. One faculty lecturer (FL/M/6) strongly believed that negative feedback had a great effect on students. He recalled one situation where he was also one of the panel members and went on to explain that "*There was one industry panel who gave negative feedback. The student almost cried and yes that was the most critical. The panel consider his results to be useless, therefore, he thinks what he has been doing so far was worthless. That made him felt so down. The results were not wrong in reference to literature, but the outcome was just like that."*

Furthermore, the expertise of the panel members in the field was also believed to have an impact on students' presentation performance. Many students were reported to be anxious when presenting their URP results in front of these experts. One industry evaluator expressed his opinion with regard to this matter:

IP/M/2: Perhaps the students thought they will be scolded by this expert panel if they make any mistakes and thought that these panel members have high expectations on them.

The findings reveal that the presence of the panel of evaluators in the room has been perceived to have affected the students' level of confidence in giving effective presentations. The evaluators' responses, their negative feedback and their expertise were believed to create anxiety among the students.

4.6.3.3 URP presentation preparation

The panel of evaluators believes that proper preparation plays a big role in alleviating one's anxiety and eventually determining the smoothness of one's URPII final oral presentation.

For several industry evaluators, they felt that the main factor that distressed students in delivering their presentations was "*when the students are not well prepared*"(IP/M/5).

IP/M/5: *When they are not prepared, it shows in the organization of the slides. That reflects the person. Furthermore, the way they present and their dressing also give us an idea that they are not prepared.*

IP/M/1: *On first sight, the ones who are more prepared are less nervous.*

FL/M/2: When students do a lot of rehearsal that can make them less nervous. I believe it is through experience and more practice. For instance, when students are given the chance to speak up, speak in front of classmates, that could, in the future, reduce their anxiety levels.

On exposure in competition participation, one faculty lecturer (*FL/M/4)* admitted that *"We (faculty) did not give enough exposure to the students. In other places, students are encouraged to participate in competitions in which they have to present. Therefore, when it comes to URP presentations, they should have got used to presentations." (FL/M/4).* However, in terms of in-class training, he explained, "*from time to time, we always encourage students to practice before the real URP or Plant Design presentation. I train them in the classroom. I always encourage students to speak up and interact during in-class discussions. Even then, they still feel anxious in presenting, I believe that is a personal problem. We have created such a system to prevent students from being too anxious, but again it all depends on the person."(FL/M/4)*

However, many students are known to complete their work at the last minute, and as his colleague *(FL/M/4)* stated, *"many students do last minute work. Furthermore, students hardly have meetings with their supervisors. Those factors may affect their URP presentations because it is clear that they are not ready." (FL/M/4).* There were also students who have been observed to prepare the presentations with the aim of just to passing the course, as claimed by one industry personnel (IP/M/4).

When students are not well prepared, the smoothness of the presentation is usually affected. As one faculty lecturer observed:

FL/M/6: The slides are wordy, disorganized and speech is not related to the slide shown. Experiencing psychological disturbance causes the person to feel very anxious, disorganized and may cause them to depart from their previously planned strategy and lose focus.

In order to minimize the anxiety that students' experience, one faculty lecturer (*FL/M/6)* gave some useful tips. He said,

FL/M/6: To minimize the anxiousness, the important thing is to rehearse in front of a mirror or in front of the supervisor a week before the day of presentation.

The findings reveal the significance of spending adequate time to properly prepare for the URPII final oral presentations because with adequate preparation, the students are believed to experience less anxiety. Having few discussions with supervisors and not doing enough practice is eventually reflected in the ineffective delivery of their presentations.

4.6.3.4 Barriers in English language proficiency

Another important source of anxiety perceived by the panel of evaluators is the English language. As mentioned in the previous chapter, all URPII final oral presentations must be delivered in the English language, which is a second language to Malaysian students.

Even though different perspectives were sought from the evaluators on the ranking of English as the main factor, they agreed that English is one of the main sources of anxiety when the students have to deliver their URPII final oral presentations.

The evaluators expressed their opinions:

FL/M/1: To me, the first factor is English. If we were to let the students present in Bahasa Melayu, I think the style of their presentation would be different. Many aspects will be different, for instance, in terms of students' self-confidence, the smoothness from one sentence to another and the coherence of the topics discussed.

IP/M/3*: To me, English language is number two. The only setback of not mastering the language is when they want to argue, they do not know how to select appropriate word or phrase. Good English command is very important in delivering technical oral presentations because it reflects the quality of our presentations and being in technical field in Malaysia, you have no choice but to be good in English language.*

FL/M/4: Well, yes, in terms of language, students may find it difficult to pronounce some words or terms correctly. They are a bit shy and even scared if it is wrongly pronounced. This could be a factor that concerned them.

IP/F/6: *I believe poor command of English language is one of the sources of anxiety among these students.*

IP/M/7: The students experienced anxiety because it is a presentation in English.

Nevertheless, there were two industrial evaluators who commented on the students' proficiency in English language.

IP/M/5: From my observation, the students' English language proficiency has improved a lot.

IP/M/3: I would say that UMP students' English proficiency is moderate. I believe that with the standard of English that most students have currently, they will improve over time.

The findings reveal that students' proficiency in English language has also had an impact on students' level of anxiety as perceived by the panel of evaluators. No coherence in sentences formed, difficulty in choosing the best vocabulary to describe their project and to argue for their answers, as well as problems with correct English pronunciation are among the challenges that the students were observed to face. These difficulties affected the students' anxiety level and hence affected the smoothness of their presentations. However, students' level of English proficiency is seen as improving.

4.6.3.5 Presentation skills

In delivering effective presentations, certain techniques must be mastered by one presenter. From an industrial evaluator's (IP/M/1) point of view, having great and effective presentation skills can *"reduce the nervousness of the students."* (IP/M/1). In other words, not possessing good presentation skills is one of the factors that contribute to an increase in anxiety among students in presenting their URPII final oral presentations.

From the evaluators' observation, they found that some of the students did not have the following presentation skills:

IP/F/6: *Poor presentation skills and not enough experience in presentations cause students to experience anxiety above normal.*

IP/M/7: *Perhaps some of them have not really been exposed to methods of good presentation skills and they are not really interested in this field (presentation session).*

FL/M/1: Delivering technique is another factor. Sometimes, there was no coherence in the presentation and, in some cases, no proper conclusion made. That is what I observed. It was one of the major factors that interfere with the smoothness of the presentations.

IP/M/1: The students should possess body language skills during presentations.

IP/F/6: The slides were not well prepared.

The findings suggest that some UMP students fail to present their project results effectively because of the lack of presentation skills such as delivery technique, body language and slides preparation and organization. It was observed that poor presentations skills may create more anxiety in students and hence lead to ineffective presentations.

In summary, the panel of evaluators described their perceptions of the students' level of anxiety and the sources of anxiety that the students experienced. All evaluators agreed that most students exhibited symptoms of anxiety during their URPII final oral presentations. However, different opinions were apparent in terms of the students' level of anxiety. The majority of the industry evaluators found that only a minority of the students felt anxiety and most of the students were confident with their presentations. In contrast to the industry personnel's perspectives, faculty lecturers found that the standard of the students' presentations were deteriorating and most of the students were found to display anxious reactions during their presentations.

With regard to the symptoms of anxiety manifested by the students, most of the panel of evaluators observed several anxiety symptoms that were presumed to give negative impact to the students' URPII final oral presentation performance. In addition, several sources of anxiety which were perceived to adversely affect students' anxiety were also described by the panel of evaluators. Limited technical knowledge was perceived to be the main source of anxiety, followed by fear of the evaluators. In addition to that, lack of preparation is another factor that could also lead to anxiety among the students. Furthermore, students' low level of English proficiency was also identified as one of the main sources that exacerbate students' anxiety in delivering URP II final oral presentations in English.

4.7 Summary of the chapter

The findings from the quantitative analysis indicated the presence of a moderate oral communication apprehension level among most of the engineering students. However, the majority students are reported to be highly anxious in public speaking situations. The findings also revealed that most of the engineering students experienced moderately high and high levels of technical oral presentation anxiety. Furthermore, statistical analysis showed that there was a weak negative correlation between technical oral presentation anxiety and the students' scores in their URPII final oral presentations. Sources of anxiety among the students were investigated through interviews with the students and interviews with the panel of evaluators. Table 4.11 below illustrates the sources of anxiety perceived by the students and the panel of evaluators respectively:

Table 4.11: Sources of Anxiety Perceived by Students and Panel of Evaluators

Students	Panel of evaluators
Panel of evaluators	Limited technical knowledge
Barriers in students' English language	Panel of evaluators
Limited technical knowledge	Presentation preparation
Time constraints	Barriers in students' English language
Attitude towards oral presentations	Lack of presentation skills
Supervisor	

From the information in the table above, there are some similarities and differences found in the perceptions of the factors that influence students' anxiety in delivering URPII final oral presentations. An in-depth discussion and the interpretation of the findings will be discussed in the next chapter.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Introduction

This mixed-method case study investigated the anxiety experienced by engineering students in delivering technical oral presentations in English in the context of engineering education. Focusing on oral communication in English, this study documented and explored the presence of anxiety among engineering students, its effects on the students' technical oral presentation performance and the sources of anxiety.

This chapter presents the discussion of the results of the study with reference to past research and the theoretical foundations of this study. The discussion will be divided into two main sections. While the first section will discuss and interpret the statistical data, the findings from the interviews will be discussed and interpreted in the second section.

5.1 Quantitative Data

Table 5.1 below summarizes the descriptive findings of students' personal report on their oral communication apprehension in English and their anxiety in delivering technical oral presentations in English:

Table 5.1: Summary of the Results from Quantitative Data Analysis

Instruments	Analysis	Results
PRCA-24	• Cronbach Alpha • Descriptive	• A reliable questionnaire • Majority of the students felt highly anxious in public speaking • Majority of the students reported to be at moderate level of anxiety regarding oral communication in English
An adapted version of PRPSA-34	• Cronbach Alpha • Descriptive	• A reliable questionnaire • Majority of the students experienced high and moderately high level of anxiety in delivering technical oral presentations

Information in Table 5.1 shows that PRCA-24 quantitative data reported that chemical engineering students experienced moderate levels of anxiety in oral communication in English. Furthermore, data also showed that majority of these students felt highly anxious with regard to giving speeches in English in public. As UMP chemical engineering students must present a high-stake technical oral presentation at the end of their studies, an adapted version of PRPSA-34 questionnaire was distributed to these students with the aim of gathering statistical evidence and exploring whether these students experienced fear in presenting their technical or engineering knowledge in front of a set of audience.

Table 5.2 below compares the results for both public speaking anxiety (from PRCA-24 questionnaire) and technical oral presentation anxiety (from PRPSA-34 questionnaire). The data shows that the majority of students reported experiencing high levels of anxiety in public speaking as well as in delivering their technical oral presentations. The difference is only in the number of students who made the claim.

While there are 70 students (51.9%) claiming to be highly anxious in presenting speeches in public, only 63 students (46.7%) felt high and moderately high anxiety in delivering their URPII final oral presentations in front of the panel of evaluators.

Table 5.2: Comparison of Results between Public Speaking Anxiety and Technical Oral Presentation Anxiety.

Level of anxiety	PRCA-24	PRPSA-34
High	70 (51.9%)	27 (20.0%)
Moderately high	-	36 (26.7%)
Total	70 (51.9%)	63 (46.7)

From the findings, it could be interpreted that engineering students are more apprehensive in delivering public speeches in English than giving technical oral presentations in English. Even though there were only seven students who did not feel highly apprehensive in delivering technical oral presentations, the number is still significant. It is possible that these results are due to the students' high self-confidence and ability to talk about their knowledge in engineering subjects compared to general issues (which are common topics for public speaking). Furthermore, the fact that they have conducted a thorough study on their project for more than 12 months and that they also received useful feedback and guidance from their supervisors, may have contributed to their low anxiety in presenting their URP results in front of the panel of evaluators.

The next sub sections will interpret and discuss findings from the questionnaires separately.

5.1.1 Students' Technical Oral Presentation Anxiety

Oral presentations are part and parcel of classroom activities and assessments in engineering education contexts. Delivering an oral presentation requires similar skills to those required for speeches in public. Both communicative events demand certain vital skills such as efficient oral communication skills (i.e. highly proficient in the target language) and effective presentation skills.

