Skills Gap Analysis: Satisfaction and Expectation of Engineering Educators in Malaysia

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Abstract: Skills mismatch between graduates and industry needs is a prolonged issue. The high unemployment rate among graduates indicates that the skills possessed by the students in higher learning institutions and the industrial needs are not in the equilibrium. This scenario has negative impacts on the country in economic, social and political aspects, which should not be underestimated by the government. To have a better overview regarding this issue, skills gap analysis has to be done to identify the missing skills among the graduates. Previous studies only reported skills gap analysis based on industry perspectives. This study was conducted to explore and quantify the gaps from engineering educators' perspectives. A survey on satisfaction and expectation of engineering educators from Malaysian public universities toward engineering graduates was conducted. Satisfaction and expectation were applied to measure skill gaps of 18 non-technical skills that are relevant to engineers. The research findings demonstrated that 50% of engineering educators are only contented through the skill levels of their engineering graduates. On the other hand, all skills were considered considerably essential for engineering graduates according to the educators. Skills gap analysis revealed that written communication skill exhibited the worst mean gap, whereas the lowest mean gap was displayed as the best score by critical thinking skill (0.41). Findings from this survey can be used as a guidance for industries, institutions and graduates in helping one refines and defines skills needed for now and in the future, making employees aware about the critical skills they need to grow to excel in the working field

Key Words Skills Gap; Non-technical Skills; Satisfaction; Expectation; Engineering Educators

I. INTRODUCTION

Engineers are seen as an asset and perform an essential role in transforming and supporting Malaysia into a high-income economy country. Engineering training is required to transform and arrange engineering graduates to survive in the fast-changing world. It is undeniable that excellent academic result is a ticket for graduates to be employed in a company. Nevertheless, the ability of an engineering graduate to work and compete in the workplace does not rely solely on the knowledge gained during university studies, but also their ability to master non-technical skills. This has been shown by previous studies that the industry prefers to select engineering graduates who excel in academics as well as professional skills (Ellis & Petersen, 2011; Farr & Brazil, 2010; Hillmer, Wiedenbrueg, & Bunz, 2012; Kumar & Hsiao, 2007; Low, 2006; Markes, 2006; Mohd Zuhdi, Mohd Nizam, & Ruhizan, 2017; Patacsil, Fernandez, & Cenas, 2017; Tong, 2003; Vadivu, Bala, & Sumathi, 2015; Woodward, Sendall, & Ceccucci, 2010). Furthermore, it was found by previous studies that some employers admitted that engineering graduates possess excellent technical skills, but lack of professional skills (Mahathir, 2007; Mustapha, 2002; Tong, 2003; Yuzainee et al., 2009) (Dagget, 2010; Ministry of Higher Education, 2012). Moreover, in the real working world scenario, most employers in the industry hesitate to assign prominent position or task (i.e. project managers) to fresh graduates since they have more technical knowledge than non-technical skills including leadership and ethics, which enforced them to start working at clerical level. Therefore, it is not a surprise that many complaints and negative comments from various industries are about the freshly trained graduates. Lacking in terms of necessary skills makes it difficult for the graduates to meet the recent job requirements and professional expectations (Bakar & Hanafi, 2007; Mai, 2012; Martin, Maytham, & Case, 2007). Therefore, they were not selected to fulfil their positions when they do not satisfy the industry requirements.

Soft skills or non-technical skills are the abilities to be required to reduce the numbers of unemployed graduate. The use of terms in non-technical skills is different across continents. Its sometimes refers to general skills, employability skills, essential skills, core skills, life skills, transferable skills, fundamental skill, necessary skills, enabling skills and soft skill. Nevertheless, it focuses on the same aspect, which is the skills required by graduates to work other than technical skills. The deficiency of dominancy about soft skills features is the main factor for graduates to not get a job after graduation (Esa & Jamaluddin; 2014). This scenario is likely to be due to the attitude of the students

