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MEASURING STUDENT SATISFACTION TOWARDS ENGINEERING POSTGRADUATE PROGRAMME IN UKM

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Abstract

This paper aims to report on the student satisfaction measurement done for Masters of Engineering by course programmes in Universiti Kebangsaan Malaysia (UKM). A survey form was designed using the service-product concept. Result from 102 respondents obtained from both descriptive and quadrant analysis helps us determine the most important aspects of the university's services and the degree to which they satisfied the students. It was found in our case that university reputation is the most important factor contributing towards student satisfaction with 0.98 correlation value while non-academic aspects have the least influence with 0.874. It is evident that this aspect should be improvised by university management to increase student satisfaction and maintain the sustainability of programmes.

Keywords: Student satisfaction, Service quality, Employability skills.

1. Introduction

Measuring the value-added variables that influence university students satisfaction is needed, as they come from different academic background [1].This process helps educational institutions recognize their internal strength and weakness, and external opportunities and threats of their programmes [2]. Currently, increasing demand for, and change in, the area of engineering study forces the field to confront the question on how well university programs are keeping up with these changes and whether graduate programmes are preparing students into working area.

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Nomenclatures

HEdPERF	Higher Education Performance
r	Strength of correlation
α	Confident of interval

Universiti Kebangsaan Malaysia is committed to be at the vanguard in leading the development of a learned, dynamic, and moral culture. Whereas the Faculty of Engineering and Built Environment (Fakulti Kejuruteraan dan Alam Bina, FKAB) vision and mission are 'To be a centre of excellence for the development of engineering and architecture knowledge at international level, leading the development of a civilisation' and 'Towards producing dynamic, creative and ethical engineers and architects', these are consistent with the student outcome expectation and the industrial needs.

In order to expand and improvise, measurements have been conducted via survey. Master by course Programmes Survey was developed to provide a new platform for measuring the quality of teaching and learning for Masters Programmes in FKAB, UKM. It provides basic inputs in developing educational plans, formulating educational policies, and monitoring the progress of various educational schemes proposed.

Student satisfaction in Masters by course programmes was identified in term of perception and expectation. Determination of the impact of courses undertaken towards student professional ethics in terms of employability skills, as well as the efficiency of teaching and learning process offered in UKM, were also assessed from the survey for quality improvement purposes. We believe that our findings and recommendation would apply to many engineering faculties that offer Masters by course Programmes nationwide.

Survey responses were contributed by students of five Masters by course programmes of Faculty of Engineering and Built Environment. Their insights provide an insider's vantage point for understanding trends in demand for university education. Factors such as non-academic aspects, academic aspects, assessment, programme issue and outcome, reputation, access, and employability skills are shaping this education programme.

Kaldenberg [3] found that in the college, student satisfaction is driven by evaluating the quality of coursework and other curriculum activities and other factors related to the university. Lecturers should treat students with sensitivity and sympathy, and assistance should be provided when necessary. Grossman [4] stated that students should be treated like a customer or a client within the college and in that case, the college serves the students on a better priority to fulfil their expectations and needs. Keeping customers satisfied leads to customer loyalty.

Several previous studies have shown that various service qualities in higher education lead to student satisfaction. Abdullah [5] pointed out the non-academic and academic aspects, programme issues, reputation and access are determinants of service quality in higher education. Bitner and Zeithaml [6] discussed that the communication skills of teaching staff, the effective interaction between staff and students can help students achieve study objectives, leading to higher student

satisfaction. Kara and DeShields [7] hypothesized that faculty performance, advising staff performance, and classes would influence students' academic experience and which in turn would influence the student satisfaction. Delaney [8] reported that academic staff, academic experience, residential life, social life on campus, personal development opportunities, and student services and resources were the service qualities that lead to student satisfaction.

2. Methodology

In this case, in order to gather data on 102 students' evaluations of their programmes, survey forms were distributed to various UKM master engineering programmes by coursework. The questionnaire that has been distributed manually was created based on 5-point Likert scale of SERVQUAL measuring instrument (Table 1). SERVQUAL questionnaire compares the perception of service received with expectation, in term of reliability, responsiveness, assurance and empathy [9]. Students were asked to mark in the interval scales to reflect their perception and expectation on the questionnaire. Perception refers to student attitudes towards actual performance delivered (perceived performance) and expectation refers to student's anticipation prior to enrolment.