Data from the adapted version of PRPSA-34 (Richmond & McCroskey, 1998) questionnaire reveal the level of technical oral presentation anxiety experienced among the students. It was found that a total of 63 students (46.7%) experienced high anxiety and moderately high anxiety in delivering URP presentations (see Table 4.3 for the full results of PRPSA-34). Additionally, 45.9% of the students experienced moderate anxiety and 7.4% of the students felt low and moderately low anxiety when presenting their URP projects. There are similarities in the results shown between the students' experience in delivering technical oral presentations and giving speeches in public (data from PRCA-24 questionnaire). The majority of students were reported to be highly anxious in engaging in both communicative events (see Table 5.2).

The findings of the current study do not, however, support the previous findings from research conducted by Elliot and Chong (2004). While slightly less than half of the students (46.7%) in this study felt highly anxious in delivering oral presentations, 70 % of the students in Elliot and Chong's (2004) study reported to have moderate level of presentation anxiety. Both studies utilized the PRPSA-34 questionnaire to measure students' anxiety level in delivering presentations. The difference found in the results of both studies could be due to the different samples

used in this study. In Elliot and Chong's (2004) study, the majority of respondents were native speakers of English and the presentations the students are required to deliver are in English (L1). In contrast to their study, students in this study must deliver their URP presentations in English which is, to them, a second language (L2) The anxiety experienced by the students in this study reiterates Kavaliauskienė's (2006) study with Lithuanian university students who had to present ESP presentations in English. It was reported that majority of the students (54%) felt fear in presenting ESP presentations in public. This could be interpreted that the medium of delivery in the presentation (English as a second/foreign language) has an effect on the students' self-confidence to some extent and this leads them to experience anxiousness. Clearly, the findings of this study corroborate with previous research on the effects of foreign language on students' speaking performance (MacIntyre & Gardner, 1994a, 1994b; MacIntyre & Gardner, 1991).

Similar findings were also reported by Tong (2009) where Vietnamese ESL students stated that they experienced anxiousness in presenting ESP presentations in public. However, the students in Tong's research were required to prepare ESP presentations in groups and results indicated that only 30% of 100 second year students felt anxious in delivering the presentations. On the other hand, in this study, the URP presentations are an individual task, where each of the students carried out the whole process from beginning to the end individually. This could be a potential reason why the majority of students in this study experienced high anxiety in presenting their results before an audience and to a panel of evaluators. Research found that individual presentations demand more effort and skills because the tendency to discover imperfections in solo presentations is higher (Ryan & Andrews, 2009). For example, in a research study carried out by Ryan and Andrews (2009) on

music performance anxiety in choral singers, the choral singers reported that solo performances were "more anxiety-inducing" (p. 118). Therefore, it can be interpreted that being a focus of attention can heighten students' anxiety.

In this study, a large proportion of students (46.7%) were reported to experience moderately high and high anxiety and less than 10% of the students had low and very low anxiety in presenting their URPII final oral presentations. These results are extremely surprising, bearing in mind that these students were final year students who have been exposed to a number of oral presentations throughout their studies in UMP, both in their engineering courses and ESP courses. Undoubtedly, most oral presentations conducted in the academic context are typically assessment in nature which is a demanding task for students (Kovač & Sirković, 2012; Garcia-Ros, 2011; Joughin, 2007). Garcia-Ros (2011) found that the students' high level of anxiety in giving oral presentations was not reduced, even though assessment rubrics were given before the assessment. The respondents in Joughin's (2007) study perceived oral presentations as a rich form of assessment, which required presenters to put in more effort and demanded a deeper understanding of the subject matter. These demanding tasks may explain the high anxiety levels that most engineering students experienced especially when their fate rests on passing URPII final oral presentation assessment as the results determine their graduation. It can be implied that these students' level of anxiety could be affected by the high stake assessment. These findings further support the proposition that high stake assessments may aggravate students' anxiousness and hence would negatively impact their performance (Chapell et al., 2005; Sarason, 1984).

5.1.2 Students' Levels of Oral Communication Apprehension

Oral presentation is often discussed in relation to oral communication apprehension. This is because oral presentation requires a certain level of confidence in communicating in order to complete a verbal task effectively. Realizing the importance of oral communication in students' technical oral presentations, it is vital to explore students' perceptions of their oral communication in English. Prior to answering McCroskey's (1982a) PRCA-24 questionnaire, the respondents were informed and reminded that all items in the questionnaire are about communication in the English language, not in other languages. The current study demonstrates that majority of these ESL learners reported that they had moderate oral communication apprehension in English. This finding is in agreement with findings from other research studies (Wan Zumusni Wan Mustapha et al., 2010; Rojo-Laurilla, 2007). Rojo-Laurilla (2007) posited that her respondents, who were Philippino maritime students, may have developed positive attitudes towards the English language throughout their course of study which explained why they were quite confident in communicating in English. Similarly, the engineering students in this study who have been in the programme for four years in UMP have had sufficient exposure to English language inside and outside of engineering and non-engineering classrooms. Even though English is not the medium of instruction in UMP, the use of English language is highly encouraged and it is widely used among students and academic staff. Furthermore, as part of the internationalization activities in the university, more and more international students and international academic staff are being recruited. Hence, the use of English on UMP campus is becoming more commonplace. According to a study carried out by Magno et al. (2009), one's level of language proficiency may be improved by the amount of his/ her exposure to the target

language. The exposure to the English language throughout their years of studies in UMP may also create a positive attitude towards the language and could explain why majority of the students in this study experienced moderate oral communication apprehension in English.

Research has found that high-context cultures will produce higher levels of oral communication apprehension (Matsuoka, 2008; Pryor, Butler & Boehringer, 2005). According to Pryor, Butler and Boehringer (2005, p. 248), oral communication in this high-context culture setting is "implicit and indirect, with high levels of caution and less talk". Many Asian countries, such as Japan and Malaysia, have a high-context culture setting. In her research study, Matsuoka (2008, p. 44-45) found that "East Asian learners, including Japanese ones, may harbour a high degree of communication apprehension in any L2, being sensitive to judgement by others". Similarly, a high-context culture setting like Malaysia may account for students feeling highly anxious when communicating orally in English. However, the findings of this study did not support the generalization made. Even though Malaysia is a high-context society, the majority of Malaysian engineering students in this study were reported to experience a moderate level of oral communication apprehension in English, which could be due to the status of English language use in Malaysia. Unlike Japan, English is a second language in Malaysia and in the Malaysian educational context, English is taught formally and systematically in schools from Primary One to Secondary Five. The formal English language exposure they have had for 11 years in school may have contributed to the students feeling less apprehensive in communicating orally in English. Furthermore, in Malaysia, there is an abundance of English reading materials and sources such as books, magazines, newspapers and English language television programmes from the United States, the

United Kingdom and Australia. With such varied sources so widely available, most students can be expected to be quite confident in their English communication.

Even though the findings of this study are similar to studies carried out by Wan Zumusni Wan Mustapha et al. (2010) and Rojo-Laurilla (2007), they are different from the findings of a study carried out by Khan, Ejaz and Azmi (2009). They conducted a research study on oral communication apprehension on final year pharmacy students in one Malaysian public university. They found that majority of the final year pharmacy students experienced high oral communication apprehension. One possible reason given for the pharmacy students' high oral communication apprehension is their quiet and anti-social attitude. It was reported in the study that Pharmacy students were not actively involved in extra-curricular activities organized by the university unlike students from other faculties who were actively involved in those activities. However, Yeung, Read and Schmid (2005) found that most chemical engineering students in the University of Sydney had introvert personalities and preferred working individually and internally (Felder, Felder & Dietz, 2002) . It needs to be pointed out that the present study did not investigate engineering students' personalities. Felder, Felder and Dietz (2002) posited that learners with extrovert personality types prefer activities which involve interaction with other people, which could perhaps explain why chemical engineering students in this study only felt moderate anxiety in communicating orally with other people. Nevertheless, future research to determine chemical engineering students' personality types should be conducted to empirically verify the above assumption.

Compared to other communication contexts in the PRCA-24 questionnaire such as group discussions, meetings and dyads, the public speaking communication context received the highest score for high level of apprehension. This suggests that

majority of the students in this study fear public speaking more than other speech events such as interpersonal conversations, meetings and group discussions. This finding seems to be consistent with findings from other research studies (Byrne, Flood, & Shanahan, 2009; Honeycutt, Choi, & DeBerry, 2009; Francis & Millers, 2008) which found that delivering speeches in public create high apprehension among college students, regardless of their academic majors, whether in business; accounting; communication or engineering. One possible explanation for high apprehension in public speaking is the number of people involved in the communicative setting. Unlike public speaking, the other communicative settings (such as interpersonal conversations, group discussions and meetings) involve more than one person to work but public speaking normally is a one-man show, where full attention is given solely to the speaker. This could explain why many students experience a high level of apprehension in giving a speech in public but are more comfortable in engaging in other communication settings such as group discussions, interpersonal communication and meetings.

According to Francis and Miller (2008), people involved in public speaking perceive their experience in terms of performance and communication. Motley (1997, p. 380) defines public speaking from a performance perspective as "a situation demanding special delivery techniques in order to impress an audience aesthetically", while from a communication perspective, it is defined as "a situation calling for one's ordinary everyday communication behaviours in an effort to reach audience members with respect to the topic and information of the speech". Research found that students are better able to cope with public speaking apprehension by viewing public speaking as a commonplace communication behaviour (conversation) instead of a performance. Therefore, students who were reported to experience public

speaking apprehension must be helped to change their perceptions with regard to public speaking.

In summary, it is reasonable to contend that this study has contributed to enhancing understanding of the educators regarding oral communication apprehension in English among engineering students.

5.1.3 The Relationship between Students' Technical Oral Presentation Anxiety Levels and Technical Oral Presentation Performance

Table 5.3 below provides a summary of the findings relating to the relationship between students' levels of anxiety in technical oral presentations and their URPII final oral presentation score:

Table 5.3: Summary of Correlation Analysis between PRPSA-34 Score and URPII Final Oral Presentation Score

Instruments	Analysis	Results
An adapted version of PRPSA-34 and URPII final oral presentation score	Pearson Product-Moment Correlation Coefficient	There is a weak negative correlation between engineering students' level of technical oral presentation anxiety and URPII final oral presentation score.

To measure the strength and direction of linear relationship between two continuous variables (Pallant, 2005), the students' technical oral presentation anxiety (as measured by an adapted version of Personal Report of Public Speaking Anxiety (PRPSA-34 (Richmond & McCroskey, 1998) questionnaire) and Undergraduate Research Project score (as measured by URPII final oral presentation score), Pearson product-moment correlation coefficient was applied. The results found a very weak negative correlation between the students' technical oral presentation anxiety levels

and their technical oral presentation score. There is no adequate evidence to show that students' level of anxiety is correlated to their TOP scores. The results of coefficient determination with R^2 value is 0.002 or 2% which means the Predictive power of technical oral presentation anxiety for TOP score is only 2%. It can be interpreted that the low marks that the students' acquire in URPII final oral presentation assessment probably is not caused by presentation anxiety only. There could be other factors that influence the students' TOP performance.

Generally, the results of this study that shows the negative relationship between severity of anxiety and oral performance agrees with that which has been reported in a number of previous research studies among second language learners (Neff, 2007; Park & Lee, 2005; Brown & Morrissey, 2004; Cheng, Horwitz & Schallert, 1999; MacIntyre & Gardner, 1994b; Phillips, 1992; Horwitz et al., 1986). However, most research studies found a strong negative relationship between the anxiety levels and ESL students' oral performance. The present study result supports Woodrow's (2006) findings on the relationship between anxiety and L2 oral performance. Woodrow posited that the negative and weak correlation found between anxiety and oral performance is comprehensible because anxiety is only one of many factors affecting effective oral communication. However, the result still implies the influence of anxiety on students' oral performance.

In this study, students' anxiety levels have no significant impact on students' presentation grade. This interesting result may support the proposition that anxiety can be facilitating and less debilitating to the person. In this study, it seems clear that these engineering students were experiencing facilitating anxiety. Data revealed that although majority of the students experienced high anxiety in delivering presentations, they still scored high marks in their presentations. Table 5.4 below

summarizes the students' scores in the URPII final oral presentation assessment. The information in Table 5.4 shows that majority (56.3%) of the students' URPII final oral presentation scores were within 80 to 100 %, which were considered very high.

