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## **Leadership development of 21st century engineering millennial students in Khalifa University, United Arab Emirates; problem-based learning in action**

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### **Abstract**

Leadership development has become an import aspect of the UAE's educational system. In recent years, UAE leaders have focused on the reform of higher education assessment, curriculum and administration with a view to encouraging Emirati students to contribute to the nation's growth as national human capital, through leadership roles where they will be guided and educated driving the needs of the knowledge economy. In many courses, students are more knowledge recipients than producers; they are considered cognitively active whilst physically inactive where learning is considered a passive process. *BUSS301*, a third-year undergraduate course taught to engineering students has undergone major revisions influenced by student evaluations on application, relevance and assessment. The earlier syllabus entitled *Corporate Leadership and Human Resource Management* (more theoretical and examination driven) has evolved to a more recent *Enquiry Based approach: Teaching and Learning Leadership by Simulation and Theory* where students are driving their own learning through inquiry using a project-based learning (PBL) approach.

**Keywords:** Project-based learning, engineering education, leadership, student-centred learning, constructivism, teambuilding, collaboration.

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## 1. Introduction

Industry and academic research has emphasised the need for engineers to be competent in coupling technical expertise to behavioural and societal issues, to be able to problem solve in multidisciplinary teams and to exhibit high level communication skills (Prescott, El Sakran, Albasha, Aloul & Al-Assaf, 2012). Employers have reported a significant divide between the skills they require in graduates and those presented by employees. Much of these desired graduate attributes are soft skills and form the basis of the OECD's 'definition and selection of competencies: theoretical and conceptual foundations project (DeSoCo)' which developed a key framework of key competencies required in engineers. These competencies lie in the areas of teamwork, communication skills, problem-solving, ethics and professional responsibilities. Several studies have been conducted worldwide which have informed the development of this framework and in turn engineering curricula (Male, Bush & Chapman, 2010; Zaharim, Yusoff, Omar, Mohamed & Muhamad, 2008). Accreditation bodies such as Accreditation Board of Engineering and Technology (ABET) have requested that engineering course curriculum become more reflective of real life engineering practises which challenge and provide opportunities to the student to encounter work place scenarios and further engage with their learning and self-awareness whilst developing interpersonal skills such as teambuilding and communications (Koehn, 2001; 2004; Perusich, Davis, Laware & Taylor, 2007). More specifically, ABET higher education programs in the engineering discipline are expected to create opportunities for students to: (1) devise solutions to real-world, open-ended problems, (2) engage students in their learning through research-based, enquiry-based guided instruction and (3) incorporate the development of soft skills into curriculum namely teamwork, technical writing and public speaking and the ability to communicate with all audiences technical, non-technical and the public (Cho, Cottrell, Mazze, Dika & Woo, 2013). In the Middle East, engineering is one of the most sought after undergraduate courses producing significant numbers of qualified engineers every year. Competition for positions in industry is highly competitive with strong demand for technical competence coupled to effective soft skills. Therefore, there is an impetus on universities to develop these competencies' in their graduates, integrate them into curriculum to meet the needs of the labour market. In this way, students can gain work environment experiences while they are still studying in the university. Several teaching and learning approaches have been adopted and modified over the years. The traditional teaching approach, often referred to the didactic method, is the classic lecture/tutorial/practical session whereby knowledge is transmitted from the teacher to the student. Information transfer is one way and students are akin to receptacles waiting to be filled with knowledge. Interaction between the students and between the students and instructor is minimal and learning is passive. Furthermore, students cannot maintain attention and behaviour for long periods of time. Project-based learning (PBL), promotes students to develop knowledge and skills with their own activities (Biggs & Tang, 2007). Learning is organised around projects which are based on challenging questions or problems and students in their groups have an opportunity to design a project, make decisions, learn from each other, delegate responsibilities, meet deadlines and also work independently. Teamwork is at the core of PBL. In teamwork projects, students work collaboratively to solve an authentic problem, and thereby they develop both content knowledge and graduate attributes such as communication skills and problem solving (Bloxham & West, 2004; Dyball, Brown & Keen, 2007). They experience first-hand the positives and negatives of teamwork, the exposure to the viewpoints of others promoting reflection and discussion, observe group dynamics, develop interpersonal and communication skills. They also experience the negatives, interpersonal conflict amongst team members, personality clashes, unequal work-load distribution, incomplete tasks and the inequity of the process knowing that an overall mark will be given when project work load was unevenly distributed as was the quality (Spalding, Ferguson, Garrigan & Stewart, 1999; Walker, 2001). PBL is a student-driven, teacher facilitated approach to learning. It is an active learning process in which problem solving provides a context for students to apply prior knowledge from reading and/or classroom activities and pursue new knowledge by asking questions. The genesis of the project is an inquiry. The project is guided by an inquiry question that drives the research and allows