Table 1. 5-point Likert scale of SERVQUAL measuring instrument.

Likert Scale	Perception	Expectation
1	Not Satisfactory at all	Not Important at all
2	Not Satisfactory	Not Important
3	Quite Satisfactory	Quite Important
4	Satisfactory	Important
5	Most satisfactory	Most Important

The service quality variables measured were adapted from Abdullah [5] who had developed HEdPERF (Higher Education Performance) model. Five variables that were proposed to be measured are 'Non-academic aspects', 'Academic aspects', 'Programme Issues', 'Reputation' and 'Access'. HEdPERF was found out to be the best measurement capability to measure higher education service quality as it had high correlation with the overall satisfaction [10]. Furthermore, a variable adapted from Afzal et al. [11], 'Design, delivery and assessment', was included to determine service quality.

Descriptive analysis by SPSS is a transformation of the raw data into an easy form of data interpretation [12]. Pearson Correlation Coefficient was used to measure relationship between perception and expectation within variables and to study relationship between service quality variables and overall student satisfaction. Since the analysis was measured with 99% level of confidence, the confidence interval, α would be 1% i.e. 0.01. However, data with 95% level of confidence is still accepted and considered significant. The strength of correlation coefficient is measured based on **r** value, and shown in Table 2.

Table 2. The strength of correlation coefficient.

Correlation (r)	Interpretation
1	Perfect positive liner association
0	No liner association
-1	Perfect negative association
0.90 ~ 0.99	Very High (very strong) positive correlation
0.70 ~ 0.89	High (strong) positive correlation
0.40 ~ 0.69	Medium (moderate) positive correlation
0.00 ~ 0.39	Low (weak) positive correlation
-0.39 ~ 0	Low (weak) negative correlation
-0.69 ~ -0.40	Medium (moderate) negative correlation
-0.89 ~ -0.70	High (strong) negative correlation
-0.99 ~ -0.90	Very High (very strong) negative correlation

3. Results and Discussion

Descriptive analysis revealed that the Civil Engineering programme (45.7%) had the most respondents, while Environmental Engineering programme was with the least respondents at 4.3%. Analysis by gender showed that 45.7% of total respondents were women and 84.4% of the respondents were aged from 16-34 years.

3.1. Student Satisfaction towards service quality for UKM taught Master Engineering Programmes.

The service quality variables measured in this case are 'Non-academic aspects', 'Academic aspects', 'Programme Issues', 'Reputation', and 'Access' and 'Design, delivery and assessment'. Each variable contains in the range of three to ten other sub-variables as shown in the survey form attached in *Appendix A*. This paper, however, will only report on the overall results of each main variable determining the service quality of our programmes. Table 3 shows the results from the Pearson Correlation Coefficient analysis.

Table 3 shows that students perception within each variables are highly correlated with their expectation (r = 0.944~1). These significant data (α <0.01) explained that education offered by our taught course engineering master programmes is consistent with student expectation prior to enrolment.

Comparison was also made between the satisfactions for each variable with the overall student's satisfaction as shown in Table 4. The overall student satisfaction variable determines if a student, based on their perceptions, would recommend UKM to others.

Table 4 shows that the chances of relationship among them are quite vary. The correlations achieved are highly positive of 0.874 to 0.980. Nevertheless, it was also found that for 'non-academic aspects' variable, the confidence interval, α

values obtained were larger than 0.05. The analysis indicates that this variable is not significantly contribute to the overall student satisfaction as student might think that these categories were not strong enough in university educational system and does not influence their satisfaction. Thus, major changes should be carried out on this aspect.

Table 3. Strength of correlation between perception and expectation, *r* and Confidence interval, for Student Satisfaction towards service quality for UKM Master by course Engineering Programmes.

Service Quality Variables	Correlation between perception and expectation within variables	
	Strength of correlation, *r*	Confidence interval, *a*
Non-academic aspects	0.976	0.004
Academic Aspects	1.000	0.000
Design, Delivery and Assessment	0.987	0.002
Programme Issues	0.987	0.004
Reputation	0.964	0.008
Access	0.971	0.006

Table 4 Strength of correlation, *r* and confidence interval, *α*, between overall student satisfaction and perceived satisfaction within variable in Section on Student Satisfaction towards service quality for UKM taught Master Engineering programmes.