Table 5.4 : Summary of students' URPII final oral presentation scores

Score (%)	Number of students
80-100	76 (56.3%)
60-79	58 (43%)
40-59	1 (0.7%)
Total	135 (100%)

This confounding result is contrasted with a research study carried out by El-Anzi (2005) which found that experiencing low degrees of anxiety may improve one's academic achievement. In this study however, it seems clear that the high anxiety that the students experienced helped them to be more focused on the presentations, so enhancing their performance. This interesting finding supports the assumption put forward in the Processing Efficiency Theory (PET) (Eysenck & Calvo, 1992) which suggests the presence of high level of anxiety in students may motivate them to put in extra effort and time for presentation preparation to improve their performance.

This finding also substantiates MacIntyre, Noels and Clement's (1997) proposition that students with high anxiety levels may misjudge their potential and abilities in achieving good grades. A study by Norton and Hope (2001) found that most people with high anxiety are normally unsatisfied with their performance because of their high expectations about their own performance. In fact, the high anxiety respondents were found to have negative perceptions of themselves by exaggerating their poor performance. Self-rating on anxiety was significantly higher than observer's rating score on anxiety in giving speeches. Results from the adapted

version of PRPSA-34 questionnaire shows that the students in the present study were reported to be highly anxious in delivering their technical oral presentations and the panel of evaluators agreed that these students were observed to appear anxious during the presentations.

5.1.4 Summary

The present study confirms previous findings and contributes additional evidence that suggests technical oral presentation and oral communication apprehension is present and prevalent among ESL learners. The findings also suggest that students felt high levels of anxiety in public speaking as well as in technical oral presentation. It appears that the topic of presentation, whether it is a general topic or an engineering topic, makes no difference to these students in feeling highly apprehensive in delivering the presentations. Future researchers may carry out systematic investigation on the extent the topic of presentation affects students' anxiety in oral presentation.

The other major finding is the role of technical oral presentation anxiety as a facilitating anxiety. The results from the statistical analysis show a weak negative relationship between technical oral presentation anxiety and students' URPII final oral presentation scores. This suggests the higher the level of anxiety, the lower the score is. However, the students in this study scored high marks in their URPII final oral presentations. It is interesting to note that the feeling of anxiety experienced by the students helps them in making adequate preparation, performing good presentations, thus receiving high marks.

The feeling of anxiety among the chemical engineering students in delivering technical oral presentations is evident from the data yielded from the questionnaires.

The present study also investigated the factors that contributed to the feelings of anxiety among the students to better understand the issue. The sources of anxiety as perceived by the students will be discussed and triangulated with the findings from the evaluators' interviews. The discussion and interpretation of the findings will be reviewed in the next section.

5.2 Qualitative Findings

Focus group interviews were conducted with selected final year chemical engineering students to gather their perspectives on what factors affected the students' level of anxiousness in delivering their URPII final oral presentations. To triangulate the findings from the students' interviews, interviews with the panel of evaluators comprising the faculty lecturers and industry personnel were also conducted. The evaluators' comments were based on their observations during the URP supervision (faculty lecturers only) and the URPII final oral presentation assessment (the faculty lecturers and industry personnel).

In the interviews, various perceptions were put forward by the evaluators when asked about students' anxiety as a whole. Some evaluators noticed the anxiousness experienced by students through anxiety symptoms manifested by the students. The physical symptoms observed were avoiding eye contact with the evaluators, scratching their heads and trembling hands. Nevertheless, one faculty lecturer and several industry personnel claimed that students nowadays have higher self confidence in delivering oral presentations. Another faculty lecturer felt that students' anxiety level was high at the beginning of the presentation but after several minutes of the presentation, most students would feel more confident in presenting their findings to the evaluators.

5.2.1 Sources of anxiety

Perceptions from students and the panel of evaluators of the students' sources of anxiety were drawn from the interviews conducted. Table 5.5 below presents the sources of anxiety as perceived by the students and the panel of evaluators:

Table 5.5: Sources of Anxiety Perceived by Students and Panel of Evaluators

Students	Panel of evaluators
• Panel of evaluators • Barriers in students' English language • Limited technical knowledge • Time constraint • Attitudes towards oral presentations • Supervisor	• Limited technical knowledge • Panel of evaluators • Presentation preparation • Barriers in students' English language • Lack of presentation skills

The sources of anxiety mentioned by the students in the focus group interviews include the panel of evaluators, barriers in students' English language, the URP results, time constraints, attitudes towards oral presentation and unhelpful supervisors. Besides limited technical knowledge, the panel of evaluators and barriers in students' English language, the evaluators also pointed out presentation preparation and lack of presentation skills as among the sources of anxiety experienced by the students.

It is shown that the sources of anxiety perceived by the students and the panel of evaluators differ slightly but, to a certain extent, showed some similarities. The evaluators believed that the lack of presentation skills among the students is one of the main sources of anxiety but none of the students perceived that as a factor that contributed to their anxiety level.

Furthermore, the differences can be identified in terms of the significance of the sources in inducing the feeling of anxiety among students. For instance, many students perceived evaluators to be the most significant source in aggravating their anxiety, followed by the students' low English proficiency and limited technical knowledge. In evaluators' point of views, students' limited technical knowledge was recognized to be the main source of anxiety, followed by the panel of evaluators and the students' preparation for the presentations. However, there are similarities in the sources of anxiety perceived by the two groups; for instance, both groups perceived sources such as the panel of evaluators; English language barriers and limited technical knowledge to have an impact on the students' level of anxiety in presenting URPII final oral presentations to a certain extent.

Generally, several research studies conducted almost similar studies on ESP presentations (Yang, 2010; Tong, 2009; Kavaliauskienė, 2006). Nevertheless, these studies did not investigate the sources of anxiety as their focus areas were on the challenges and hindrances in delivering ESP presentations effectively. In research studies carried out by Tong (2009) and Kavaliauskienė (2006) for instance, the students did not deliver any presentations but they were only asked to think or foresee the challenges that they might face in delivering ESP presentations (anticipated presentations). In the present study, students' responses to the questionnaires and in the interviews were based on their own personal engagement and actual experience in delivering technical oral presentations. In a similar study, the students in a study conducted by Yang (2010) were required to deliver ESP presentations in groups, while in the present study, the presentations were conducted individually.

Tong (2009) reported that the hindrances encountered by his Vietnamese students in delivering effective ESP presentations were expressing presentation content, organizing selected information, finding large amount of ESP vocabulary in materials, selecting topics, selecting presentation forms, selecting visual aids, selecting roles of group members, lacking the time to rehearse, lacking concentration and presentation skills. Unlike the findings in a research study conducted by Tong (2009), the students in this study did not face difficulties in many of the problems listed above. However, some similarities were observed where students in both studies were reported to face time constraints and lack of presentation skills. In this study, the engineering students stated time constraints as one of the sources for their anxiety in delivering URP presentations and the panel of evaluators pointed out that students' anxiousness was attributed to their lack of presentation skills. Nevertheless, the findings from Tong's study only listed the challenges faced by the students in delivering ESP presentations and the challenges found may not be attributive factors for their anxiety. Furthermore, Tong did not investigate ESP presentations in relation to anxiety.

The next section will discuss the sources of anxiety in relation to the perceptions of both students and the panel of evaluators. The discussion of the findings below starts with the sources found to be similar in both groups (i.e. the panel of evaluators, barriers in students' English language and limited technical knowledge), followed by the other sources of anxiety (i.e. presentation preparation, time limitation, lack of presentation skills, negative attitude and supervisor factor).

5.2.1.1 Fear of the Evaluators

The first source of technical oral presentation anxiety that both students and evaluators mentioned in the interview sessions was the panel of evaluators.

Majority of the students interviewed stated that the audience, especially the panel of evaluators, intensified their level of anxiety in presenting their URPII final oral presentations. Similarly, the evaluators also found that the presence of the evaluators during the presentation affected the students' self-esteem and confidence level to some extent. This finding concurs with other studies where the presence of the audience heightened their level of anxiety in giving a good performance (Southcott & Simmonds, 2008; Fehm & Schmidt, 2006; Kavaliauskienė, 2006). Southcott and Simmonds (2008) further explained that the audience could comprise the judges or even the peers. In their study with music students, it was reported that these students experienced more performance anxiety in an assessment situation. This is very similar to the present study whereby the URPII final oral presentations were assessed and given marks by the panel of evaluators based on specific criteria listed by the faculty.

The panel of evaluators involved in the URPII final oral presentations comprised faculty lecturers and representatives from chemical-related industries around Malaysia. Their expertise in the field is reported to be one of the main factors that heightened the students' levels of anxiety. The students claimed that even just the thought of the panel made them nervous, by thinking of the knowledge and expertise they held in that field. Comparable findings were reported in a study conducted by Fehm and Schmidt (2006) on performance anxiety among German gifted adolescent musicians. It was reported that the presence of teachers and professors caused most of the musicians (58.1%) to develop high levels of

performance anxiety. The attributable factors were the teachers and professors' professional knowledge (36.5%) and the high value of their judgment (32.7%).

Most students are found to have negative perceptions of their evaluators. They claimed that some evaluators prefer condemning their projects by pointing out the weaknesses of the project, rather than sharing their expertise and giving opinions on how to improve the research project. Data from interviews indicated that negative responses given by the panel had also generated anxiety among students. Some students claimed that angry facial expressions shown by the evaluators intensified the degree of their anxiety. The present findings seem to be consistent with the findings yielded in a study by Wieser, Pauli, Reicherts and Mühlberger (2010) that suggest angry facial expressions may be the most appalling factor that influences public speech anxiety because they indicate assessment and disapproval. Similar findings were reported in a study by Ryan and Andrews (2009) on choral singers' performance anxiety. They reported that conductors' characteristics or behavior increases the students' performance anxiety. The conductor's role in music is similar to evaluators' role in students' presentations because their response matters. Negative body language in particular and lack of eye contact made, were reported to be among responses given by the conductors which negatively affected the singers' confidence. Similarly, the present study also found that harsh evaluators negatively impacted on students' self-confidence.

Being a responsive audience, the evaluators did pose questions to the students for clarification on certain issues. Most of the students stated that even before the night of presentations, they felt anxious in thinking of the questions that may be posed to them. Some students reported experiencing mind blanks during the presentation session due to some unexpected questions posed by the panel. This

could be attributed to their lack of knowledge on the subject matter and their low proficiency of English. This supports the findings by Yang (2010). It was reported that the ESL students in his study were not confident in answering unexpected questions posed to them due to their low proficiency in the English language. This accords with the findings of related research studies (Zappa-Hollman, 2007; Ferris, 1998) that posited ESL students were found to be not ready to answer questions spontaneously in the target language. Due to that problem, students in Yang's study strategized by preparing and designing presentations which take almost all the allocated time. Therefore, the question and answer session was left with no more than 5 minutes which means less questions could be posed within that limited time.

With regard to evaluators' feedback, both students and the panel of evaluators highlighted the high impact of negative feedback especially in exaggerating their anxiety level and so affecting their overall presentation performance. This finding is similar to Kavaliauskienė's (2006) study who claimed that some students felt anxious in listening and receiving teacher's feedback because unpleasant and negative comments could have affected learners' level of self-confidence. Sharp (1996) suggested feedbacks to be given following "sandwich principle": positive, negative, positive (p. 996). The evaluators are advised to point out the strenghts of the project, followed by the weaknesses and conclude with more positive comments. The application of the sandwich principle in giving feedback to students is believed to produce great reward.

Some evaluators were eager to give feedback and pose questions to the students but forgot to do it during the question and answer session. Due to that, some students in the present study asserted that interruptions made by the panel during their presentations (whether to ask questions or ask for clarifications about their

presentations) had caused their anxiety to heighten. This supports the findings to a study conducted by Worde (2003), who found that comments by the teachers on their errors committed during speaking really disturbed and frustrated the students because they tend to forget their points following the interruption. Some students in this present study did voice their feeling of being uncomfortable with the interruptions. Even the panel of evaluators proposed that fewer interruptions must take place during the students' presentations, realizing that interruptions may create more anxiety in the students. When prompted during the focus group interview sessions, many students preferred to have questions asked during the questions and answer session. This is because the interruptions during their presentations would not only disturb the focus and aggravate their feelings of anxiety but they would also take several minutes of their allocated presentation time.

