The Impact of Service Quality and Student Satisfaction at the Faculty of Engineering Andalas University

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Abstract. The purpose of this study is to address how quality of service influences higher education quality of graduates and the role that student satisfaction and service quality play in this relationship. A quantitative methodology approach was developed. A questionnaire was developed and deployed as a survey for group of students on Engineering Faculty, Universitas Andalas. A total of 461 responses were received using convenience sampling technique and were analyzed. Findings revealed that service quality model could help the faculty of engineering for making improvement in all of aspects of higher education service. From the gap analysis, the faculty of engineering can get information in which areas should be improved in order to increase service quality. There is a positive correlation between dimension of service quality and student satisfaction

Keywords: Service Quality, Student Satisfaction, Higher Education.

1. Introduction

Higher education has important role in achieving economic development and has allocated fiscal, physical, and human resources and created entrepreneurship systems within the institutions to advance economic development. This role will not only increase the changes in technology, globalization, and demographics a country but also has the capacity, knowledge, and research necessary to improve productivity and adopt an innovative spirit. The higher education will be a dominant factor in preparing workers with the robust skills needed to adapt to changing job requirements. The quality of workers is prepared by higher education through instructional programs, matching instruction to the needs of business and industry, and helping individuals learn throughout their lives. Higher education is also expected to develop a learning community where student can develop holistic competencies for a global society [1].

Throughout instructional programs, higher education offers quality programs and services and continually improves these programs to ensure teaching and learning excellence. The teaching excellence is the key a strong and growing regional economy [2]. Students are primary stakeholders for higher education institution by assessing service quality from their viewpoint, it is crucial for making improvement on teaching and learning programs [3].

Based on the consumer behaviour of theory in education, students can be regarded as primary costumers who receive the educational services [4]. Students purchase the services provided by education: therefore, the students have the right to obtain the best quality of education. To improve the quality services, the higher education must understand their needs. To understand their needs, the quality attributes embraced by customers must be understand.

To define service quality in higher education, it is important to clarify both the 'service' and the 'quality' construct. A service in higher education is focus to provide quality learning experiences to students as its costumers through effective learning process [5]. A service has no physical form and it is produced and consumed at the same time. Parasumaran et al. [6] divide into three characteristics of services: intangibility, heterogeneity, and inseparability. In the higher of education, quality is difficult to define of quality because it is depend on every stakeholder [7]. For example, quality in the student perspective is determined by the expectations of individual student [8]. The definition of quality of service in higher education is the difference between what a student expects to receive and his/her perceptions of the actual delivery [9]. Parasumaran et al. [6] define quality of service as the gap between expectations and perceptions of service receiver.

The dimensions of quality of service were proposed by Parasumanan et al.[6] and they were well known as the five dimension of SERVQUAL scale of contemporary quality of service. The five dimensions of SERVQUAL are reliability, assurance, tangibles, empathy and responsiveness, for measurement of quality of service (as shown in Table 1). The measurement of quality of service in the higher of education relates to the dimension of service quality - the SERVQUAL model. The SERVQUAL model is known as the gap model which is identified the gap between customer expectations and customer perceptions.

SERVICE QUALITY = PERCEPTIONS - EXSPECTASIONS[10]

Table 1. The five dimension of Service quality

No.	Dimensions	Remarks
1	Reliability	Capability to provide the promised service accurately and dependably.
2	Assurance	Courtesy and knowledge of personnel and ability to convey confidence and trust
3	Tangibles	Physical facilities, equipment, appearance, of personal etc.
4	Empathy	Attention provided to individual customer.
5	Responsiveness	Willingness to provide prompt service and help customer.

The SERVQUAL model has been used by many researchers [1,10,11] for assessing quality of service in higher education focusing on the role of students as primary customers by measuring the gap between their expectations and perceptions. The negative gap in the five dimension of SERVQUAL model can be used not only to improve educational service quality [10] but also to provide relevant information in which areas improvement is necessary in order to enhance service quality[11].