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who do not care about the need for the skills that are important to be mastered today. It has been made evident by the study of (Murali & Rajaram, 2015) discovering that the domain knowledge obtained the highest votes from 359 out of 779 engineering students. In sequence, a study by (Nooriah & Zakiyah, 2015) on graduates from UUM and USM found that only 35.6% of the students acknowledged that they know the forms and types of skill required by the employers. Whereas 18.9% of the students did not know them, and the majority of students (45.5%) were unsure of the skills demanded by the employers. Based on the findings of these two studies, this situation is a concern because, at this time, students should have understood and known the importance of mastering non-technical skills needed by the industry rather than technical skills or knowledge. Emphasis on the mastery of non-technical skills needs to be focused more effectively to face the increasingly sophisticated technology flows.

When graduates have the skills that match the needs of the industry, their chances of being employed will increase, which indirectly gives a positive impact on the unemployment rate of the country. However, the problem of skills incompatibility faced by graduates is still a significant problem often debated by various parties. The issue of skills mismatch is closely related to the unemployment rate of a country. Accordingly, the unemployment rate in Malaysia is between 1.5%- 5% three decades ago. Overall, the unemployment rate for graduates is still under control in a range of 10%. Though the unemployment rate in Malaysia is considered low compared to advanced countries, this issue cannot be ignored. Skills mismatch can occur not only regarding the supply and demand of the existing skills but also regarding today's basic skills and future skills requirement. Besides, the phenomenon of graduates' excess supply is getting serious when they could not position themselves in the industry, causing an imbalance in the job market. This situation has negative impacts in all aspects, including economic, social, and political, which should not be underestimated by the government.

Economically, engineer's unemployment is a wastage of national resources when the country is not receiving an appropriate return on its high investment in the higher education system (Alya Ilyana, 2018). Furthermore, the country's economy is forced to bear the unprofitable investment rate due to unemployment. The situation becomes even more alarming as the nation's vision of attaining a status of developed state is increasingly difficult since the graduates are unemployed and fail to earn a steady income.

Based the above scenario, it is significant for higher education institutions (HEIs) and industry to play significant roles to prepare and equip their students with soft skills apart from technical knowledge. To achieve this, understanding and requirement of the required skills must be met by all involved parties including HEIs, employers and graduates to reduce the skills gap as well as the unemployment rate among graduates especially in engineering.

This paper is structured as follows: brief background and introduction about the significance of non-technical skills among engineering graduates are provided in the first section. The next section summarizes similar studies. Afterward, Section 3 shows the research methodology, for data collection of the study. Section 4 presents the information from the questionnaire and analysis of outcomes, followed by a discussion of the findings in Section 5. Finally, conclusions from this paper are drawn in Section 6.

II. LITERATURE REVIEW

The skills gap reviewed from previous studies in the engineering field. This is considered as the difference among the market requirement (demand) and the current skills provided by training or HEIs (supply).

A. Skills gap between higher learning institutions and industry requirements

As generally known, skills mismatch between graduates and industry needs is a prolonged issue. It may occur because of two factors; students in training and learning institutions are not provided with the right skills and knowledge as well as the imperfect labor markets (Cedefop, 2014). The high unemployment rate among graduates indicates that the skills possessed by the students in higher learning institutions and the industrial needs are not in the equilibrium. It is the point where an organization can no more develop and continue competitive as it cannot fill critical jobs with employees who have the right knowledge, skills and abilities (ASTD, 2012).

The findings from previous studies indicated a substantial gap amongst the skills taught and assessed to the undergraduate engineering students by HEIs and the skills expected by professional engineers and industry practitioners from the graduates (Chithra, 2013; Domal, Stappenbelt, & Trevelyan, 2008; Jainudin, Francis, Tawie, & Matarul, 2015; Llorens, Llinas-Audet, Ras, & Chiaramonte, 2010; Nair & Patil, 2008; Nair, Patil, & Mertova, 2009; Patacsil et al., 2017; Patil, 2005; Radcliffe, 2005; Rademacher, Walia, & Knudson, 2014; Ramadi, Ramadi, & Nasr, 2015; Royal Academy of Engineers, 2010; Tong, 2003; Wellington, Thomas, Powell, & Clarke, 2002; Wong & Tsang, 2009). Table 1 displays the differences between the importance of skills implemented by HEIs with the needs of industry based on previous studies.