5.2.1.2 Barriers in Students' English Language Proficiency

Barriers in students' English language proficiency is another major source of anxiety in delivering URPII final oral presentations as stated by almost all students and most of the panel of evaluators in the interviews conducted. Most of the evaluators believed that the students were anxious to deliver the presentations because it was an English presentation. Several weaknesses were pointed out by both the students and the evaluators with regard to problems that students face in English language, such as limited English vocabulary, wrong word pronunciation and the negative influence of the mother tongue on English language. This finding is in line with outcomes reported by other researchers who investigated the use of English as a second/ foreign language in oral tasks (Kovač & Sirković, 2012; Zareva, 2011; Bankowski, 2010; Yang, 2010; Neff, 2007; Zappa-Hollman, 2007). For example, Kovač and Sirković (2012) discovered that ESL learners had the tendency to make

morphological and lexical errors in speech tasks which were due to their limited English proficiency. ESL students in Yang's (2010) study expressed their difficulties in expressing their ideas clearly during presentations due to their lack of ability in speaking English. The findings of the current study are also consistent with those of Zappa-Hollman's (2007) study which reported that limited English proficiency constrained the students from expressing and clarifying messages effectively and this inability caused them to experience high levels of anxiety during their academic presentation's preparation and delivery. In addition, the findings in this study also support Zareva's (2011, p. 6) claim that "presentation skills become more pressing an issue when English as a second language (ESL) is used" because communicating in L2 can "result in apprehension, emotional and even physical reactions" (Baralt & Gurzynski-Weiss, 2011, p. 202). On the same note, Kovač and Sirković (2012) and Weissberg (1993) also observed that L2 students have the contention that delivering a presentation effectively demands language mastering. The analysis of the students' comments during the focus group interview sessions in the present study concluded that most students admitted their low level of English proficiency and had insufficient English vocabulary. This problem heightened their feelings of anxiety in delivering their URPII final oral presentations in English because the difficulties in conveying their message across effectively could have affected their presentation performance. A research study has shown that anxiety has a significant impact on students' presentation score (Neff, 2007). In the present study, as observed by the evaluation panels, some students with low English proficiency were reading and relying more on their slides prepared during their presentations. Only some students were observed to explain their points freely. Similar observations were pointed out by engineering professors on the difficulties faced by ESL students in their

engineering classroom (Ferris & Tagg, 1996). It was found that ESL learners with low English proficiency were reluctant to be involved in class interaction and they were advised to practise speaking skills by involving themselves in speaking activities such as oral presentations.

The evaluators in the present study believed that the students' presentation performance will be better if the presentations were conducted in Bahasa Melayu, which is the first language to most of the student respondents. However, one industry evaluator emphasized that engineers must possess a certain standard of English proficiency to be successful in the technical field.

5.2.1.3 Limited Technical Knowledge

Many students highlighted that having limited knowledge about their URP project had contributed to their anxiety in delivering URPII final oral presentations effectively. Similar perceptions were given by the panel of evaluators during the interviews. Many students claimed that their nervousness was attributed to their incomplete experiments, technical glitches and methodology problems.

It can be gathered that the definition of limited technical knowledge as perceived by students and the panel of evaluators was different. From the students' explanation about technical knowledge in the focus group interviews, it basically refers to their URP results which to them mean the experiment output and the preciseness of the results. In contrast to students' definition, the evaluators viewed technical knowledge to refer not only to the results of the project but also the knowledge of the project in general. It involves the theory underpinning the research as well as the application of the research into the real world. Most evaluators pointed out that many students did not possess an in-depth knowledge on the subject matter

and that reason may lead them to experience anxiety in their URPII final oral presentation assessment.

The findings of the present study concur with a study carried out by Prima Vitasari et al. (2010) which reported that many students felt anxious in taking examinations. In her study with 770 students of Universiti Malaysia Pahang (UMP), she found that one of the factors that contributed to students' study anxiety was their lack of preparation for examinations. Lack of preparation in this present study can be defined as students' failure in completing their URP projects successfully (due to various reasons) and having less knowledge about their projects. Examination in Prima Vitasari et al.'s study refers to written final examination but in this study, it refers to the technical oral presentation assessment.

In preparing technical oral presentations in engineering education, students are expected to use "result-oriented" structure because the value of an engineering project is on the results and not on the process (Dannels, 2002). Dannels (2002) in her study with mechanical engineering students who were working on design presentation found that evaluators are more interested in the results. Therefore, it is anticipated that chemical engineering students in this present study were aware of this important fact. Having no results or not having the results expected had aggravated their anxiety in presenting their results to the panel of evaluators. To counter this problem, the evaluators suggested the students to do more extensive reading on the topic researched. Generally, it is strongly believed that having enough knowledge of the subject matter could help decrease the students' level of anxiety.

5.2.1.4 Lack of Presentation Skills

Some evaluators observed the lack of presentation skills among the students may have negatively impacted on the students' level of anxiety, but none of the student interviewees mentioned about worries about their presentation skills and their feeling of anxiety in the presentations. This could be interpreted that students may not be aware of the importance of presentation skills, but they are more anxious about the content of their presentations (that is, their URP results). However, the students were observed by the evaluators to be deficient in their presentation skills which require using appropriate body language and having good slides organization. This accords with the findings of most research studies on ESL students' presentation skills (Kim, 2006; Palmer & Slavin, 2003; Ferris & Tagg, 1996). A research study conducted by Ferris and Tagg (1996) which sought the opinions of college/ university content-area professors on ESL students' speaking abilities in communicative activities in classrooms reported that ESL students lack formal presentation skills. For example, the engineering professors surveyed were concerned with ESL students' inability to respond adequately to questions posed during formal oral presentations. It was interpreted that it was due to the difficulties in their oral fluency and accuracy in the target language. This problem had also caused them to be less interactive in the classrooms.

When the students in the present study did not bring up the issue of presentation skills deficiency as one of the factors for their anxiety, it indicates that they may feel well equipped with the skills. Furthermore, they have been exposed to the teaching of presentation skills since their first semester in the university and they have been delivering quite a number of oral presentations since then. Nevertheless, the presentation skills taught in Technical English course (the first level) were

general skills required for general oral presentations and not for technical oral presentations. In delivering technical oral presentations in engineering education, with different types of information, expectations, requirements and groups of audience, more specific presentation competencies are needed for specific purposes and goals. Dannels (2002), an expert in communication across curriculum (CXC), conducted a study on design presentations in the mechanical engineering context. She found that there are five important oral presentation competencies that students must acquire in order for them to "speak like an engineer" (p. 259). The specific skills listed are "simplicity, persuasiveness, results-oriented, numerically-rich and visually sophisticated" (p. 257).

Besides the specific presentation skills needed, one industry personnel suggested that adequate exposure to effective presentations should be given to students. He strongly believed that students will gain a lot of benefits from observing excellent presentations, especially in learning specific skills and strategies in delivering effective presentations. This experience could help students develop their presentation skills and improve their presentation performance.

In summary, improving the level of preparedness through the presentation skills enhancement of the engineering students and adequate exposure may benefit them to experience less anxiety in delivering technical oral presentations.

5.2.1.5 Time Constraints and Preparation for Presentation

This section will discuss the factor of time constraints in relation to lack of preparation for the presentations. These factors were also perceived to have a negative influence on a student's anxiety level in delivering URPII final oral presentations.

Given only 15 minutes for one presentation, many students faced time constraints to present their URP project. The limited time allowed has affected students' level of anxiety in delivering their URPII final oral presentations. Many were worried that the time did not permit them to present all the results obtained from their experiments and if their presentations exceeded or were below the allocated time, it would affect their marks.

Some students in the present study complained of the limited time given for their presentation. The time allocation of 15 minutes was considered too short and inadequate for presenting their URP results in front of the evaluators. Furthermore, the fact that time is, itself, one of the evaluation criteria in URPII final oral presentation assessment led them to feel more anxious in the presentation. With regard to time constraints faced by the students, panel of evaluators believed that with enough preparation and proper rehearsals, the presentation will fit the time frame adequately and the problem of time constraints will not emerge. This finding is in agreement with the findings from research studies conducted by Kovač and Sirković (2012) and Francis and Miller (2008) which noted preparation and practice as effective ways to alleviate students' anxiety in various oral communication contexts especially in public speeches. Francis and Miller (2008) posited that during the preparation time, students can decide what important content should be delivered in the oral presentation. The strategy of presenting only significant results may help the students to manage the presentation time more effectively. This strategy may also solve the student's problem of having "too much information to be shared" (G2/4/M) in a limited time and improving their slides preparation.

Since time is one of the constraints, one faculty lecturer also suggested students to rehearse in front of a mirror or the supervisor one week before the

assessment date. It indicates that rehearsing can improve one's presentation performance, as in the phrase "practice makes perfect". This finding further supports the proposition made by a number of researchers (Kovač & Sirković, 2012; Yang, 2010; Francis & Miller, 2008; Zappa-Hollman, 2007; Kobayashi, 2003; Morita, 2000) that having several practice sessions and proper guidance from teachers may facilitate one's improvement in oral presentations and thus help alleviate the students' fear in the presentations.

The strategies of adequate preparation and proper rehearsals may ensure that all important results will be delivered effectively and the time allocation for presentations is sufficient. These strategies are also postulated to be effective in improving students' oral communication in general and so enhance their self-confidence.

5.2.1.6 Attitudes Towards Technical Oral Presentations

This section discusses students' having low confidence in delivering effective URPII final oral presentations. This study found that students hold negative thoughts about themselves and criticisms of their weaknesses in relation to giving oral presentations. Descriptions such as having low self-esteem and low self-confidence, feeling of high anxiety, fearing facing public and suffering blank mind indicates the negative attitudes towards the technical oral presentations. This finding is similar to a research study carried out by Phillips (1992) with students who learned French as second language. They were reported to have negative attitude towards oral examination conducted. Some of them expressed feelings such as being 'blank', 'feeling panicky', 'confuse' and 'dumb' when explaining about the oral examination. The finding in the present study that shows the way these students construe their

ability is evident (triangulated) in the data yielded from the PRPSA-34 questionnaire which shows that most students felt high anxiety and moderately high anxiety in delivering technical oral presentations.

In relation to Social Cognitive Theory by Bandura (1986), the concept of self-perception can be linked to self-efficacy, the key component of this theory. Self-efficacy is defined as a person's confidence in his/ her ability to perform a task (Bandura, 1986). It is claimed that when one's self-efficacy increases, the performance will increase too and vice versa. The finding of the present study, however, does not support Bandura's theory on the positive relationship between self-efficacy and one's performance. It was reported that even though students may have negative attitude towards the presentations, the marks received for their URPII final oral presentations are still considered high. Most of the students who raised the subject matter (during the interviews) scored between 16 to 20 marks which is 60 to 80 %, and one student received above 20 marks which is above 80 % for their URPII final oral presentation assessment (refer to Table 4.9 for students URPII final oral presentation full marks). It is difficult to explain this finding, but it could be presumed low self-confidence was not translated into negative actions or behaviour. Instead, it seems that it has developed positive self-awareness which pushes them to put into more effort through proper preparation to attain high performance in the presentations. This may indicate that this type of anxiety that was attributed to their low self-esteem is in fact a facilitating anxiety. The finding may also signify the students' high expectations placed on themselves that caused them to have low self-confidence. Perhaps the students strongly believed that they could have performed better in their presentations.

5.2.1.7 Supervisor Support

Remarks on the roles of the supervisors were only made by the students, and none of these comments arose from the evaluators. For students who conduct projects, supervisor's role is highly significant as the expert in the subject matter. Furthermore, supervisors are the closest source of reference for the students' projects and they are expected to provide various forms of support, resources and opportunities to the trainees (Hussain, 2011; Chiaburu, Dam & Hutchins, 2010). Even though the research studies carried out by Hussain (2011) and Chiaburu, Dam and Hutchins (2010) are related to supervision training in the workplace, the role of supervisors in both education and workplace contexts are similar. Chiaburu, Dam and Hutchins (2010) conducted a longitudinal study in a large corporate institution on training and social support in a workplace and found that having a quality relationship with one's supervisor positively influence a trainee's motivation and self-confidence. However, the finding from the present study exemplifies some unhealthy relationships between the supervisor and the students. Some supervisors were reported to be unsupportive, irresponsible and highly demanding which was a disappointment for the students. Without proper support and guidance from the supervisor, the students who were novices in conducting a technical project were reported to develop feelings of anxiety when they had to present their URP results in front of the evaluators. Furthermore, the fact that the presentation is a form of an assessment, it further aggravates their anxiety.