The extent to which an institutions service performance meets the reckoning of the students is known as student satisfaction [12]. Satisfaction of students is affected by students' expectations and their perception about services and quality of services provided [13]. Gathering student opinions about all aspect of academic life is a way to determine student satisfaction. The measurement of satisfaction deal with measuring what students feel about a service that is received and consumed. Feelings can be expressed about the ability of university to meet student's expectations of university and the university experience as a whole.

2. Methods

This research is a cross-sectional study where primary data were obtained using quantitative approach from undergraduate students of Engineering Faculty, Andalas University. To save expenses and times, a convenience sampling technique was used. Service quality showed an enhancing impact on student satisfaction [6]. This study was measuring the effect of service quality on student satisfaction by using internal quality assurance assessment results. The research hypotheses for this research are as follows:

H1 : There is a negative gap between student expectations and perceptions
H2 : SERVQUAL Model can be used to determine in which area improvements should be made by institution.
H3 : SERVQUAL dimensions have a positive influence on student satisfaction.

Likert-type scales were used for items measuring service quality and student satisfaction with response categories from 1 = strongly disagree to 7 = strongly agree. Whereas, likert-type scales were used for items measuring Internal Quality Assurance Assessment with response categories from 1 = strongly disagree to 7 = strongly agree. The research was conducted at Faculty of Engineering Andalas University. The total number of students enrolled in academic year 2018/2019 was 3069. A sampling rate of 10% was set and the total number of students in the sample was N= 461.

The essential pillar of the the research process is to guaranty that the instruments are reliability. Reliability of experiment is achieved when an experiment gives the same results repeatedly [14]. According to Murphy and Balzer [15], the value of Cornbach's coefficient of above 0.7 is considered suitable and reliable.

Table 2. Reliability analysis

No.	Dimension	No. of items	Cronbach Alpha (α)
1.	Service Quality Perceptions	25	0.937
2.	Service Quality Expectations	25	0.962
3.	Student Satisfaction	24	0.942

3. Results and Discussion

Demographic profiles and Frequency

The number of students in the population, frequency, and per sent of each of demographic features are shown in Table 3.

Table 3. Demographics of Survey Respondent

Demographic features	Number of students in the population	Frequency	Persent
Study Programs:			
1. Mechanical Engineering	695	104	22.56%
2. Civil Engineering	857	129	27.98%
3. Industrial Engineering	527	79	17.14%
4. Electrical Engineering	579	87	18.87%
5. Environmental Engineering	411	62	13.45%
Total	3069	461	100.00%

Gender:			
1. Male	1996	299	64.86%
2. Female	1073	162	35.14%
Total	3069	461	100.00%
Level of Study:			
1. 1st year of study	799	119	25.81%
2. 2nd year of study	779	116	25.16%
3. 3rd year of study	766	114	24.73%
4. 4th year of study	752	112	24.30%
Total	3069	461	100.00%

This research was conducted using a structured questionnaire with 25 questions for each scale: one to measure student's expectations and one to measure student's perceptions. The SERVQUAL model has five dimension, namely: reliability, assurance, tangibles, empathy, and responsiveness. All of the five dimensions were covered with 25 questions, and the structure of the questionnaire is shown in Table 4.

Table 4. Dimensions and questions in the questionnaire

No.	Dimensions	Questions
1.	Reliability	1 - 4
2.	Assurance	5 - 10
3.	Tangibles	11 - 13
4.	Empathy	14 - 19
5.	Responsiveness	20 - 25

