

Students' Satisfaction Towards Chemical Engineering Study Program in Private Universities in Palembang

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Abstract

In supporting the national economy and competitiveness, Indonesia is trying its best to enhance the role of chemical industry. Chemical engineering graduates are expected to take responsibility as problem solver in promoting Indonesia through knowledge gained by being the best in their field. In order to achieve that, the quality of human resources must first be enhanced, in part, through the quality of education. Service quality and student satisfaction plays a significant role in measuring the performance of a product and service as well as the university itself. Sustainability of universities cannot be separated from the role of its study programs and the presence of their students. Therefore, universities must be able to anticipate the competitiveness, explore, and improve all aspects of service to gain the students' satisfaction. The purpose of this study is to measure and compare the students' satisfaction on service quality of chemical engineering study program specifically among three private universities in Palembang, Indonesia. Questionnaire was developed based on the universities' services such as academic and administration as well as the facilities and equipment adequacy. The data were then statistically analyzed by performing descriptive statistics, regression and independent sample t-test. A total of 130 students from three private universities participating in this study. The findings indicated that overall, chemical engineering students are quite satisfied. University X gain the most likely satisfying among the three universities, followed by University Y, and University Z. The highest contribution in terms of aspect to total students' satisfaction is 62.7% in facilities and infrastructure while the lowest is in management. From the independent sample t-test, students' satisfaction total is significantly different. In terms of aspect, the significant difference between University X and Y is in facilities and infrastructure, between University X and Z is in management, and between University Y and Z is in funding.

Keywords: students, satisfaction, service, quality

Introduction

The progress of a nation is dependent on the mastery of science and technology. Advances in science and technology are often regarded as the source of the most important and decisive in the process of development and economic growth. The development of the market, science and technology has led to an increase in demand for education and professional quality experience that are generally acquired in private higher education institutions (Poturak, 2014). Discoveries of new technologies such as the multidisciplinary fields of chemical engineering, industrial engineering, and informatics engineering, are expected to increase productivity so that the nation's competitiveness can be improved. In order to improve the competitiveness of a nation, the quality of human resources must firstly be enhanced, one of which is through the quality of education.

Most institutions and study programs in Indonesia are still accredited rated C. Based on the Higher Education Database (PDPT) as of October, 2015, there are 4,306 higher education institutions which consist of 5 community college, 1,086 colleges, 228 polytechniques, 2,340 higher institution, 134 institutes and 513 universities. The number of study programs recorded more than 20,373 study programs. There are 18,848 study programs and 852 higher education institutions have been accredited by National Accreditation Body for Higher Education Institution (BAN - PT), but only 10% were rated A and almost 50% were rated C, including chemical engineering study programs in private universities in Palembang. For the achievement of accreditation rated A and B are mostly dominated by public higher education institution.

The competition among Higher Education Institutions in Indonesia is very high. In addition, the status of some state universities becoming a state-owned legal entity made many state universities open non regular classes outside the regular selection of new admissions. The status change is in fact made a large number of private universities students enter non regular classes owned by state universities in recent years. In the end, many private universities with short of students are in danger of collapse.

Higher education is facing pressure to improve value in its activities (Heck and Johnsrud, 2000). The purpose of higher education is to educate people to be qualified human resources for developing societies as well as a nation. Sustainability of higher education institution cannot be separated from the role and the presence of their customers. Customer service and quality are driving forces in the business community.

Higher education institutions, state or private, that want to gain competitive advantage have to take students' satisfaction as the main source of competitive advantage. If they succeed to satisfy their customers who are the students, this satisfaction will bring students' retention, new students will be also attracted and positive word of mouth about institution will be spread as well (Arambewela and Hall, 2009).

According to Teo (2001), private universities do not have the privilege to receive any subsidies or financial assistances from the government and have to depend on the interaction and mechanism of the market. Therefore, they must be able to anticipate the competitiveness and explore as well as improve all aspects of service owned. In this globalization era, local universities are facing new challenges in the educational arena. The change is quite rapid and it forced them to develop aligned strategies and policies so that they will continue to grow, if not, sooner or later they will suffer a setback.