the students to draw on their existing knowledge. Instructors oversee the steps of the process and adopt a 'guide on the side' role in the process. PBL is commonly set up within a group setting involving teams of students and an instructor. The combination of PBL and group work facilitates the investigation of complex problems. In a company scenario, a group can be composed of all the main stakeholders: the CEO, financial controllers, Human Resource Manager, administrators, etc. PBL helps students see the contribution of all stakeholders in the company settings, their roles and responsibilities. Students engage in the problem by becoming one of the stakeholders defining the problem, investigating and solving it and through hands-on activities the students' interpersonal and communication skills are developed. PBL is a constructivist approach to learning where students learn by doing, they draw on past experiences and knowledge and use this to construct new knowledge, to problem solve real life issues (Chowdhury, 2016; Cross, 1998; 1999). Performance can be measured by rubrics with a critical aspect of this model involving self-evaluation and reflection. Students self-evaluate their own efforts, motivations, interests and productivity levels. They become critical friends by giving constructive feedback to each other which helps them become aware of their own strengths and improve on their interactions with each other. In the future, students must enter the workforce as engineers where they will be judged on their performance which includes not just outcomes, but also the ability to collaborate, negotiate, plan and organise. Implementation of PBL prepares students for this and equips them with the skills they need to be successful in the workplace (Bell, 2010).

### **1.1. Country profile of UAE**

The United Arab Emirates located on the Arabian Peninsula between Oman and Saudi Arabia is a relatively new nation state established in December 1971. It is one of six oil-rich countries that form the Gulf Cooperation Council (GCC). The others are Saudi Arabia, Oman, Kuwait, Bahrain and Qatar. All GCC countries are major exporters of oil and the region is considered to hold 45% of the world's oil reserves. In the UAE specifically, oil and gas wealth has transformed a desert state at subsistence level to a modernised country with a high GDP. It has faced many challenges in this transition. It has rapidly risen from a traditional tribal society at a subsistence level economy into a modern society and one of the most prosperous countries in the Middle East. This has been achieved through the development of a national identity over a tribal structure, an adherence to Islam, ensuring a high level of security while allowing for a liberal and relatively free society, preserving the culture whilst building a large multicultural society composed of predominantly expatriates. The countries non-oil sector is also slowly expanding mainly through the development of Dubai as a global centre of tourism and trade (Gallup, 2010). For the UAE to reach its goal of becoming a knowledge driven economy and to sustain growth, the availability of a highly trained national workforce is fundamental. The workforce in the UAE is a melting pot of different nationalities and cultures. Whilst the workforce heavily depended on expatriate labour in the past, this trend is now slowly changing in large measures due to workforce nationalisation (Emiratisation) since the early 1990s (Al Ali, 2008). This policy aims at reducing dependence on expatriate workers and creating job opportunities for nationals in the public and private sector. Employers are encouraged and incentivised to invest in UAE national employees with favourable treatment of nationals in recruitment, career advancement and remuneration.

## **2. Research methodology**

The data collection and analysis followed a mixed quantitative and qualitative approach. Mixed methods research is defined as the practise of collecting, analysing and combining qualitative and quantitative data within a single study for the purpose of producing a more holistic picture and understanding of a specific research area of study (Al-Waqfi & Forstenlechner, 2014; Creswell, 2003). Collecting both types of research data offers distinct yet complementary advantages (Onwuegbuzie & Leech, 2005). This research has involved three separate parts.