Service Quality Variables	Correlation between overall student satisfaction and service quality variables.	
	Strength of correlation, *r*	Confidence interval, *α*
Non-academic aspects	0.874	0.053
Academic Aspects	0.943	0.016
Design, Delivery and Assessment	0.928	0.023
Programme Issues	0.956	0.011
Reputation	0.980	0.003
Access	0.914	0.030

The administrative staffs needed to be more sincere, friendly, accurate, punctual, positive, and have good knowledge regarding postgraduate programmes and their task. This is important for the student satisfaction in the 'non-academic aspects'. Efficient administrative has influence elements of the outputs, the outcomes and the environmental factors. The last one, which is the environmental factors (such as lifestyle and various socio-economic influences) make use of a major influence over the effectiveness [13].

3.2. Student Satisfaction towards additional value on employability skills, gained from UKM taught Masters Engineering Programmes.

The employability skills possessed by graduates from higher education institutions are skills, knowledge, attitudes and commercial understanding to enable them to make productive contributions to organizational objectives soon after commencing employment [14]. In this case, the skills gained were measured in terms of 'Communication skills', 'Teamwork', 'Lifelong learning', 'Professionalism', 'Problem solving and decision making skills', 'Competency', 'Knowledge of science and engineering principles', 'Knowledge of contemporary issues', 'Engineering system approach', 'Competence in specific engineering discipline' and 'Entrepreneurial skills'. Table 5 shows the correlation between the expectation and perception.

Results revealed that both correlate very well with confidence interval values, α of less than 0.05. Indicating that programmes offered by our university do provide additional value for employability skills, as expected from students prior to enrolment.

Table 5. Correlation between perception and expectation within variables in Section on Additional value on employability skills gained from UKM taught Master Engineering programmes.

Employability Skills Gained Variables	Correlation between perception and expectation within variables	
	Strength of correlation, *r*	Confidence interval, *a*
Communication skills	0.981	0.003
Teamwork	0.994	0.001
Lifelong learning	0.997	0.000
Professionalism	0.974	0.005
Problem solving and decision making skills	0.993	0.001
Competency	0.964	0.016
Knowledge of science and engineering principles	0.967	0.007
Knowledge of contemporary issues	0.980	0.003
Engineering system approach	0.993	0.001
Competence in specific engineering discipline	0.994	0.001
Entrepreneurial skills	0.960	0.010

The relatedness of the perceived skills was then compared with the overall student's satisfaction as shown in Table 6. It can be seen that 'reputation', 'teamwork' and 'entrepreneurial skills gave α-values of smaller than 0.01. This

tells us that students are satisfied the most with university image, entrepreneurial skills and ability to work in a group obtained from university as additional value on their employability skills. Hence, university should maintain these aspects in their educational system. For the other categories, even though the α-values are higher, they are still significantly related to overall student satisfaction, (α-values <0.05). This analysis explains that these factors do somehow influence student satisfaction.

Table 6. Correlation between overall student satisfaction and variables within variable in Section on Additional value on employability skills gained from our programmes.

Employability Skills Gained Variables	Correlation between overall student satisfaction and additional value on employability skills gained variables.	
	Strength of correlation, r	Confidence interval, α
Communication skills	0.941	0.017
Teamwork	0.963	0.008
Lifelong learning	0.928	0.023
Professionalism	0.928	0.023
Problem solving and decision making skills	0.902	0.037
Competency	0.828	0.083
Knowledge of science and engineering principles	0.843	0.073
Knowledge of contemporary issues	0.888	0.044
Engineering system approach	0.887	0.045
Competence in specific engineering discipline	0.848	0.069
Entrepreneurial skills	0.967	0.007

Nevertheless, for 'competency', 'knowledge of science and engineering principles', and 'competent in specific engineering discipline' variables, the α-values were bigger than 0.05. The analysis indicates that these variables do not significantly contribute to overall student satisfaction. Thus, major changes should be carried out on these aspects for improvement.