Table 1. Differences between the importance of skills by HEIs and the industry

Authors	Year	Importance of skills	
		HEIs	Industry
(Tong, 2003)	2003	Scientific theories and technical knowledge	Practical results

(Domal et al., 2008)	2008	Technical knowledge	None of functional professional engineering practice are learned at university
(Nair & Patil, 2008)	2008	Communication skills, decision-making, problem solving, leadership, emotional intelligence, social ethics	Oral communication, interpersonal skills, written communication
(Wong & Tsang, 2009)	2009	a) 59%: adequate in English b) Well performed in problem solving	a) Only 39%: adequate in English b) Adequate in problem-solving
(Nair et al., 2009)	2009	Communication skills, decision-making, problem solving, leadership, emotional intelligence, social ethics	Oral and written communication skills, capacity to learn, cooperation, teamwork, interpersonal skills
(Llorens et al., 2010)	2010	Information research skills, ability to learn, teamwork, flexibility, planning skills	Teamwork, capacity to learn, problem solving, customer-oriented
(Chithra, 2013)	2013	Technical skills	Behavioural skills
(Jainudin et al., 2015)	2015	a) Weak in oral and written communication skills b) Weak in application of knowledge	Good performance in attendance, punctuality and attitude, cooperation, safety
(Ramadi et al., 2015)	2015	-	Time management, cooperation, communication skill, personal accountability skill
(Patacsil et al., 2017)	2017	Ranked skills: i) Teamwork (95.2%) ii) Leadership (93.0%) iii) Communication skill (92.6%)	Ranked skills: i) Teamwork (97.4%) ii) Leadership (97.4%) iii) Communication skill (94.8%)

Table 1 clearly shows that the importance and implementation of skills by HEIs are different from those of the industry. Based on the findings, it can be determined that HEIs emphasize the mastery of theory, which is entirely different from the practices in the workplace that emphasize more on practical results. In terms of skills mastery, HEIs focus more on technical skills than generic skills. For instance, the findings from previous studies (Llorens et al., 2010; Nair & Patil, 2008; Nair et al., 2009; Wong & Tsang, 2009) revealed that HEIs assume that their engineering graduates possess a high level of skills; nevertheless, this is contradicted with the perspective of the industry. Besides, the emphasize given on the mastery of every skill by HEIs was seen to be lower than what was expected by the industry. This suggests the existence of a significant gap in the development of skills between the HEIs and the industry. According to (Mardam-Bey & Saran, 2008), globalization has caused a change in skills and competencies required from engineers recruited by industries and employers. Today's graduates deal with an increasingly globalized, automatized, virtualized, networked and flexible world to compete for employment on a global market. This way, new competencies and skills will be needed more.

Furthermore, some previous studies have discussed employer's dissatisfaction towards the generic skills or professional skills possessed by graduates (Blom & Saeki, 2011; Hassan et al., 2007; Lattuca, Terenzini, & Volkwein, 2006; Mohamad Idham, Asliza, Wan Nor Syazana, Wan Effa, & Talib, 2014; Mohd Shamsuri, Anidah, Zanariah, & Izaidin, 2013; Mustapha, 2002; Nguyen, Yoshinari, & Shigeji, 2005; Tong, 2003; Zaharim, 2008; Zaharim, Md Yusof, Omar, Mohamed, & Muhamad, 2009a) (Table 2).