Literature Review

The Role of Higher Education in Indonesia

Indonesia is a country that is endowed with abundant of natural resources. Unfortunately, Indonesia does not have enough capable human resources to manage the natural resources that have the potential to bring prosperity of the nation. Therefore, the opportunity to participate in higher education and the number of students should be improved continuously and evenly in order to produce graduates in sufficient numbers to encourage economic growth and competitiveness.

The level of competition of human resources at the national and international job market continues to rise with the increase in the utilization of new technologies in various fields of business, as well as the needs of an increasingly high level of professionalism which includes knowledge, hard skills and soft skills. Efforts to improve the quality of university graduates in Indonesia is different from the past. Open markets have led to the penetration of labor from abroad even greater, so the competition is no longer among graduates nationwide but also among graduates from foreign universities.

The strict competition of seeking work among university graduates in Indonesia demands that higher education providers constantly make adjustments to the curriculum, process, and learning materials to the development of the working world. Increased relevance of education should be subjected to continuous quality improvement as part of a quality assurance system of higher education as a whole.

The importance of human resource development has also been recognized by the government as manifested in its Second Long-Term Development Plan (1994-2019) (Lembaga Pertahanan Nasional, 1989). The plan clearly states that Indonesia's long-term objective is to improve the quality of Indonesian people. With respect to education, the country's Guideline of State Policy indicates that education should also be able to foster and strengthen the spirit of nationalism and sense of solidarity.

Every nation has its own system of education which is in line with its ideal and needs. In Indonesia, higher education institutions must be able to fulfill the criteria of National Education Standards as mentioned in Government Regulation No.19 Year 2005 (Peraturan Pemerintah No.19 Tahun 2005) and Minister of Research, Technology and Higher Education Regulation No.44 Year 2015 (Permenristekdikti No.44 Tahun 2015) on National Education Standards which include: (1) graduate competency standard, (2) content standard, (3) process standard, (4) educational assessment standard, (5) educators and education personnel standard, (6) facilities and infrastructure standard, (7) management standard, and (8) funding standard.

The Quality Assurance Director of Directorate General of Learning and Student Affairs, The Ministry of Research, Technology and Higher Education said that quality assurance starts from the internal quality assurance system in order to meet minimum national standards (Kompas, 2015). In practice, there are still many who do not understand about the accreditation, placing it in the dichotomy between public and private universities. Consequently, it will create discrimination, unfair treatment, and closed access to jobs. Requirements for applying for a job with the accreditation values often differ between public and private university where as private universities are demanded higher.

Service Quality and Students Satisfaction

The need to remain competitive, productive, and open to challenges of the future in the face of organizational change is becoming more important than ever (Kaplan and Norton, 1996). Outstanding service quality as perceived by the customer, can give any organization a competitive advantage (Albrecht, 1991). The most important purpose in education sector is to support students learning and knowledge gaining, by providing quality service which will lead to student's satisfaction with service (Poturak, 2014). Service sector is gaining

importance like the manufacturing sectors due to globalization and increased competitive environment among the local and global companies (Petruzzellis et al. (2006) in Ijaz et al (2011)).

Johns (1999) in Daniel and Berinyuy (2010) defined services as 'intangible' and viewed their output as an activity rather than a tangible object which is not clear because some service outputs have some substantial tangible components like physical facilities, equipment and personnel. Service quality of higher education institution is basically defined considering students' overall assessment on the services they received that is actually element of their learning experience (Asaduzzaman, 2013).

Cronin and Taylor (1992) have examined a performance-based measure of service quality called SERVPERF which excludes any consideration of expectations. It is found that this measure explained more of the variance in an overall measure of service quality than did SERVQUAL. In addition, in Kilbourne et al, (2004) studies, it was mentioned that perception-only measures of service quality appear to have higher convergent and predictive validity.