The University needs to acknowledge necessary techniques and skills for modern engineering practices[1] while taking quality standards and specification

[1] Engineering practice means planning, designing, composing, evaluating, advising, reporting, directing or supervising that requires the application of engineering principles and that concerns the safeguarding of life, health, property, economic interests, the public welfare or the environment, or the managing of any such act.

aspects into account. All industrial sectors require their engineering workforce must be equipped with knowledge of engineering fundamentals [15].

The ability to acquire in-depth technical competence in a specific engineering discipline is required by employers. Engineering employability skills, otherwise known as generic skills, are highly related to non-technical skills and play a crucial role for a graduate in getting employed and suitably comfortable in the workplace [16].

4. Conclusions

Student perception of service quality for UKM Taught Master Engineering Programme did met their expectation prior to enrolment with correlation value 0.944~1 and significant (α <0.01). In teaching and learning programme proposed by UKM, university reputation (r = 0.980, α = 0.003) is the most important factor that contributes towards student satisfaction on university education while non-academic (r = 0.847, α = 0.053) aspect has the least influence. The courses undertaken generally gave a good impact towards student professional ethics of employability skills especially in term of teamwork (r = 0.963, α = 0.008) and entrepreneurial skills (r = 0.96, α = 0.007) aspects. However, some modifications mentioned in the discussion should be made to improve student's competency in engineering practice (r = 0.828, α = 0.083), knowledge of science and engineering principles (r = 0.843, α = 0.073) and competency in specific engineering disciplines (r = 0.848, α = 0.069).

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Appendix A

Questionnaire design

The questionnaire was designed with the service quality variables measured in this case: 'Non-academic aspects', 'Academic aspects', 'Programme Issues', 'Reputation', 'Access' and 'Design, delivery and assessment'. Each variable contains in the range of three to ten other sub-variables. An example of the questionnaire is below:

B2. Academic aspects	1 2 3 4 5	1 2 3 4 5
B4. Programme Issues	1 2 3 4 5	1 2 3 4 5
1. The university runs excellent quality programs.	☐☐☐☐☐	☐☐☐☐☐
2. The university offers a wide range of program with various specializations.	☐☐☐☐☐	☐☐☐☐☐
3. The university operates an excellent counseling service.	☐☐☐☐☐	☐☐☐☐☐
4. The university offers programs with flexible structure.	☐☐☐☐☐	☐☐☐☐☐
B5. Reputation	1 2 3 4 5	1 2 3 4 5
1. The university has a professional image.	☐☐☐☐☐	☐☐☐☐☐
2. The academic program run by the university is reputable.	☐☐☐☐☐	☐☐☐☐☐
3. The university's graduates are easily employable.	☐☐☐☐☐	☐☐☐☐☐
B5. Access	1 2 3 4 5	1 2 3 4 5
1. Academic staffs are never too busy to respond my request For assistance.	☐☐☐☐☐	☐☐☐☐☐
2. Academics staffs allocate sufficient time for consultation.	☐☐☐☐☐	☐☐☐☐☐
3. The staffs ensure that they are easily contacted.	☐☐☐☐☐	☐☐☐☐☐

	PERCEPTION	EXPECTATION
B1. Non-academic aspects	1 2 3 4 5	1 2 3 4 5
1. When I have problem, administrative staffs show a sincere interest in solving it.	☐☐☐☐☐	☐☐☐☐☐
2. Administrative staffs provide caring attention.	☐☐☐☐☐	☐☐☐☐☐
3. Inquiries are dealt with efficiently.	☐☐☐☐☐	☐☐☐☐☐
4. Administration offices keep accurate and retrievable records.	☐☐☐☐☐	☐☐☐☐☐
5. When the staffs promise to do something by a certain time, they do so.	☐☐☐☐☐	☐☐☐☐☐
6. Administrative staffs show positive work attitude towards students.	☐☐☐☐☐	☐☐☐☐☐
7. Administrative staffs communicate well with students.	☐☐☐☐☐	☐☐☐☐☐
8. Administrative staffs have good knowledge of the systems.	☐☐☐☐☐	☐☐☐☐☐
9. Students are treated equally by the staffs.	☐☐☐☐☐	☐☐☐☐☐
10. The staffs respect the terms of confidentiality when I disclose information to them	☐☐☐☐☐	☐☐☐☐☐