### **2.1. Feedback questionnaire of graduate students**

In order to understand the skills deficits of engineers in the workplace of UAE, 20 engineering graduate students (3+ years qualified), working in the public (18) and private sector (2) were given a questionnaire with a view to gathering information on their educational experience at university, their preferred method of learning, how the learning was assessed, and on reflection now as practising engineers how could the experience be improved. There is a gender imbalance within the respondents because of compulsory military training for all males under the age of 30. This somewhat skews the results. Questions were of the following type:

- Single answer questions defining gender and place of work (public or private sector)
- Multiple choice questions (with rating scales, 1–10) to list the ways taught at university, their learning style, how they were assessed, the types of learning experienced now in the work environment
- Likert scales to determine how useful the teaching and learning experiences at university compares to now in the work environment
- Open ended questions to reflect on how the classroom learning experience could be improved and could prepare students for the workplace

### **2.2. SWOT analysis of students taking BUSS 301 at Khalifa University**

Due to the exploratory nature of this research, the method of choice was to analyse a work assignment (Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis) which third/final year engineering students at Khalifa University singly conducted as part of an assessment on the *BUSS 301; Teaching and Learning Leadership by Simulation and Theory* which students take as an elective. This gave an insight into the students' self-awareness, challenges and difficulties. The sample size was 79 (three individual groups of students).

### **2.3. Semi structured interviews of students taking BUSS 301**

All students were invited to take part in the study. All 79 students were met through introduction at the start of a class and the background to the research was explained. Interview times were chosen based on the students timetable and students were contacted with a number of proposed times. Confidentiality was assured and all interviewees consented through signing a consent form. Interviews were recorded and subsequently transcribed. Themes emerging from the interviews were identified, coded and analysed. The questions chosen were related to the students' experience of teamwork and PBL in addition to the prominent themes emerging from the SWOT analysis. These included the following:

- High school favourite subject and the rationale for choosing the discipline chosen perceived long-term employment prospects with the major
- Perceived skills and characteristics industry seek in graduate students
- The experience of PBL
- The results from the SWOT analysis; the explanation behind the lack of trust reported and the anxiety experienced

Interview methods are recommended in developing countries where research respondents often prefer face-to-face interviews to questionnaires (Ahlstrom, Young, Chan & Bruton, 2004). Interviews also allow to clarify common themes arising from the qualitative data. Whilst large numbers of work assignments were reviewed and analysed, follow-up interview numbers were significantly less ( $N = 12$ ). Interviews also allowed us to explore students experience of PBL in depth, compare it to more traditional methods of teaching and assessment they have encountered and further explore its challenges with students, which emerged from the SWOT analysis.

## **2.4. Data analysis**

Simple descriptive statistics were employed to analyse the quantitative data. Questionnaires contained a range of types of questions such a multiple choice and Likert scale type questions as well as open-ended questions. Percentages were calculated with the multiple choice type questions and with questions that employed a Likert scale. Data collected from interviews were analysed whereby themes and patterns of opinion were identified. Exemplary quotes were chosen from the transcripts in order to illustrate the points made and foster better understanding.

## **3. Results**

### **3.1. Feedback questionnaire of graduate students**

The sample size for the feedback questionnaire was 20 (18 working in the public sector and 2 working in the private sector) whereas the ratio of participants was 2:18 (males:females). Eighty percent reported that their experience of learning was in the form of lectures delivered as PowerPoint slides and laboratory instruction. Fifteen percent reported problem-solving exercises employed in class and 5% learned online. When asked about the learning experience in University; how did they learn (*expressed as a percentage*): Reading (80%); Research (9%), Practise Problems (7%), Memorisation & Rote Learning (2%) and Application (2%). When asked about the types of assessment they experienced at University, (*expressed as a percentage*): Written Assignments (75%); Mid-term Exams (10%); Quizzes (9%) and Multiple-Choice Exams (6%). When asked about how useful the learning is they do now in relation to the job and how practical it is compared with university, 60% said their learning was more effective now in the work environment and 70% reported that they are now more active learners than they were in university. The two open-ended questions asked the graduates *on reflection* now, what is the best way to learn comparing their experience at university and to the present in the workplace.