In the interviews with the faculty lecturers who are also URP supervisors, none of them discussed the relationship with their supervisees as one of the sources for students' anxiety. A possible explanation for this might be that the supervisors

believed that they had given supportive supervision to their supervisees and were probably not well aware of the problems faced by their supervisees.

In this context, supervisors should be more sensitive to the learning needs of their students and become good mentors to the students particularly at any critical stage of the project conducted. It must be pointed out that a supervisor's endorsement and validation of a student's work and his or her progress in the project, the project results for example, plays a vital role for the student to be highly confident with the work done on his/ her project. It must be highlighted that being proficient in English is important for effective presentation delivery but having correct results or at least affirmation that the project is sound can be a tremendous boost on the student's confidence. It can be deduced that an excellent supervision has great influence on a student's anxiety level and is very significant in helping students to be highly confident in the technical oral presentation. After all, the element that is given more emphasis in technical oral presentations is the technical knowledge that the students' possess. However, the factors for students' technical oral presentation anxiety are all interrelated.

5.3 Summary of the chapter

This chapter presented the discussion of the findings in relation to past research studies. In general, the study revealed students' anxiety levels in delivering technical oral presentations and the levels of their oral communication apprehension in English. A negative but weak relationship was found between students' level of presentation anxiety and students' performance in presentation. This indicates that students' performance in URPII final oral presentations is not significantly affected by their anxiety. Evidence from student questionnaires, student and evaluators'

interviews also support the claim suggesting that anxiety is present among the chemical engineering students and it may have positively influenced the students' technical oral presentation performance.

The present study was also designed to determine the sources of anxiety which were believed to have affected their anxiety level in delivering URPII final oral presentations. Some similarities and differences were identified in the sources of anxiety as perceived by the students and the panel of evaluators which has been discussed thoroughly in this chapter.

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CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This study examined the issue of technical oral presentation anxiety among engineering students in delivering URPII final oral presentations. The data and findings were obtained from the distribution of questionnaires to students, interviews with the students and the panel of evaluators and analysis of official documents. This chapter concludes and summarizes the findings from this study based on the findings and data collected. Later, the pedagogical implications are discussed in detail and recommendations for future research are put forward.

6.1 Main Findings

The discussion of main findings will begin with results from the quantitative analysis, and will be followed by data from the qualitative analysis.

This study is significant in that it provides concrete evidence of the presence of anxiety among engineering students in communicating in English orally and in delivering technical oral presentations in English. Even though the majority of the students felt moderately anxious about oral communication in English, most students (66.7%) experienced high anxiety in public speaking. Results of the study also reported that majority of the students (46.7%) were moderately high and highly anxious in presenting their URP results orally. From the results, it can be concluded that not all students who felt anxiety in doing a speech in public experienced high anxiety in delivering URP presentations. It seems possible that these results are due

to characteristics of the respondents and their major course of studies. As the respondents are engineering students, perhaps they have more confidence in discussing technical information with a technical audience, rather than public speaking on general information to general audience.

The other major finding was the level of technical oral presentation anxiety which was found to have a very weak relationship with students' performance in presentations. However, the anxiety experienced may well have contributed to the ineffectiveness of the students' presentations. Data shows that even though majority of the students experienced high anxiety in presentations, their scores in the presentations were still high. It seems clear that anxiety facilitates students' performance. This finding adds to a growing body of literature on the facilitating role of anxiety in students' task performance (MacIntyre & Gardner, 1989).

To better understand this issue, perceived factors that contributed to students' anxiety were investigated thoroughly through interviews with the respondents. The findings were proven through a triangulation process where interviews with the panel of evaluators were conducted. Several major sources were gathered from the analysis of the interviews and three similar factors were perceived by both parties to be the main sources of anxiety. Table 6.1 below shows similarities in terms of the sources of anxiety perceived by the students and the panel of evaluators. Both students and evaluators agreed that factors such as students' limited technical knowledge, the panel of evaluators and barriers in students' English language contributed to students' technical oral presentation anxiety.

Table 6.1: Similarities between Perceived Sources of Anxiety of the Students and the Panel of Evaluators

• Limited technical knowledge • Panel of evaluators • Barriers in students' English language

Table 6.2 below illustrates the different perceptions between students and panel of evaluators on sources of presentation anxiety. The sources of anxiety mentioned by the students, but not commented on by the panel of evaluators, are the students' negative attitude towards technical oral presentations, unhelpful supervisors and time constraints. Lack of presentation skills and inadequate preparation are the two factors that are emphasized by the evaluators but not pointed out by the students.

Table 6.2: Differences of Perceived Sources of Anxiety between Students and the Panel of Evaluators

Students	Panel of evaluators
• Attitude towards presentations • Unhelpful supervisors • Time constraints	• Presentation skills • Presentation preparation

The panel of evaluators did not mention time constraints as a source of anxiety but they discussed it in relation to presentation preparation. The evaluators believed that with adequate preparation, the problem of time constraints can be solved. With regard to the students' own attitudes towards technical oral presentations, the evaluators cannot make any assumptions or conclusions. The sources of anxiety identified in the present study can help educators better understand the barriers students experience in communication through academic oral presentations.

6.2 Summary of the Findings

The discussions of the findings are summarized in Figure 6.1 which illustrates the independent variable (technical oral presentation (TOP) anxiety), the dependent variable (URPII final oral presentation performance), the factors (social and individual factors) and their effects and relationships on one another.

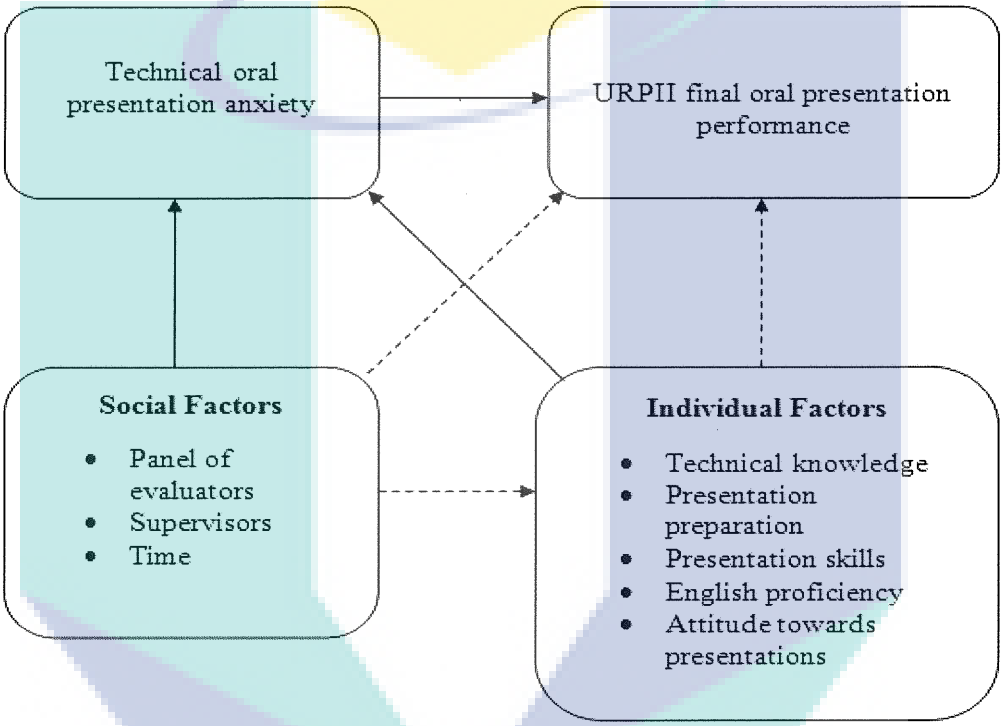

Figure 6.1: Factors for TOP anxiety and the relationships between the variables

Relationships between Technical Oral Presentation (TOP) Anxiety and URPII Final Oral Presentation Performance.

The students' levels of TOP anxiety are shown in the responses to an adapted version of the Personal Report of Public Speaking Anxiety (PRPSA-34) questionnaire, while the URPII final oral presentation performance refers to the engineering students' scores in the URPII final oral presentation assessment. The statistical analysis showed that students' TOP anxiety had a very weak negative

effect on their presentation performance. Even though the effect of TOP anxiety on students' presentation performance was weak, the negative relationship found indicated that the higher the TOP anxiety level, the lower their presentation performance. Despite this, the majority of students who were reported to be moderately high and highly anxious in delivering their URPII final oral presentations still scored high marks in the URPII final oral presentation assessment. The findings suggested that the anxiety experienced by the students had a positive or facilitative effect on performance, where the anxiety enhanced their performance. This is in accordance with the assumption put forward in the Processing Efficiency Theory (PET) (Eysenck & Calvo, 1992) which suggests that the presence of high levels of anxiety in students may cause an increase in the effort to improve performance. In the present study, it could be assumed that when these engineering students were highly anxious in delivering the presentations, they put in more effort by allocating more time for the presentation preparation.

In addition, the negative and weak correlation found between anxiety and oral performance was comprehensible because it indicates that anxiety is only one of many factors affecting effective technical oral presentations. The results still however, indicate the influence of anxiety on students' oral performance.

Influences of the Social Factors and the Individual Factors on TOP anxiety

Findings show that factors such as the panel of evaluators, supervisors, time constraints, technical knowledge, presentation preparation, presentation skills, English proficiency and attitudes towards presentations contributed to the engineering students' TOP anxiety. According to Social Cognitive Theory (SCT) (Bandura, 1986), environmental factors, human behaviours and personal factors interact with and influence each other. Based on SCT, social factors (within the

environment factors) which refer to extrinsic factors, are composed of the panel of evaluators who assessed the URP II final oral presentations, the supervisors who guided the students in conducting the URP and the time constraints faced by the students. Individual factors, however, comprise the technical knowledge possessed by the students, their presentation preparation, their presentation skills, their English language proficiency and the attitudes of the students towards presentations. Both the students and the panel of evaluators perceived that the social and individual factors contributed to the anxiety experienced by the students in delivering their URPII final oral presentations.

Influences of the Social Factors and the Individual Factors on Students' Presentation Performance

Statistical analysis shows that students' performance is weakly affected by students' TOP anxiety and anxiety is considered as one of the many factors that influences students' performance in their URPII final oral presentation assessment. It is possible therefore, that both social and individual factors can also influence the students' presentation performance.

In conclusion, the major contribution of the current research has been the exploration of oral communication apprehension in relation to technical oral presentation (TOP) anxiety and the relationship between technical oral presentation anxiety and the students' overall performance in an important academic presentation, in an engineering education context. Another important contribution has been the examination of the sources of anxiety experienced by students that may offer an explanation to the complex relationship between technical oral presentation anxiety and oral performance. Furthermore, this study also contributes to our understanding

of the impact of oral presentation as an assessment form on students' performance in higher education.

6.3 Pedagogical Implications

This study was conducted in such a way that future researchers will be able to duplicate the process but using their own research context and situations. Furthermore, the findings in this study are believed to be able to help educators better understand ESL learners' anxiety in delivering formal oral academic presentations and so could assist in effectively planning their classroom practices.

Based on this study, a number of pedagogical implications are highlighted.

1. The findings of this study reported that the majority of the engineering students experienced anxiety in delivering technical oral presentations and communication apprehension in English language. Findings also show that both PRPSA-34 (Richmond & McCroskey, 1998) and PRCA-24 (McCroskey, 1982a) questionnaires are reliable instruments to measure presentation anxiety and communication apprehension in general. In most public universities in Malaysia, public speaking programmes are offered to tertiary students and research studies have found that public speaking is the most feared or threatening situation for many people (Tong, 2009; Rojo-Laurilla, 2007; Kavaliauskienė, 2006; Woodrow, 2006; King, 2002). Therefore, the administration of the PRPSA-34 and PRCA-24 questionnaires in the course is highly recommended as an aid to increase both students' and teachers' awareness of the students' level of anxiety. The administration of the questionnaires at the start of the course creates opportunities for the teacher to explore the anxiety experienced and the reasons that contribute to the development of the anxiety. Informal discussions can be carried out with students,

especially with those who scored high anxiety levels in both questionnaires, to discuss this issue further. It is hoped that such informal discussion can be an open platform for the students to share the reasons for their anxiety and so help the teachers to determine the best strategy to alleviate students' anxiety and help them be better presenters.