Table 5. Comparison of students' expectations and perceptions

Dimension	Mean	SD	Min - Max	95% CI
Electrical Engineering				
Perception	5.161	0.803	3.16 - 6.56	4.989 - 5.332
Expectation	5.135	0.857	3.08 - 7.00	4.953 - 5.318
Student Satisfaction	5.107	0.631	3.75 - 6.96	4.972 - 5.241
Gap	0.0257	1.214	-2.96 - 3.16	-0.233 - 0.284
Industrial Engineering				
Perception	5.148	0.682	4.08 - 6.92	4.996 - 5.301
Expectation	5.952	0.842	4.28 - 7.00	5.763 - 6.141
Student Satisfaction	5.108	0.558	3.21 - 6.67	4.983 - 5.233
Gap	-0.803	0.876	-2.60 - 1.24	-0.999- -0.607
Environmental Engineering				
Perception	5.072	0.851	3.88 - 7.00	4.856 - 5.288
Expectation	5.289	0.717	4.00 - 7.00	5.107 - 5.471
Student Satisfaction	4.936	0.650	4.00 - 7.00	4.771 - 5.101
Gap	-0.217	0.898	-2.04 -1.72	-0.445 - 0.011
Mechanical Engineering				
Perception	5.111	0.851	3.04 - 7.00	4.946 - 5.277
Expectation	5.388	0.839	3.16 - 7.00	5.224 - 5.551
Student Satisfaction	5.150	0.696	3.54 - 7.00	5.015 - 5.285
Gap	-0.276	1.024	-3.48 - 3.48	-0.476- -0.077

Civil Engineering				
Perception	5.195	0.832	3.28 - 7.00	5.049 - 5.341
Expectation	5.394	0.828	3.44 - 7.00	5.249 - 5.539
Student Satisfaction	5.133	0.668	3.75 - 7.00	5.016 - 5.250
Gap	-0.199	0.894	-3.16 - 2.12	-0.355- -0.043
Engineering Faculty				
Perception	5.145	0.808	3.04 - 7.00	5.071 - 5.219
Expectation	5.425	0.861	3.08 - 7.00	5.346 - 5.504
Student Satisfaction	5.101	0.648	3.21 - 7.00	5.042 - 5.161
Gap	-0.280	1.018	-3.48 - 3.84	-0.374- -0.187

The gap between expectations and perceptions of the provided service from the students' point of view is shown on Table 5. In the table, the comparison of student's expectations and perceptions is presented. In Table 5, the overall averages of the five dimensions for expectation are higher than those of perception. The total gap is - 0.280 for faculty of engineering. The electrical engineering has positive gap, it means that the study program has given good service to student. The lowest gap is -0.199 for civil engineering and the highest gap is -0.803 for industrial engineering. The negative gap indicates that a quality improvement program needs to be developed by study program. In the table 5, student satisfaction also is presented. The highest student satisfaction among faculty of engineering is 5.133 for civil engineering and the lowest is 4.936 for environmental engineering.

Table 6. Gap between student's expectations and perceptions for all of five dimensions

Dimension	Reliability		Assurance		Tangibles		Empathy		Responsiveness	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Elect. Eng.										
Perception	5.141	0.896	5.011	0.966	5.114	0.923	5.268	0.838	5.241	0.839
Expectation	5.264	1.080	5.016	0.972	4.901	0.966	5.178	0.920	5.243	0.889
Gap	-0.124	1.393	-0.004	1.401	0.211	1.376	0.090	1.217	-0.002	1.220
Ind. Eng.										
Perception	4.899	0.738	4.909	0.736	5.029	0.766	5.503	0.798	5.297	0.771
Expectation	5.858	0.888	5.785	0.885	5.882	1.007	6.128	0.906	6.041	0.886
Gap	-0.959	0.990	-0.876	0.996	-0.852	1.016	-0.627	0.929	-0.781	0.935
Env. Eng.										
Perception	5.173	0.982	4.941	0.950	4.962	0.918	5.120	0.839	5.142	0.948
Expectation	5.314	0.867	5.233	0.715	5.145	0.868	5.290	0.795	5.398	1.029
Gap	-0.141	1.03	-0.293	1.110	-0.183	1.095	-0.169	0.860	-0.256	1.211
Mech. Eng.										
Perception	5.231	1.121	4.989	0.940	5.000	0.939	5.205	0.883	5.115	0.926
Expectation	5.546	0.936	5.252	1.029	5.267	0.944	5.508	0.868	5.359	0.865
Gap	-0.315	1.193	-0.262	1.270	-0.266	1.124	-0.303	1.020	-0.244	1.081