Results in order of preference were (*expressed as a percentage*): Practising what I learned through participation in projects (70%); Reading followed by discussion followed by practise (25%) and Workshops and Mentoring (5%). When asked about how the University could prepare students for the workplace, a theme emerging in all the answers were to quote *exposure to real life, practice more than theories, equip students with skills instead of memorizations, less lecture, less slides, more storytelling relating to the real world and practice more than theories, more application sessions, relate the student learning with the learning objective and relate to the practical world, give real cases to solve/perform.*

### **3.2. SWOT analysis of students taking BUSS 301**

Seventy-nine student assessments were examined, and SWOT were analysed. These SWOT analyses were produced as a follow on to a PBL project and a Personality Test which graded students under a number of headings. The SWOT analysis was an opportunity for the students to discuss the results of the Personality Test as well as their concerns and explanations for the results that emerged. Students presented their SWOT as a table. Under each heading, students listed a number of attributes.

Breakdown of the results are as follows:

Gender distribution: 58 Female; 21 Male

#### **3.2.1. Internal strengths**

The key internal strengths listed by all the students are as follows: hardworking, reliable, organised, complete tasks, good at planning, remain calm in worst situations, like new experiences, can work in a team, communicate well, present well, follow rules and obey orders, not self-centred, punctual, have empathy and take responsibility.

### **3.2.2. External opportunities**

Themes:

- Graduating from Khalifa University, the top ranked University in the UAE
- Participation in competitions/experience gained through internship
- Graduating in a new field of engineering
- Family connections
- The impact of workforce nationalisation (Emiratisation)

### **3.2.3. Internal weaknesses**

Emerging themes:

Several themes emerged from these, largely related to working in a team and working together on a group project. These include

- Anxiety
- Lack of trust
- Difficulty having relationships
- Being an introvert
- Difficulty working in a team
- Taking orders and meeting deadlines

These are explored in more detail.

### **3.2.4. Anxiety**

Anxiety presented in 72% of the respondents. This anxiety arose from difficulties working in a group, especially with people they have never met before. *Difficulty communicating with strangers, poor at public speaking/communication skills, difficulty with relationships, feel superior, shy and do not speak even if I have something important to say, anxious, upset easily and feel angry, I dislike working in a team, I find teamwork overwhelming, I'm not a team player, like to work alone, do not like teamwork, I have difficulty public speaking and with social relationships, I am shy and do not speak even if I have something important to say.*

### **3.2.5. Fear of presenting within the group or to the class**

Many expressed a fear of presenting in front of each other and to the class. *I get nervous presenting in front of people I don't know.* Meeting deadlines, time management and preparing for exams were another source of anxiety. *Am nervous and anxious in relation to exams.* Many felt it difficult to cope in stressful situations. *I get nervous easily, I am afraid and I overthink about the future, Am fearful of many things in life, I get stressed easily, I scored high in anxiety.*

### **3.2.6. The social aspect of working in a team was a difficulty for many**

*I don't get involved in events, I am poor socially, I am poor socially, I only have a few close friends, I think of myself only and not others, I don't like large groups, I prefer working by myself, I can't take excuses when working in a team.* Many said that they were perfectionists and this made teamwork extremely challenging. *I'm a perfectionist and it takes me more time to complete a task, I take on others workload, Minor imperfections in work make me very anxious, I stress because I'm a perfectionist.*

### **3.2.7. Procrastination is presented as a weakness in 38%**

*I procrastinate most of the time, I become lazy and procrastinate, I procrastinate a lot and rush things in the end, I procrastinate a lot but I work well under pressure.*

### **3.2.8. Trust**

Trust emerged as a major theme. Students found it difficult to trust people in their team, unless they had worked with them before. Several quotations from different respondents are listed as follows: *I have trust issues, Difficulty trusting people outside of close friends and family, I have severe trust issues, I can't rely on people to do tasks; am impatient and don't like teamwork because of trust, I trust too easily and I get hurt, I have trust issues, I doubt people and see as dangerous, I perceive lots of things negatively at first, people and situations.*

### **3.2.9. External threats**

Emerging themes:

The main themes that arose under the heading of external threats were as follows:

- Surplus engineers and insufficient employment
- New fields of engineering (Nuclear, Aerospace and Biomedical) and their place in the employment market
- Working as a female engineer
- Lack of contacts in the field and few leadership roles
- The economic situation in the UAE

### **3.3. Semi structured interviews of students taking BUSS 301**

Twelve students agreed to take part and be interviewed. The breakdown was: 11 females and 1 male.