2. The URPII final oral presentation assessment is an important presentation evaluation, which is an integral part of engineering education. It is mandatory for the engineering students in this study to pass this evaluation in order to graduate. The result of this examination determines the grading which consequently affects their final Cumulative Grade Point Average (CGPA). To date, academic oral presentations as part of assessments in higher education institutions are also being practised in other courses, such as case presentations for medical students, moots for law students and design jury for students in architecture courses. Integration of communication skills in other disciplines in the university curriculum should, therefore, be introduced and an example of this could be the introduction of a public speaking module in an engineering course. In this way, such ESP public speaking courses will be geared towards preparing engineering students for their URP oral presentation assessments in a more effective manner. A needs analysis has to be conducted to ensure that the syllabus, the content and the activities prepared meet the specific needs of the ESP learners as well as fulfill the learning objectives and outcomes of engineering education.

3. Generally, technical oral presentations (TOP) are part of the public speaking genre. However, technical oral presentations possess some unique characteristics. They contain both technical content as well as verbal and non-verbal communication. The content of technical oral presentations may involve flowcharts, drawings, tables

or charts, graphs and even equations (Rockland, 2001). For example, Rockland suggested including the full drawings in one slide and specific parts of the drawings using the crop tool in other slides for a better view and a clearer understanding for the audience. In technical slides, the pertinent information is usually put in tables and charts for clearer understanding. Proper reference must be made clearly. In a technical presentation, the use of equations is unavoidable. Therefore, the presenter should use the Equation Editor (R) or Mathtype (R) applications for their readability and have a maximum number of three equations on one slide. It is important that the students are taught to prepare slides concisely as it allows them to present their technical oral presentations more effectively. It is equally important that the students have adequate instruction on both verbal and non-verbal communication skills. Specific tutorial time should be allocated and spent on skills instruction. As one evaluator from the industry commented in the interview, the students may not have had sufficient exposure in effective oral presentations. Based on that comment, it is recommended that students be exposed to and shown videos on oral presentations, demonstrating effective and ineffective verbal and non-verbal communication. It is also important for the students are made aware of the performance standard that is expected from them. The students then must be given the opportunity to practise these skills. Cooper (2005) argued that it is not valid for students to be tested on skills which are not properly taught and without any practice.

4. Findings in this study reveal that the major source of presentation anxiety as perceived by the students is the panel of evaluators. In this context, the evaluation panel plays a very significant role in providing a supportive atmosphere for students to feel at ease while delivering their presentations. Research studies have found that a supportive atmosphere is essential for presentation success (Shafer, 2010) and it is

significant in reducing anxiety (Worde, 2003). In providing a supportive instructional setting, the evaluators' individual personality and attitude towards students must be positive and encouraging. As facial expressions of the evaluators were found to have an impact on presenters, displaying a pleasant expression may help to ease the students' fear of presentation. Furthermore, encouraging words to strengthen their self-confidence could be given before the students' presentations. In addition, using verbal persuasion by reminding the students to perceive presentations as a sharing session and putting less emphasis on presentations as assessment might help to increase students' self-efficacy and self-confidence.

5. Limited technical knowledge is the major factor that affected the students' presentation anxiety as perceived by the panel of evaluators. The technical knowledge pointed out by the panel refers to the students' knowledge of their URP project. The current practice in the engineering faculty revealed that most URP topics were decided by the supervisors and were within their field of expertise. From the interviews with the faculty lecturers, most of the topics cover theory-based experiments and do not emphasize the practicality and the application of the experiment results into industries or the real world. The students' technical knowledge could be enhanced through collaboration with industries and could also be done by the appointment of practising engineers as industrial supervisors for students' URP projects. With this collaboration, it is strongly believed that not only better URP topics can be generated but that they can be more practical. The industrial supervisor may propose URP topics such as the actual problems faced by the industries. However, the complexity of the projects must be moderate and be able to be solved within two semesters, which is approximately 12 months. With supervision from the faculty lecturers and support from the practising engineers, it is believed

that this collective effort will help move URP project assessment to a higher level. This will definitely enhance the students' interest and competency in the project, knowing that they contributed towards solving a real problem. Eventually, the URP projects aim to provide work experience while still in an academic setting and the transit of students to the professional work environment will be achieved successfully.

It is hoped that the industry's involvement in students' evaluation will strengthen the collaboration between the university and the industry. In addition, industry's feedback offers different perspectives on the students' projects and an example of this could be the application of the outcome from the research conducted in industries. These different perspectives undoubtedly help students to become more practical researchers and this may help, in turn, improve their current projects. Indeed, this kind of collaboration benefits all parties namely the students, the university and the industry.

6.4 Recommendations for Future Research

Based on the results and conclusions drawn from the study, the following recommendations for further research are presented.

1. This study confined the data collection to chemical final year engineering students only as chemical engineering is one of UMP's niche areas and so this selection was deemed appropriate. However, this may not be a true representation of all final year students in the engineering field. A quantitative study that involves a bigger population could be used to provide richer data and better generalization. For instance, it could involve all final year students from all engineering faculties from various universities in Malaysia.

2. A longitudinal study could yield better results and more comprehensive data analysis involving more complicated statistical analysis such as factor analysis and Structure Equation Modelling (SEM) could be executed.

3. The present study gathers factors that may have contributed to students' anxiety as perceived by the students and the evaluators. To have better empirical evidence on the factors that impact students' performance in technical oral presentation assessment, a more detailed statistical analysis could be conducted to measure other impacts of the factors on students' anxiety.

4. In addition, future studies on technical oral presentation (TOP) anxiety could also be conducted using different oral genres. Studies could also be extended to oral communication events in industries such as briefings, trainings, consultations and demonstrations or instructions on using new equipments.

5. Moreover, it would also be interesting to carry out a study that investigates the strategies used by highly anxious individuals in performing a pressure inducing, high-stakes task (which demand their undivided focus and more in-depth knowledge on the task) effectively and successfully. The factors that determine the strategies used could also be examined.

6. Future researchers may also carry out systematic investigations on the extent the presentation topic affects students' anxiety in oral presentation. A comparative study between technical information and general information can be conducted to better understand the issue of anxiety in oral presentations.

7. An investigation of peer assessment in assessing a technical oral presentation can also be conducted. The involvement of peers in an oral assessment has been

found to benefit the speakers, the teachers (the evaluators) and the students who evaluated their colleagues' oral presentations.

6.5 Conclusion

The current study has contributed to the ESP literature in Malaysia in terms of oral communication anxiety, particularly in the genre of technical oral presentations (TOP) among ESL engineering learners. It has provided further empirical evidence for the level of oral communication apprehension in English and the level of technical oral presentation in English. It shows that even though the majority of students experienced moderate oral communication apprehension in English, the majority of them were highly anxious in delivering public speaking. The high level of anxiety in general public speaking context among majority of students seems to verify and substantiate the results for the moderately high and high level of technical oral presentation anxiety experienced by majority of the students.

This study also supports the literature on the impact of anxiety on students' academic achievement. However, the statistically insignificant results found in this study between technical oral presentation (TOP) anxiety and students' technical oral presentation performance suggest that there are other significant internal and external factors that may have influenced the students' performance. An assumption is made that the factors for students' anxiety may have also contributed to and influenced the students' performance. As such, there is also a need for further research which involves a more complicated statistical analysis to prove the assumption.

Statistical analysis also reported that an inverse, but weak, relationship was found between technical oral presentation (TOP) anxiety and technical oral presentation (TOP) performance. Anxiety that is present among the students in this

study is considered a facilitating anxiety because of the high scores the students received even though majority of them reported experiencing moderately high and high levels of technical oral presentation anxiety.

The current study also revealed factors that increase the students' anxiety from the perceptions of both the students and the evaluators. The factors that are perceived to have impact on or influence the students' anxiety in technical oral presentation (TOP) assessment mirrors the challenges they faced in delivering technical oral presentations effectively. By understanding the factors contributing to the students' anxiety and the challenges students experience in delivering technical oral presentations, it is hoped that this will help improve the instruction and teaching of technical oral presentations to engineering students in an ESP context in terms of teaching techniques (particularly, ways to alleviate students' anxiety) and syllabus design.

The findings confirm the value of an in-depth investigation of anxiety and learners' performance in the context of academic oral presentation at the tertiary level. It is vital to give prominence to the students' actual learning experience in a specific learning context to better understand the various processes that are involved and experienced by the learners. Considering that higher education institutions are feeders to industries, the current study has shed some light on the demands of Malaysian employers to have skillful employees with high level of oral communication skills, particularly oral presentation skills. The in-depth investigation on technical oral presentation (TOP) conducted in this study is a significant step forward in preparing students to be global engineers with a high level of competency in oral communication skills.

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Appendix 1: List of Publications and Conference Presentations

Noor Raha Mohd Radzuan & Kaur, S. (2010). Engineering Lecturers' Perceptions of Students' Technical Presentations in English: Negotiating Best Practices. Paper presented at The 3rd Regional Conference on Engineering Education (*RCEE 2010*) and Research in Higher Education *2010* (*RHEd 2010*), Hotel Margherita, Sarawak, Malaysia, 7-9 June 2010.

Noor Raha Mohd Radzuan & Kaur, S. (2010). Communication Apprehension and Self- perceived Communication Competence Among Final Year Chemical Engineering Students: A Pilot Study. Paper presented at the International Conference on Linguistics, Literature and Culture 2010 (ICLLIC 2010), Eastin Hotel, Penang, Malaysia, 1-2 June 2010.

Noor Raha Mohd Radzuan & Kaur, S. (2010). A survey of oral communication apprehension in English among ESP learners in an engineering course. *English for Specific Purposes World, 10*(31), 1-14.

Noor Raha Mohd Radzuan & Kaur, S. (2011). Technical Oral Presentations in English: Qualitative Analysis of Engineering Students' Sources of Anxiety. *Procedia – Social and Behavioural and Sciences*, Vol. 29, 1436 – 1445.

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Noor Raha Mohd Radzuan & Kaur, S. (2012). Technical oral presentation anxiety: Students' experiences versus evaluators' perceptions . *Procedia – Social and Behavioural and Sciences*, Vol. xx, xx – xx (Forthcoming).

Appendix 2: Approval Letter to Conduct Research

Fakulti Kejuruteraan Kimia & Sumber Asli
Faculty of Chemical & Natural Resources Engineering

Lebuhraya Tun Razak, 26300 Gambang,
Kuantan, Pahang Darul Makmur.
Tel : (+609) 549 2888
Faks/Fax : (+609) 549 2889
Web : www.ump.edu.my

Universiti Malaysia PAHANG

RUJ. KAMI *(OUR REF.)* : UMP.15.02/14.14/01 (02)
RUJ. TUAN *(YOUR REF.)* :

1st April 2010

NOOR RAHA MOHD RADZUAN
Centre for Modern Languages and Human Sciences
Universiti Malaysia Pahang.

Dear Sir/ Madam,

CONSENT TO CONDUCT A STUDY AND COLLECT DATA AT THE FACULTY OF CHEMICAL & NATURAL RESOURCES ENGINEERING, UNIVERSITI MALAYSIA PAHANG

Your letter dated 14th January 2010 regarding the above matter is referred to.

2. After consulting some faculty members, we hereby approve your request to conduct a study and collect data from our final year students and some faculty lecturers. We hope that the findings from this study will assist the faculty to better prepare our students to be more competitive engineers in their workplace.

3. We wish you all the best in your PhD study.

Thank you.

Yours sincerely,

(DR. CHE KU MOHAMMAD FAIZAL BIN CHE KU YAHYA)
Deputy Dean (Academic and Student Affairs)
Faculty of Chemical and Natural Resources Engineering
Universiti Malaysia Pahang

cc:
- Dean CMLHS
- PSM Coordinator FKKSA

Appendix 3: Explanatory Statement

Dear students,

My name is Noor Raha Mohd Radzuan. I am a PhD candidate conducting a research project under the supervision of Associate Professor Dr Sarjit Kaur from the English Language Studies Section, School of Humanities, Universiti Sains Malaysia, Penang. This study will be written up as my doctoral dissertation.

Invitation to participate
As you are an engineering student in Universiti Malaysia Pahang, I would like to invite you to participate in my study. This study involves participants in answering a set of questionnaire. I obtained your contact details from your faculty.

The aim/purpose of the research
The primary aim of this research is to explore the level of oral communication apprehension and technical presentation anxiety in English among engineering students and the factors contributing to anxiety.