Table 2. List of previous studies on employer's dissatisfaction towards skills development of engineering graduates

Authors	Year	Skills
(Mustapha, 2002)	2002	Communication, interpersonal, critical thinking, problem solving and entrepreneurial
(Tong, 2003)	2003	Interpersonal communication skills (4.6 out of 10.0)
(Nguyen et al., 2005)	2005	Lack of initiative, problem solving
(Lattuca et al., 2006)	2006	Ability to understand contexts and constraints
(Hassan et al., 2007)	2007	Oral and written communication skill
(Zaharim, 2008)	2008	Entrepreneurial skill
(Nair et al., 2009)	2009	Communication, problem solving, leadership, social ethics
(Zaharim et al., 2009a)	2009a	Teamwork, communication, problem solving
(Blom & Saeki, 2011)	2011	Technical skill, problem solving
(Mohd Shamsuri et al., 2013)	2013	Communication skills, leadership, critical thinking, creativity
(Mohamad Idham et al., 2014)	2014	English proficiency

Based on Table 2, communication skills displayed the highest frequency (7 from 11 studies, 58.3%). This suggests that the majority of the employers stated their

dissatisfaction on the level of communication of the engineering graduates. This was followed by problem-solving skill (50.0%), critical thinking, leadership, entrepreneurial (16.6%) as well as interpersonal, technical skills, teamwork, initiative and creativity (8.3%). Based on this finding, it can be summarized that communication skill is the most significant skill required by the industry. This is in line with the outcome by (Mohd Shamsuri et al., 2013) through a survey review demonstrating 68% of managers who named communication skill as the most essential skill in a job application.

Previous researchers have attempted to study and analyze the skills set for engineering graduates to perform in the fast-changing borderless world. Moreover, the analysis study of the skills gap has been conducted by many researchers from several countries around the world. Despite the wide availability of evidence indicating a significant gap between the skills required for engineering graduates, most of these studies focused on the perspective of employers or graduates. It is undeniable that employers and engineers play an essential part in the development of skills; nevertheless, the perspective study from engineering lecturers are also important. This is because engineering lecturers are those who are responsible for instilling the engineering skills within the students during their study period at institutions of higher learning. Furthermore, some of the studies from researchers in Malaysia have been published for more than ten years, making the information dated. Table 3 shows a list of past studies to associated with this study.

Table 3. The list of past studies related to the analysis study of the skills gap in the engineering field

Year	Researchers	Sample	Country
2003	(Tong, 2003)	Employers in engineering firms	Malaysia
2008	(Zaharim, 2008)	High ranking personnel in the engineering firm	Malaysia
2009	(Zaharim, Omar, Basri, Muhamad, & Mohd Isa, 2009c)	Human resources managers	Malaysia
2009	(Nair et al., 2009)	Employers	Australia
2010	(Llorens et al., 2010)	Employers and managers	Spain
2011	(Blom & Saeki, 2011)	Employers	India
2013	(Chithra, 2013)	Students and employers	India
2014	(Rademacher et al., 2014)	Managers and hiring personnel	United States and Europe
2015	(Ramadi et al., 2015)	Managers in engineering firms	MENA
2015	(Vadivu et al., 2015)	Experienced HR managers, Managing Directors and Project Managers	India
2017	(Patacsil et al., 2017)	OJT engineering students and supervisors	Philippines

Therefore, this study was aimed at investigating and quantifying the gaps from engineering educators' perspectives. To calculate the skills gap, this study explores the satisfaction and expectation level of engineering educators towards the skills possessed by the engineering graduates. As such, this study advocates the following questions:

- Which skills do engineering educators consider important for engineering students to pursue?
- How satisfied are the educators with the skills possessed by engineering graduates?
- Do gaps exist between the satisfaction and expectation of skills perceived by the engineering students? If so, how large are these gaps?

III. METHODOLOGY/MATERIALS

This study has to apply a descriptive research design with a quantitative approach. A descriptive questionnaire was planned and utilized to observe the perception and importance of skills needed for engineering graduates as perceived by the engineering educators.