#### **3.3.1. Experience of project-based learning**

All students said this was not their first experience of PBL, their other experience was in a different class albeit with the same teacher. All students enjoyed the experience. It was described as *an amazing experience* unlike all the courses they took. *He teaches the concepts and when we learn the concepts, we actually apply and use them in our project, He doesn't just lecture, he gives us stories in a storytelling style. I like that. It helps me remember things.* One respondent described the classroom experience as *newer and a better way of teaching.* Many described working in teams as a source of anxiety and this course gave them the opportunity to *develop social skills.* *He gives us real-life examples which is great because whenever we have a concept I recall that example that he gave us and I can relate to the concept and theory.* For another student, he/she saw this type of learning as a welcome deviation from the norm. *I enjoyed this course because it's not about memorizing things which is the case with many of the other courses I take.* With other courses, the assessment element is criticised as not being fit for purpose. In relation to leadership skills, one student says *midterms and quizzes can't measure the types of skills required, you shouldn't memorize, it's something you should work on rather than take a test on it.* As described by another student, *leadership is not something you can learn in a book.* With other courses, *the problem is we have quizzes, they grade us on quizzes and terms so stuff like how to be a leader, you can't do a quiz on that and you only learn what you implement.*

Projects in this course are worked on in class and the instructor is there on the side to guide students, to answer questions, see progress, clear up misconceptions and visibly see project work in action. This is a sharp contrast to other project-based courses. These are described by students as inadequate because of the *poor if any follow up.* With other project-based courses, *we struggle to find a suitable time to suit us all.* By devoting class time to the project, the teacher *can see who is present and working, engaging with the project.* A different student compared this course other project-based courses: *With other projects, no one sits down with us and sees what we are doing, how we are working together, interacting, In this class, the instructor moves from table to table, he sees where we are in the project, asks have we any questions. He has the background information, he knows who is present, who is contributing, where we are at.* Compared with other projects, this is not the case. We

*meet with the Teaching Assistants or the professors when they are available, they say put all your questions together and save them all for one meeting. One particular student who particularly liked the project work and spoke about it with passion described it as We felt there that we were in the middle of the situation, actually the students took the situation on and they were like participating from their hearts. Projects are an integral part of course work in all courses but the PBL approach and teamwork experienced in this course was different. It gives you a lot of experience with people and I find that really important, the next course when I have to work in a team I will be better prepared, In this course we get to express ourselves more. For one particular student, they described themselves as selfish and identified themselves as being a potentially poor leader. When I read the bad examples of leadership in the book I connected with some of them. I can relate to them. That has been an eye opener. They described the course as a vehicle for self-awareness and self-development. Taking this course, I have seen so many different types of leading in so many different ways. The answer to my problem is to lead the right group and how to develop my own leadership style. I can do that and I never knew I could do that. I feel there is a place of development within me that I never knew existed. The problem with other courses was the reliance on quizzes as a form of assessment which were seen as an inadequate and poor reflection of students learning. I realize this course is not only on leadership and HR but the skill of critical thinking. The groups were chosen by the students themselves. This worked well for many students, especially those that had worked together before. Our group in the leadership course is a good group, everything was divided equally, I am lucky, they are all my best friends and I know them and we decided to be a group. For others, the experience was not as positive. The anxiety was evident from the responses. I can't do everything myself, My group, they are really smart students but they have procrastination issues, I am the person who nags them everyone all the time. Compared with other courses, the assessment in this course was based on individual assessment and group work. This was welcomed by students.*