How much time will be needed to answer the questionnaire?
The time required to answer the questionnaire will be approximately 15 minutes. You are given two weeks from the date of this Explanatory statement to submit your answers, but of course you can do so earlier if you wish.

Can you withdraw from the research?
Participation in this study is voluntary and you are under no obligation. However, if you consent to participate, you may not withdraw once the questionnaire has been submitted. In submitting the survey, you give your consent to participate in this study.

Confidentiality
The confidentiality of your answers is ensured. The results of the research will appear in my thesis, as well as in journal publications and in presentations at conferences, but you will not be personally identifiable in any of these reports.

Thank you.

NOOR RAHA MOHD RADZUAN
Mobile: 019 5766145
E-mail: nrmr09_HUM108@student.usm.my

Appendix 4: Questionnaire for Students

QUESTIONNAIRE

SECTION A: DEMOGRAPHIC INFORMATION

For each question, mark (**X**) in the appropriate space provided.

1.Gender : ☐ Male ☐ Female

2. Age : ☐ 20-25 years old ☐ 26-30 years old

3. Last English course taken in UMP and grade: UHL ☐ Grade ☐

4. Course : ☐ BKB ☐ BKC ☐ BKG

5. Matric number: _____

SECTION B: FEELINGS ABOUT COMMUNICATING WITH OTHER PEOPLE

This section consists of 24 statements concerning feelings about communicating with other people. Indicate the degree to which the statements apply to you by placing a tick (/) under the appropriate number whether you (1) strongly agree, (2) agree, (3) are undecided(4) disagree, (5) strongly disagree with each statement. Please work quickly and record your first impression.

	Statements	Scale of Agreement				
		1	2	3	4	5
1.	I dislike participating in group discussions					
2.	Generally, I am comfortable while participating in group discussions.					
3.	I am tense and nervous while participating in group discussions					
4.	I like to get involved in group discussions					
5.	Engaging in a group discussion with new people makes me tense and nervous.					
6.	I am calm and relaxed while participating in group discussions.					

	Statements	Scale of agreement				
		1	2	3	4	5
7.	Generally, I am nervous when I have to participate in a meeting.					
8.	Usually, I am comfortable when I have to participate in a meeting.					
9.	I am very calm and relaxed when I am called upon to express an opinion at a meeting.					
10.	I am afraid to express myself at meetings.					
11.	Communicating at meetings usually makes me uncomfortable					
12.	I am very relaxed when answering questions at a meeting.					
13.	While participating in a conversation with a new acquaintance, I feel very nervous.					
14.	I have no fear of speaking up in conversations.					
15.	Ordinarily I am very tense and nervous in conversations.					
16.	Ordinarily I am very calm and relaxed in conversations.					
17.	While conversing with a new acquaintance, I feel very relaxed.					
18.	I'm afraid to speak up in conversations.					
19.	I have no fear of giving a speech.					
20.	Certain parts of my body feel very tense and rigid while giving a presentation.					
21.	I feel relaxed while giving a speech.					
22.	My thoughts become confused and jumbled when I am giving a speech.					
23.	I face the prospect of giving a speech with confidence.					
24.	While giving a speech, I get so nervous I forget facts I really know					

SECTION C: FEELINGS ABOUT GIVING A TECHNICAL PRESENTATION

This section consists of 34 statements concerning feelings about giving a technical presentation. Indicate the degree to which the statements apply to you by placing a tick (/) under the appropriate number whether you (1) strongly agree, (2) agree, (3) are undecided, (4) disagree, (5) strongly disagree with each statement. Please work quickly and record your first impression.

	Statements	Scale of Agreement				
		1	2	3	4	5
1.	While preparing for giving a technical presentation, I feel tense and nervous.					
2.	I feel tense when I see the word technical presentation in a course outline when studying.					
3.	My thoughts become confused and jumbled when I am giving a technical presentation.					
4.	Right after giving a technical presentation, I feel that I have had a pleasant experience.					
5.	I get anxious when I think about a technical presentation coming up.					
6.	I have no fear of giving a technical presentation.					
7.	Although I am nervous just before starting a technical presentation, I soon settle down after starting and feel calm and comfortable.					
8.	I look forward to giving a technical presentation.					
9.	When the instructor announces a speaking assignment in class, I can feel myself getting tense.					
10.	My hands tremble when I am giving a technical presentation.					
11.	I feel relaxed while giving a technical presentation.					
12.	I enjoy preparing for a technical presentation.					

	Statements	Scale of agreement				
		1	2	3	4	5
13.	I am in constant fear of forgetting what I prepared to say.					
14.	I get anxious if someone asks me something about my topic that I do not know.					
15.	I face the prospect of giving a technical presentation with confidence.					
16.	I feel that I am in complete possession of my self while giving a technical presentation.					
17.	My mind is clear when giving a technical presentation.					
18.	I do not dread (extremely anxious) giving a technical presentation.					
19.	I perspire just before starting a technical presentation.					
20.	My heart beats very fast just as I start a technical presentation.					
21.	I experience considerable anxiety while sitting in the room just before my technical presentation starts.					
22.	Certain parts of my body feel very tense and rigid while giving a technical presentation.					
23.	Realizing that only a little time remains in a technical presentation makes me very tense and anxious.					
24.	While giving a technical presentation, I know I can control my feelings of tension and stress.					
25.	I breathe faster just before starting a technical presentation.					
26.	I feel comfortable and relaxed in the hour or so just before giving a technical presentation.					
27.	I do poorer in a technical presentation because I am anxious.					

	Statements	Scale of agreement				
		1	2	3	4	5
28.	I feel anxious when the teacher announces the date of the speaking assignment.					
29.	When I make a mistake while giving a technical presentation, I find it hard to concentrate on the parts that follow.					
30.	During an important technical presentation, I experience a feeling of helplessness building up inside me.					
31.	I have trouble falling asleep the night before a technical presentation.					
32.	My heart beats very fast when I present a technical presentation.					
33.	I feel anxious while waiting to give my technical presentation.					
34.	While giving a technical presentation, I get so nervous I forget facts I really know.					

Thank you! ☺

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Appendix 5: Original version of PRPSA-34

Personal Report of Public Speaking Anxiety (PRPSA)

Directions: Below are 34 statements that people sometimes make about themselves. Please indicate whether or not you believe each statement applies to you by marking whether you:

Strongly Disagree = 1; Disagree = 2; Neutral = 3; Agree = 4; Strongly Agree = 5.

_____1. While preparing for giving a speech, I feel tense and nervous.

_____2. I feel tense when I see the words "speech" and "public speech" on a course outline when studying.

_____3. My thoughts become confused and jumbled when I am giving a speech.

_____4. Right after giving a speech I feel that I have had a pleasant experience.

_____5. I get anxious when I think about a speech coming up.

_____6. I have no fear of giving a speech.

_____7. Although I am nervous just before starting a speech, I soon settle down after starting and feel calm and comfortable.

_____8. I look forward to giving a speech.

_____9. When the instructor announces a speaking assignment in class, I can feel myself getting tense.

_____10. My hands tremble when I am giving a speech.

_____11. I feel relaxed while giving a speech.

_____12. I enjoy preparing for a speech.

_____13. I am in constant fear of forgetting what I prepared to say.

_____14. I get anxious if someone asks me something about my topic that I don't know.

_____15. I face the prospect of giving a speech with confidence.

_____16. I feel that I am in complete possession of myself while giving a speech.

_____17. My mind is clear when giving a speech.

_____18. I do not dread giving a speech.

_____19. I perspire just before starting a speech.

_____20. My heart beats very fast just as I start a speech.

_____21. I experience considerable anxiety while sitting in the room just before my speech starts.

_____22. Certain parts of my body feel very tense and rigid while giving a speech.

_____23. Realizing that only a little time remains in a speech makes me very tense and anxious.

_____24. While giving a speech, I know I can control my feelings of tension and stress.

_____25. I breathe faster just before starting a speech.

_____26. I feel comfortable and relaxed in the hour or so just before giving a speech.

_____27. I do poorer on speeches because I am anxious.

_____28. I feel anxious when the teacher announces the date of a speaking assignment.

_____29. When I make a mistake while giving a speech, I find it hard to concentrate on the parts that follow.

_____30. During an important speech I experience a feeling of helplessness building up inside me.

_____31. I have trouble falling asleep the night before a speech.

_____32. My heart beats very fast while I present a speech.

_____33. I feel anxious while waiting to give my speech.

_____34. While giving a speech, I get so nervous I forget facts I really know.

Scoring: To determine your score on the PRPSA, complete the following steps:

Step 1. Add scores for items 1, 2, 3, 5, 9, 10, 13, 14, 19, 20, 21, 22, 23, 25, 27, 28, 29, 30, 31, 32, 33, and 34

Step 2. Add the scores for items 4, 6, 7, 8, 11, 12, 15, 16, 17, 18, 24, and 26

Step 3. Complete the following formula:

PRPSA = 72 - Total from Step 2 + Total from Step 1

Your score should be between 34 and 170. If your score is below 34 or above 170, you have made a mistake in computing the score.

High = 120-170; Moderately high = 111-119; Moderate = 93-110; Moderately Low = 85-92; Low = 34-84

Source: Richmond, V. P., & McCroskey, J. C. (1998). *Communication: Apprehension, Avoidance and Effectiveness* (5th ed.). Boston, Mass: Allyn and Bacon.

Appendix 6: Student Consent Form for Focus Group Interview

CONSENT TO PARTICIPATE IN A FOCUS GROUP INTERVIEW

Dear Student,

My name is Noor Raha Mohd Radzuan. I am a PhD candidate conducting a research project titled "An Analysis of Oral Communication Apprehension and Technical Oral Presentation Anxiety among Engineering Students" under the supervision of Associate Professor Dr Sarjit Kaur from the English Language Studies Section, School of Humanities, Universiti Sains Malaysia, Penang. This study will be written up as my doctoral dissertation.

As you are one of students involved in URPII final oral presentation recently, I would like to invite you to participate in my study. This study requires you to participate in a focus group interview.

The primary aim of this research is to explore the level of oral communication apprehension and technical presentation anxiety in English among engineering students and the factors contributing to anxiety.

Your participation in this interview is completely voluntary and you may withdraw your consent to participate at any time during the process. If you choose to do so, any information derived from your participation will be deleted from the evaluation findings.
This session will be audio-taped and it will be transcribed to ensure accurate reporting of the information that you provide. The session will take approximately one hour.

All information gathered from the interview will be kept confidential and will be used of research purposes only. The results of the research will appear in the researcher's thesis, as well as in journal publications and in presentations at conferences, but you will not be personally identifiable in any of these reports.

You will be given a copy of this consent form to keep for your records.

Thank you.

NOOR RAHA MOHD RADZUAN
Mobile: 019 5766145
E-mail: nrmr09_HUM108@student.usm.my

I was informed about the purpose of the interview by reading this consent form myself or by having an interviewer read it for me. I agree to participate. I have signed the consent form as appears below.

Signature of the participant :.....

Name of the participant : .....

Date : .....

Signature of the researcher : .....

Name of the researcher : NOOR RAHA MOHD RADZUAN

Date : .....

UMP

Appendix 7: Focus Group Interview Questions for Students

FOCUS GROUP INTERVIEW QUESTIONS FOR STUDENTS

1. Do you like giving oral presentations?
   Adakah anda suka membuat pembentangan lisan?

2. Do you like giving oral presentations in English? Why? Please explain.
   Adakah anda suka membuat pembentangan lisan dalam Bahasa Inggeris? Kenapa? Sila jelaskan.

3. Describe and elaborate on your previous technical oral presentation experience (your Undergraduate Research Project (URP) presentation).
   Ceritakan dan huraikan pengalaman anda membentangkan Projek Sarjana Muda (PSM) yang lalu.

4. Please discuss about what bothers the most in presenting your URP.
   Ceritakan perkara yang paling mengganggu anda dalam membentangkan PSM yang lalu.

5. Are there other things that bother you about your URP presentation that you can tell me, and how do you react to them?
   Apakah perkara-perkara lain yang mengganggu anda dalam membentangkan PSM yang lalu, dan apakah reaksi anda terhadapnya/bagaimanakan anda hadapinya?

6. Which stage of your URP presentation makes you feel most anxious? Is it before, during or after your presentation?
   Dalam pembentangan PSM, fasa manakah yang paling anda bimbang? Adalah sebelum, semasa atau selepas pembentangan?