A. Research instrument (skills selection)

Based on the previous research in the engineering field; a questionnaire was established based on that developed and used by earlier researchers in (Blom & Saeki, 2011; Zaharim et al., 2009c). The questionnaire was modified and refined in line with the objectives and requirements of this study. The survey questionnaire comprises into two sections; Part A and Part B. Section A comprises of six items related to gender, engineering field, academic qualification, position, work experience and university. Part B consists of two sections on the level of perception and expectation of engineering educators towards 18 engineering skills compiled from previous studies (Blom & Saeki, 2011; Chithra, 2013; EAC, 2012; Murali & Rajaram, 2015; Patacsil et al., 2017; Ramadi et al., 2015; Shyamalee, Wickramasinghe, & Dissanayake, 2007). Table 4 shows a list of 18 skills used in the survey.

Table 4. 18 Non-Technical Skills for Engineering Graduates

A	Written communication (Engineering reports, technical writing, essays, peer review)
B	Verbal communication (Presentation, role play)
C	Teamwork (Role in and diversity of team)
D	Problem solving (Problem identification, formulation and solution)
E	Lifelong learning (CPD/ Continuous learning)
F	Management (Time, change, informational, finance, project)

G	Creativity (identifies new approaches to problems)
H	Flexibility (responds well to change)
I	Integrity (understand/apply professional and ethical principles to decisions)
J	Critical thinking
K	Leadership
L	Professionalism
M	Entrepreneurship
N	Organization skills
O	Punctuality
P	Tolerance
Q	Approachability
R	Reliability

The respondents were asked to rate their satisfaction level (ranging from not satisfied to extremely satisfied) and their expectation level (ranging from not important to extremely important). During data analysis, the answers fitting to the first groups were named as 'Important', whereas those belonging to the last two groups were called as 'Not important'. This simplification was also applied for the satisfaction level of engineering educators.

B. Population and sampling

A purposive and stratified random sampling method was employed in this study. The population in this research included engineering educators from public universities in Malaysia. Accordingly, in 2018, the overall numbers of engineering teachers' public universities Malaysia were 2050 people. The sample size was calculated using the table proposed by Krejie and Morgan (Krejcie & Morgan, 1970). Based on this table, the sample of this study involved 322 people. Justification for the selection of engineering lecturers as the respondents of this study is because they are individuals responsible for evaluating students' performance throughout their research at the university. Furthermore, they are the closest and most reliable individuals to provide the correct and accurate feedback on academic achievement and skills possessed by the students.

C. Data collection

In this study, data collection adopted the use of an online questionnaire via Google forms. The online survey was selected as it is easy to manage and organize the data collected from the respondents. For initial contact, the respondents' name, responsibility and contact email address within their respective faculty and department were determined. An invitation email together with permission letter and link address was distributed to lecturers based on the identified list. The timeframe for data collection was within two months. To boost the response rate and to ensure timely completion of the questionnaire, the first friendly reminder was sent to the respondents two weeks after the initial mailing via email. These procedures yielded a response rate of 30%. Another two weeks after that, second and last friendly reminders were sent; this resulted in a further 15% response rate. Despite the shortcomings, the participation number of 144 was considered to be within the range of respondents based on previous studies.

IV. RESULTS AND FINDINGS

A. Demographic profile

Overall, there were 144 engineering educators who responded to the survey. All six demographic profiles were discussed in the table below.

Table 5. Demographic Profile of Engineering Educators

Profile		Frequency	Percentage
Gender:	Male	96	66.7
	Female	48	33.3
Engineering field:	Civil engineering	19	13.2
	Electrical engineering	19	13.2
	Electronic engineering	20	13.9
	Mechanical engineering	49	34.0
	Chemical engineering	12	8.3
	Industrial engineering	3	2.1
	Aerospace engineering	5	3.5
	Other	17	11.8
Academic qualification:	Master	26	18.1
	Doctor of philosophy	117	81.3
Job title:	Lecturer	36	25.0
	Senior lecturer	71	49.3
	Associate professor	29	20.1
	Professor	5	3.5
	Ingenieur (Ir)	1	0.7
Work experience:	Less than 5 years	23	16.0
	6-10 years	40	27.8
	11-15 years	41	28.5
	More than 15 years	40	27.8
University:	USM	14	9.7
	UPM	11	7.6
	UPNM	7	4.9
	UniMAP	33	22.9
	UMP	8	5.6
	UTeM	32	22.2
	UTHM	28	19.4
	UiTM	1	0.7
	UTM	9	6.3

B. Educators' satisfaction

Skills were ranked based on educators' percentage of satisfaction to determine the satisfaction level of engineering educators towards the skills of engineering students. Overall, 44% of educators were only slightly pleased with the features of their engineering students' skills. The educators were mostly satisfied with problem-solving skills. Meanwhile, they were most dissatisfied with

flexibility skills, which scored only 34.0% satisfactory level.