### **3.3.2. Graduate attributes/generic or soft skills**

Students were asked what attributes companies/industry/research environment desire in new graduates. All students in the group said communication skills were a key factor and being able to work in a team. *A student should have a very good leadership skill, working skills because at work of course you will be working in a group. You should know how to deal with people. These are the most important things, If its research, they probably look for teamwork and adaptability. I think it's the most important thing because many things go wrong, and you need to work through that, go with it, stop complaining, and stop blaming other people. You get that experience in internships and in the university. In Biomedical engineering all we do is based on project work. They shuffle teams, so you get to work with everyone and you have to learn to adapt with every single person you work with. Again, another respondent stressed the importance of teamwork and the development of critical thinking skills. Probably one of the most important ones is critical thinking and teamwork. In the research fields you don't work on your own. You have a team of people, not necessarily the same background, and then you gather the thoughts all together and approach one problem. Teamwork is probably one of the most important characteristics. There were mixed views about the importance of the GPA scores. For a number of respondents, the GPA score was most important followed by experience of taking part in competitions. One respondent felt they don't really care about the GPAs. They want a person who knows what he is doing, someone who has the technical skills. One respondent said of companies, they are looking at the personality of the person, they should be confident, a good listener, listening to others rather than forcing the point. I believe the employee should be the best in the job and not just have a quiet life, he should do more than he is asked to get the best outcome of the company. In agreement, another respondent stressed the value of leadership skills. You have to be a great leader, I think they won't accept weak people right now, by weak, I mean followers, people who only follow. They want people with initiative, who get on with things and are moving forward. They can get this from an interview by giving lots of scenarios and see how the person would cope.*

#### 4. Discussion

Assessing the teaching, learning and assessment experiences of graduate students, 80% of their teaching was classic didactic, chalk and talk with overemphasis on presentation slides, with little or no interaction between themselves or between them and the teacher. The instructor was the sage on the stage controlling the learning environment and delivering the presentation to a group of disengaged students. The learning was passive, and assessment was largely in the form of written assignments which were solitary endeavours with much of their time reading and memorising from books with the aim of regurgitating the same material in a summative assessment. They described the present work environment as alien to the student class room set up with collaborative, team-based activities where being able to communicate effectively within the team and to other teams is paramount. Graduate students expressed a strong need for more experiential learning, use of real-life concepts, tools and experiences. Much research has examined the graduate attributes desired by employers in new hires. The atypical attributes listed as follows: GPA, communication skills, research experience, ability to work in a team, engineering mentality and subject understanding. Communication skills scored 57% followed by the ability to work in a team (37%) and then subject understanding. When asked what skills need to be developed in new hires post-graduation, communication skills score the highest, followed by technical skills and the ability to work in a team (Saleh et al., 2017). PBL is effectively a 'learning by doing' approach founded on the use of a problem as a motivation tool for learning; students drive activities in creating a final product that addresses the questions (Blumenfeld et al., 1991). In PBL, students are encouraged to use real world concepts, tools and experiences as they work in groups. PBL is acknowledged as a collaborative, progressive, student centred, interactive, active and deep learning approach particularly suited to engineering students where problem solving and project work in teams is an integral element of the work environment. This is expressed by the graduate students when asked to reflect on the University experience. They yearned for *exposure to real life and real cases to solve/perform and practice more than theories* with less emphasis on lecture-based classes, *less lecture, less slides and more storytelling relating to the real world*. They also want to move from memorisation of facts *to equip students with skills instead of memorization* where the learning is more experiential. The students of today are the millennial students, the digital natives who are very different to previous generations. Research has demonstrated that their learning preferences are very different. The ideal learning environment is less lecture, more use of multimedia, collaboration with peers and teamwork through the use of problem and PBL practises where students are encouraged to construct knowledge rather than take it in as it is being disseminated.