Civil Eng.										
Perception	5.203	0.920	5.151	1.148	5.062	0.945	5.297	0.864	5.198	0.899
Expectation	5.508	0.906	5.403	1.361	5.229	0.997	5.490	0.832	5.375	0.907
Gap	-0.305	1.055	-0.173	1.352	-0.166	1.122	-0.193	0.827	-0.178	0.910
Fac. Eng.										
Perception	5.141	0.923	5.018	0.979	5.038	0.905	5.282	0.853	5.191	0.878
Expectation	5.504	0.956	5.338	1.089	5.276	1.007	5.518	0.914	5.464	0.944
Gap	-0.363	1.183	-0.298	1.283	-0.238	1.194	-0.236	0.997	-0.273	1.084

The negative gap in all of five dimensions is shown in Table 6. The meaning of negative gap is that faculty of engineering does not provide good service to student. From Table 6, the lowest gapsare empathy (-0.236) and the highest gapsare reliability (-0.363). The most negative gaps of the five dimension are reliability and assurance which are related to the quality of the academic staff, their knowledge, and competences to perform reliable education service. The next lowest negative gap is responsiveness which is generally related to staff's sensitivity towards student, providing prompt services, and responding to students' needs. The least negative gap is empathy and tangibles. Empathy is related to the conduct of faculty and staff towards to student. The faculty and staff should give attention, help, and support to students. Tangibles is related to imply modernization of infrastructure and utilization information and communication technology.

Among study programs in the faculty of engineering (Table 6), Industrial engineering has the most negative gaps in all of five dimensions. It means that this study program needs to be developed a quality improvement program.

Table 7 and 8 shows that correlation between service quality, service quality dimensions, and student satisfaction. The value of r could be negative or positive. The negative correlation implies that relation between service quality dimensions and student satisfaction is negatively linear, whereas positive correlation is that relation between service quality dimensions and student satisfaction is positively linear. According to Colton [16], the strength of correlation (r) between two variables is qualitatively divided into:

$r = 0.00 - 0.25$ no correlation or weak correlation

$r = 0.26 - 0.50$ mild correlation

$r = 0.51 - 0.75$ strong correlation

$r = 0.76 - 1.00$ very strong correlation

From Table 7 overall, perceptions and expectations are positively linear which if service quality dimensions increase, student satisfaction can be increased. Because of $p > 0.01$, the correlation between service quality and student satisfaction is significant. The strength of the correlation of perceptions and expectations is weak. From the Table 8, it shows that the correlation above 0,2 is dimensions of tangibles and empathy.

Table 7. Correlation between service quality and student satisfaction

Service Quality	r	p
Perceptions	0.203	0.000
Expectations	0.172	0.000

Table 8. Correlation between five dimensions of service quality and student satisfaction

Dimension	r	p
Perceptions		
Reliability	0.187	0.000
Assurance	0.131	0.005
Tangibles	0.207	0.000
Empathy	0.219	0.000
Responsiveness	0.181	0.000
Expectations		
Reliability	0.137	0.003
Assurance	0.179	0.000
Tangibles	0.175	0.000
Empathy	0.166	0.000
Responsiveness	0.156	0.001

4. Conclusion

The SERVQUAL model was used for assessing service quality at the Faculty of Engineering, Andalas University and the existence of a negative gap between students' expectations and perceptions was determined. In conclusion, based on the results of the research it can be concluded that the research hypotheses is positively confirmed. A negative gap between students' expectations and perceptions of the service quality was identified based on the research results. This negative gap can be analyzed and used to identify in which areas service quality at the Faculty of Engineering needs to be improved. The most negative gaps are reliability that it means that the faculty of engineering should increase the quality of the academic staff, their knowledge, and competences to perform reliable education service.

There is the impact of service quality to student satisfaction in the Faculty of Engineering. Student satisfaction will be increased linearly if quality service quality is increased. The correlation between service quality and student satisfaction is significant but the correlation is weak.

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