Table 6. Educators' satisfaction on skills of their engineering students

Skills	Not satisfied	Somewhat satisfied	Satisfied
A	29 (20.1%)	85 59.0%)	30 20.8%)
B	23 (16.0%)	79 54.9%)	42 29.2%)
C	10 (6.9%)	49 34.0%)	85 59.0%)
D	16 (11.1%)	71 49.3%)	57 39.6%)
E	23 (16.0%)	62 43.1%)	59 41.0%)
F	25 (17.4%)	70 48.6%)	49 34.0%)
G	19 (13.2%)	63 43.8%)	62 43.1%)
H	17 (11.8%)	62 43.1%)	65 45.1%)
I	15 (10.4%)	55 38.2%)	74 51.4%)
J	21 (14.6%)	71 49.3%)	52 36.1%)
K	12 (8.3%)	56 38.9%)	76 52.8%)
L	18 (12.5%)	61 42.2%)	65 45.1%)
M	30 (20.8%)	61 42.2%)	53 36.8%)
N	19 (13.2%)	61 42.2%)	64 44.4%)
O	39 (27.1%)	62 43.1%)	43 29.9%)
P	12 (8.3%)	58 40.3%)	74 51.4%)
Q	12 (8.3%)	49 34.0%)	83 57.6%)
R	12 (8.3%)	64 44.4%)	68 47.2%)

C. Educators' expectation

In this section, engineering lecturers were required to show the level of importance and able 7 shows the results. Based Table 7, all skills were rated more than 85% (important) except for entrepreneurial skill with 70.8%. Nevertheless, all skills in the questionnaire were still considered as important by the engineering educators. Reliability skill (97.9%) and integrity (97.2%) were found to be the most important for graduates.

Table 7. Educators' expectation on the skills of their engineering students

Skills	Not important	Somewhat important	Important
A	0 (0.0%)	8 (5.6%)	136 (94.4%)
B	0 (0.0%)	4 (2.8%)	140 (97.2%)
C	0 (0.0%)	8 (5.6%)	136 (94.4%)
D	0 (0.0%)	4 (2.8%)	140 (97.2%)
E	1 (0.7%)	16 (11.1%)	127 (88.2%)
F	0 (0.0%)	8 (5.6%)	136 (94.4%)
G	0 (0.0%)	11 (7.6%)	133 (92.4%)
H	0 (0.0%)	8 (5.6%)	136 (94.4%)
I	0 (0.0%)	4 (2.8%)	140 (97.2%)
J	0 (0.0%)	11 (7.6%)	133 (92.4%)
K	1 (0.7%)	20 (13.9%)	123 (85.4%)
L	0 (0.0%)	5 (3.5%)	139 (96.5%)
M	6 (4.2%)	36 (25.0%)	102 (70.8%)
N	1 (0.7%)	13 (9.0%)	130 (90.3%)
O	2 (1.4%)	4 (2.8%)	138 (95.8%)
P	1 (0.7%)	7 (4.9%)	136 (94.4%)
Q	0 (0.0%)	8 (5.6%)	136 (94.4%)
R	0 (0.0%)	3 (2.1%)	141 (97.9%)