##### 4.1. Project-based learning in Khalifa University

In the Middle East, engineering is one of the most sought-after undergraduate courses producing thousands of graduates each year. Khalifa University of Science and Technology is the highest ranked university in the United Arab Emirates and the second highest in the GCC. It is a co-educational campus whereas most universities in the UAE are gender-segregated. It is a millennial university with a long-standing engineering faculty and newly formed College of Science and Arts and in the near future a Faculty of Medicine and Health. Engineering students taking BUSS301 drive their own learning through inquiry using a PBL approach. They work collaboratively, listen, problem solve, manage their time, meet deadlines and take on the role of informed future leaders. An insight into students' experience of PBL was gained through SWOT analysis which they completed as part of an assignment followed by semi-structured interviews. Where the experience of PBL surfaced in the SWOT was under Weaknesses and Threats. Under the heading Weakness, strong anxiety emerged around working in a team, communicating with team members, trusting people in the team to do the work assigned to them within the time frame and to a high standard. Teamwork was described as *overwhelming*, they described themselves as *not team members* and a desire to work alone. As the majority of students were female, 29% described themselves as introvert. To quote one respondent *I like to work alone, I do not like teamwork* and another *I am shy and do not speak even if I have something important to*

say. The social aspect of teamwork was a major difficulty for many. To quote one respondent *I only have a few close friends, I don't like large groups* and another *I can't take excuses when working in a team*. These comments are not atypical throughout Arab culture where there is still a heightened awareness of male/female separation. For a number of respondents, they described themselves as perfectionists and this reliance on other members of the group to complete tasks to a high standard was extremely challenging. To quote *I take on others' workloads*. One respondent said they would rather take on the workload of others because they knew then the work would be a high standard. *Minor imperfections in work make me very anxious*, and another, *I stress because I'm a perfectionist*. Procrastination is presented as a weakness in 38% from the SWOT analysis. This may contribute to the high level of anxiety expressed by students working in a team. To quote two of the students *I procrastinate all the time* and *I become lazy and procrastinate*. Trust was another theme emerging from both the SWOT analysis and the qualitative data collected from the interviews. High anxiety levels were for many a result of not knowing and trusting fellow team members. To quote one respondent, *I have difficulty trusting people outside of close family and friends* and another *I have severe trust issues, I can't rely on people to do tasks, am impatient and don't like teamwork because of trust*. Another respondent said regarding trust *I have trust issues, I doubt people and see as dangerous*. Again, social caution is reflective of Hofstede's observation that Arabs comprise a 'high-context' culture. The semi-structured interviews were chosen as an additional research tool to probe further the issues raised in the SWOT analysis, namely around anxiety and trust and to explore students experience of PBL. All students experienced PBL in a different course albeit with the same lecturer. It was the impetus to take this course and a number of interviewees chose to be interviewed because they wanted to express their gratitude and passion for this type of learning. It was described as an *amazing experience* and very different to other courses they have taken or are taking. The students enjoyed the experience describing it as *newer and a better way of teaching as a mechanism to develop social skills*. Projects are an integral part of course work in all engineering courses but the PBL approach and teamwork experienced in this course was different. *It gives you a lot of experience with people and I find that really important, the next course when I have to work in a team I will be better prepared, In this course we get to express ourselves more*. The problem with other courses was the reliance on quizzes as a form of assessment which were seen as an inadequate and poor reflection of students learning. *I realize this course is not only on leadership and HR but the skill of critical thinking*.

## 5. Conclusion

When students were asked about what attributes employers look for in future employees, soft skills like teamwork, communication skills, collaboration, adaptability, leadership skills and critical thinking were acknowledged by all as being important, teamwork being the most important because of the existence of team projects in engineering. They also commented on the need for experience through internship and/or volunteering. While experience can be difficult to attain, the soft skills can be achieved through the use of PBL in the classroom arena. Communication skills are the most important skill that needs to be developed after graduation in the industry market (Saleh et al., 2017). While students acknowledged the need for such skills, the same students expressed a fear of working in groups, speaking up, trusting others in the group, presenting to others in the group and to the class. It is clear that students found the learning experience experiential and although daunting at first, their learning was evident. Any innovation implemented will have challenges and the distress experienced by students around working with others and the unfairness around equal marks when the work load was not distributed fairly will arise. With good resource management and practise the implementation should get easier as students will be more aware of what is expected of them.

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