7. In your opinion, to what extent does your level of anxiety affect your presentation performance?
   Pada pandangan anda, sejauh manakah tahap kebimbangan anda memberi kesan kepada prestasi pembentangan?

8. How do you feel now after having done with the URP presentation?
   Apa perasaan anda selepas pembentangan PSM selesai?

Appendix 8: Panel of Evaluators Consent Form

CONSENT TO PARTICIPATE IN AN INTERVIEW

Dear Dr/ Sir/ Madam,

My name is Noor Raha Mohd Radzuan. I am a PhD candidate conducting a research project titled "An Analysis of Oral Communication Apprehension and Technical Oral Presentation Anxiety among Engineering Students" under the supervision of Associate Professor Dr Sarjit Kaur from the English Language Studies Section, School of Humanities, Universiti Sains Malaysia, Penang. This study will be written up as my doctoral dissertation.

As you are one of the panel of evaluators for URPII final oral presentation recently, I would like to invite you to participate in my study. This study requires you to participate in an individual interview.

The primary aim of this research is to explore the level of oral communication apprehension and technical presentation anxiety in English among engineering students and the factors contributing to anxiety.

Your participation in this interview is completely voluntary and you may withdraw your consent to participate at any time during the process. If you choose to do so, any information derived from your participation will be deleted from the evaluation findings.

This session will be audio-taped and it will be transcribed to ensure accurate reporting of the information that you provide. The session will take approximately one hour.

All information gathered from the interview will be kept confidential and will be used of research purposes only. The results of the research will appear in the researcher's thesis, as well as in journal publications and in presentations at conferences, but you will not be personally identifiable in any of these reports.

You will be given a copy of this consent form to keep for your records.

Thank you.

NOOR RAHA MOHD RADZUAN
Mobile: 019 5766145
E-mail: nrmr09_HUM108@student.usm.my

I was informed about the purpose of the interview by reading this consent form myself or by having an interviewer read it for me. I agree to participate. I have signed the consent form as appears below.

Signature of the participant :.....

Name of the participant : .....

Date : .....

Signature of the researcher : .....

Name of the researcher : NOOR RAHA MOHD RADZUAN

Date : .....

UMP

Appendix 9: Interview Questions for Panel of Evaluators

INTERVIEW QUESTIONS FOR PANEL OF EVALUATORS

1.What do you think of the students' oral presentation anxiety levels during URPII final oral presentations?
Apa pendapat anda mengenai tahap kebimbangan pelajar-pelajar terhadap pembentangan PSM?

2. From your observation, what kind of speech anxiety symptoms are manifested by these students?
Dari pemerhatian anda, apakan simtom-simtom kebimbangan yang ditunjukkan oleh para pelajar?

3. Have you ever felt bored or lost focus when listening to your students' oral technical presentations? Why?
Adakah anda pernah merasa bosan atau hilang fokus semasa mendengar pembentangan PSM? Kenapa?

4. Could you suggest elements of effective oral technical presentation skills that engineering students must possess?
Apa pendapat anda mengenai elemen-elemen yang penting untuk membentangkan PSM secara efektif?

5. What do you think of chemical engineering students' oral presentation skills in terms of their delivery, audience attention and English language ability?
Apa pendapat anda mengenai kemahiran para pelajar tahun akhir fakulti kimia pembentangan lisan? Dari segi delivery, audience attention dan kemahiran bahasa Inggeris?

6. In your opinion, what bothers students the most in presenting their URPII effectively?
Pada pendapat anda, apakah perkara/ faktor yang paling mengganggu/ menyebabkan pelajar-pelajar risau dan bimbang untuk membentangkan PSM secara efektif?

7. In your opinion, are there other factors that bother the students in delivering URPII presentations effectively?
Pada pendapat anda, apakah perkara-perkara/ faktor-faktor lain yang juga mengganggu pelajar-pelajar dalam membentangkan PSM secara efektif?

8. In your opinion, to what extent does students' level of anxiety affect their presentation performance?
Pada pandangan anda, sejauh manakah tahap kebimbangan pelajar-pelajar itu memberi kesan kepada prestasi pembentangan?

Appendix 10: URPII Score Sheets

BKC4944/BKB4944/BKG494-

Universiti Malaysia PAHANG
Engineering • Technology • Creativity

OVERALL MARKS : 100

FACULTY OF CHEMICAL AND NATURAL RESOURCES ENGINEERING

FINAL PRESENTATION (20%)
UNDERGRADUATE RESEARCH PROJECT II

SECTION A: STUDENT DETAILS

Student's name: .....

Metric No. :..... Section: .....

Panel's name: .....

Project Title: .....

SECTION B: ASSESSMENT

Instruction: Please assess each item using the given scales. Fractional marks will be given for each category.

Item Assessed	Unacceptable (1)	Acceptable (2)	Average (3)	Good (4)	Very Good (5)	Score
Content						
Objective, problem statement and scope of research	Objective, problem statement and research scope are not clear.	Objective, problem statement and research scope are partly discussed.	Objective, problem statement and research scope are explained.	Objective, problem statement and research scope are clearly explained.	Objective, problem statement and research scope are clearly explained. Interesting presentation.	X 3
Research background & literature review	Poor understanding of topic, inadequate research or very little research.	Acceptable understanding of topic, adequate research evident, sources cited.	Good understanding of topic, adequate research evident, sources cited. Sufficient literature research.	Good understanding of topic, adequate research evident, sources cited. Sufficient and relevant literature research.	Complete understanding of topic, topic extensively researched, and variety of sources is cited. Literature research contains information relevant and directly related to research.	X 3
Research methodology / design	Explanation on research methodology/ design is not applicable.	Research methodology/ design not clearly explained (vague)	Research methodology / design are clearly explained.	Research methods / design are clearly explained. Well structured and related to the research objectives.	Clearly explain the research methods / design. Student is capable of discussing the materials in an interesting manner.	X 3
Results and Discussions	Not enough result and research analysis.	Results are presented without any analysis	Results and analysis are not clearly explained	Results and analysis are clearly explained	Results and analysis are clearly explained. Good and interesting discussion.	X 3
Conclusions and Recommendations	No conclusion and recommendation.	The conclusion is poorly explained with no recommendation.	The conclusion and recommendation are partially explained.	The conclusion is clearly explained and appropriate recommendation is given to improve the project.	The conclusion is clearly explained with interesting discussion. Student shows his/her understanding on the subject of discussion. Good recommendations are given to improve the project	X 3

Item Assessed	Unacceptable (1)	Acceptable (2)	Good (3)	Very Good (4)	Excellent (5)	Score
Presentation Skills						
Style and communication skills	Student only read the slide and no eye-contact.	Less fluent on the material of presentation. Occasional but un-sustained eye-contact.	Some mumbling but audible most of the time, little eye contact.	Clear articulation but not as polished. The slides contribute to the quality of presentation. Good eye-contact.	Clear articulation, confidence and good eye contact. The use of slide enhanced the presentation.	
Ability to answer question & response towards criticisms	Not answering the question and unable to accept criticisms from panels.	Student answers the question but still unclear about the subject. Partially can accept criticisms.	Capable of answering and able to explain. Show appropriate respond towards criticisms.	Giving an answer with some evidence or data in supporting the ideas. Show good respond towards criticisms.	Answering the question with carefully planned answer, giving evidence or data to support the ideas. Confident with his/her answer. Manage to handle criticisms very well.	
Personal appearance	Personal appearance is inappropriate for the occasion and audience.	Personal appearance is somewhat appropriate for the occasion and audience.	Good personal appearance, appropriate for the occasion and audience.	Very good personal appearance, appropriate for the occasion and	Excellence. Personal appearance is completely appropriate for the occasion and the audience.	
Length of Presentation	Too long or too short; 6 or more min above or below the allocated time	Within +/- 5 min of the allocated time	Within +/- 3 min of the allocated time	Within +/- 2 min of the allocated time	Finishes on time or within 1 min of the allocated time.	
Visual presentation	Poorly prepared slides are hard to read and hard to follow.	Slides are too busy or lettering too small.	Slide lettering approaching acceptable size and some slides are unclear.	Slide letterring is large enough for entire classroom, but some slides are unclear.	Slides clear and lettering large enough for the entire classroom.	
				TOTAL MARKS		/100

Please give comments and suggestions for the improvement of the student.

Student's Name : _____ Metric No. :_____

Panel's Signature:

_____

Appendix 11: Sample of URPII titles

No	URP TITLE
1	Glucose from oil palm sap
2	Glucose production from oil pam sap
3	Microbe isolation from oil palm sap
4	Microbe isolation from oil palm sap
5	Biodegradation behaviour of bacterial cellulose fibre reinforced with starch/chitosan biocomposite
6	The fabrication of bacterial celluose/chitosan biocomposite for medical application
7	The fabrication of bacterial celluose/betel leaves for antibacterial composite
8	Biodegradable biocomposite film from starch blended with chitosan and gelatin plasticized with glycerol
9	Fabrication and antimicrobial analysis of composite biodegradable film from bread fruit
10	Fabrication and antimicrobial analysis of composite biodegradable film from yam starch
11	Fabrication and antimicrobial analysis of composite biodegradable film from pumpkin starch
12	Fabrication and antimicrobial analysis of composite biodegradable film from cempedak seeds.
13	Design, construction and commisisoning photobioreactor for production of microalgae for biodiesel
14	Optimisation of biopolymer production in 20 L stirred tank fermenter
15	Design of plant to produce fertilizer from chicken manure
16	Extraction of antioxidant activity of ati-ati plants (Lamiaceae) by boiling
17	Spray drying of ati-ati plant boiling extract
18	Butanol production from palm oil mill effluent by anaaerobic fermentation using *Clostridium Saccharoperbutylacetonicum*
19	Butanol production from palm oil mill effluent by anaaerobic fermentation using *Clostridium Saccharoperbutylacetonicum*
20	Butanol production from palm oil mill effluent by anaerobic fermentation using *clostridium beijerinkii*
21	Butanol production from palm oil mill effluent by anaaerobic fermentation using *Clostridium Beijerincki*
22	Scale up of gas-liquid stirred tank bioreactors
23	Protein denaturation in pilot scale spray dryer
24	Protein denaturation in lab scale spray dryer
25	A comparative study of mannitol production by two lactic acid bacteria
26	Fermentation of wood waste hemicellulosic hydrolysate for mannitol production: effect of temperature and PH

27	A comparative study of batch and continuous fermentation for mannitol production in membrane bioreactor
28	Separation of mannitol from reaction mixture using membrane reactor: Effect of transmembrane pressure and cross flow velocity
29	Characterization of fouling kinetics in mannitol separation by resistant in series model
30	Comparison between method of OFAT and DOE in screening of immunoglobulin production stimulating factors
31	Inoculum development for the production of monoclonal antibody against CAH.
32	Medium optimization of monoclonal antibody against CAH
33	Optimizing protocol and identification of IgG detection limit using sandwich ELISA
34	Extraction on antioxidant activity, phenolic content and minerals in guava peel
35	Extraction on antioxidant activity, phenolic content and minerals in banana peel
36	Extraction of papain enzyme from papaya tree leaves using organic solvent
37	Extraction of papain enzyme from papaya tree leaves using hot water extraction
38	Study on whole cell biocatalyst for biodiesel production
39	Study on continuous high gravity bioethanol production fromoil palm trunk sap
40	Study on high production of bioethanol from local biomass
41	Isolation of albumin protein from goat's milk using ion exchange chromatography
42	Separation of milk into fractions rich in casein and whey protein by hollow fibre membrane
43	Batch extraction of caffein from cocoa MCBC I seeds
44	Batch solvent extraction of caffein from *Malaysian Cocoa Board Clone 2* cocoa seeds
45	Production of biodiesel from *jatropha multifidalinn* using air lift bioreactor
46	The production of biodiesedl from *Jatropha curcas linnaeus* using airlift bioreactor
47	Biosorption of Iron II and methylene blue using tea waste
48	Optimization of xylose production from sugarcane bagasse
49	Optimization of xylose production from rice straw
50	Optimization of xylose production from rice straw
51	Optimization of xylose production from sugarcane bagasse
52	Production of protein encpsulated nanofiber from electrospinning for protein release profile analysis
53	Designation of a transdermal pastch for breast cancer theraphy with enhancing the capability of drug delivery
54	Production of nanofiber membrane from electrospinning for drug delivery application