D. Skills Gap Analysis

A skills gap analysis was obtained by measuring the mean average difference between the perception and importance of skills perceived by the engineering graduates from engineering educators' perspectives. Based on previous studies by (Patacsil et al., 2017; Zaharim et al., 2009c), the formula used to calculate the mean gap is as follows:

$$\text{Mean Gap} = \frac{[(\text{Expectation})_i - (\text{Perception})_i]}{n}$$

Where

i refer to the *i*th respondent

p refers to the *p*th respondent

n refers to the total number of respondents

A higher mean gap value represents a more significant discrepancy between what is expected, and their performance as perceived by educators. A gap analysis of the attributes revealed differences between importance-satisfaction ratings ranging from 0.41 to 0.93. The attribute that demonstrated the highest mean gap (the worse score) was written communication skill. Meanwhile, the lowest mean gap (the best score) was obtained by critical thinking skill. Figure 1 shows the value of the mean gap calculated for this study. Moreover, from the analysis, the top 10 skills were identified and ranked as follow: 1) written communication skill;

2) punctuality; 3) verbal communication skill; 4) management skill; 5) leadership skill; 6) problem-solving skill; 7) professionalism; 8) creativity; 9) lifelong learning and 10) flexibility (Table 8).

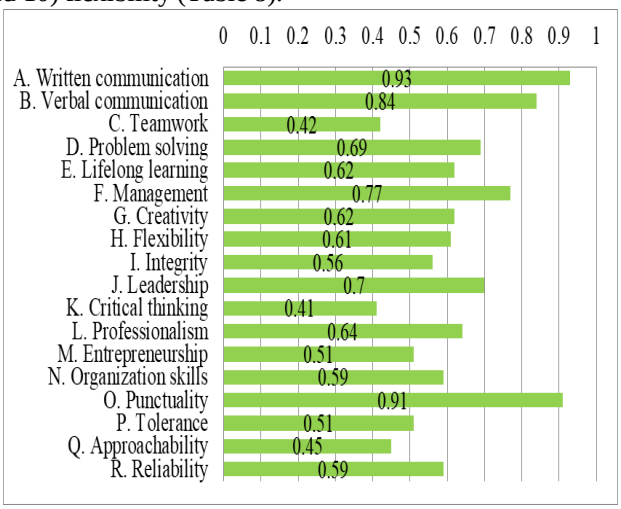

Fig 1. Mean gap between satisfaction and expectation

Table 8. Skills ranked

Rank	Skill	Gap value
1	Written communication	0.93
2	Punctuality	0.91
3	Verbal communication	0.84
4	Management	0.77
5	Leadership	0.70
6	Problem solving	0.69
7	Professionalism	0.64
8	Creativity	0.62
9	Lifelong learning	0.62
10	Flexibility	0.61

V. CONCLUSION

This study has been conducted to examine the level of satisfaction and expectation the skills of engineering graduates in public universities across Malaysia. The main focus of this study was on identifying whether or not there is an important difference satisfaction and expectation from the engineering lecturers' perspective. This study was also aimed at quantifying the skills gap to identify the rank of skills that should be addressed by all involved parties in developing the skills of engineering graduates.

The survey has been conducted on engineering lecturers at public universities throughout Malaysia. Data collection method through questionnaires was distributed through email and google form links. The respondents have been asked to rate their perception towards satisfaction and expectation level of 18 engineering skills identified from previous studies. Findings from this study reported that most of the engineering educators were pleased with the skills perceived by the students. Also, the result showed that reliability and integrity were given a top priority by the engineering educators toward their respective students.

About skills gap, the analysis found that written communication skill exhibited a significant skills gap. In this study, written communication skill includes writing engineering reports, technical writing, essays and peer review. Engineering graduates may be of the view that good writing skills are less important than other skills. They take it easy in producing good and complete writing as they think other artefacts like dimensioned project materials can give more meaning than reports and essays. The reality is that good writing skill is very important as it ensures that customers or employers can get an in-depth understanding about a project.

Based on the findings of this study, it can be seen that there is a strong need for engineering graduates to be aware and give their attention on the professional or non-technical skills required by the industry. Engineering educators should provide the current information about the real scenario happening in the working world besides moulding and furnishing their students with appropriate and relevant skills so that they are equipped to face the challenges and responsibilities toward themselves and their country.

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