According to Kotler and Keller (2012), satisfaction is the stage when someone feels to be delight or disappointed than the product or service provided to the customer. To delight the customer, the service provider must provide value added characteristic in order to gain and capture the customers, which are the students. Therefore, focusing on student satisfaction enable universities to develop a system for continuously monitoring how effectively they meet the students needs (O'Neill, 2003). As part of service industry, universities can gain competitive advantage through students' satisfaction (Kevin and Dooyoung, 2002). Moreover, satisfied customers serve as important source of free advertising through recommendations (Vinagre and Neves, 2008) and has a great impact on corporate image (Rashid and Jusoff, 2009).

Parasuraman, Zeithaml, and Berry (1990) indicated that poor performance among service related businesses often resulted from inadequate information about their own customers. If organizations do not know what their own customers want in term of service, then they cannot possibly design programs that match customer expectations of what constitute good services. Just like any form of business, factors related to satisfaction levels and students' perceptions of quality will attract and retain students (Petruzzellis et al (2006); Abu Hasan et al (2008); Arambewela and Hall (2009). Therefore, higher education institution must identify attributes that are important to their students constantly to obtain a competitive advantage position.

Methodology

This study involved the development of a survey that was adapted from what was available in the current literature and Indonesia's National Education Standards. The questionnaire was developed based on the universities' services such as academic and administration as well as the facilities and equipment adequacy. The questionnaire form consisted of 43 attributes classified into seven aspects which are: content (5 items), process (8 items), funding (2 items), educator and education personnel (6 items), facilities and infrastructure (12 items), management (7 items) and educational assessment (4 items). The responses were measured on a five point Likert scale whereas 5 represented very satisfied and 1 represented very unsatisfied. The population in this study comprises all of chemical engineering students in three private universities in Palembang, Indonesia. A sample of 150 students was chosen on a stratified random sampling. The data were then analyzed to measure the students' satisfaction using descriptive analysis, regression to obtain the contribution of aspect to total students' satisfaction and the comparison among the private universities using independent sample t-test in SPSS 17.0.

Results

The reliability of the scale was tested using Cronbach Alpha which provides a value of 0.806 which is more than the acceptable value of 0.70 (Ghozali, 2013). The demographics of the study are presented in Table 1 based on gender, university, and study level (year). Male students were 66% of total sample whereas female students were 34%. The students were chemical engineering students from three different private universities: University X and University Y each representing 38.5% of the total sample and University Z representing 23% of the total sample. The highest numbers of respondents were 26% third year student, 23% each of first and second year student, 15% fourth year student and 13% fifth year student.

	University X	University Y	University Z	Total	Percentage
Gender					
Male	28	35	23	86	66%
Female	22	15	7	44	34%
Year of study					
First	11	9	10	30	23%
Second	12	11	7	30	23%
Third	10	16	8	34	26%
Fourth	8	9	2	19	15%
Fifth	9	5	3	17	13%

Table 1- Selected demographic data of survey respondents

Table 2 shows the total mean of students' satisfaction for three universities is 24.4806. If divided into seven aspects, then the mean for each aspect is 3.49 which is in a moderate level of satisfaction from a scale of 5. University X has the highest total mean of students' satisfaction which is 25.5380. University Y and University Z total mean of students' satisfaction are 24.1189 and 23.3213 respectively.

University	N	Mean	Standard deviation
University X	50	25.5380	1.02340
University Y	50	24.1189	1.12895
University Z	30	23.3213	1.69215
Total	130	24.4806	1.52391

Table 2 Descriptive statistics for total students' satisfaction

The descriptive statistics for each aspect of students' satisfaction can be seen in Table 3.
Content: The first aspect represents the study program's curriculum, syllabus, manual, and courses that meet industry demand.

Process: The second aspect represents teaching and learning process provided by the university and study program to add value to the students during their studies.

Funding: This third aspect represents how suitable the price to the quality offered is and the ease of payment.

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Educator and Education Personnel: The fourth aspect represents qualifications and competence of lecturers and academic staff to provide education in order to meet the learning outcomes of students.

Facilities and Infrastructures: The fifth aspect represents the infrastructure, facilities, and physical structure of the study program and the university. This aspect includes building, classroom, library, mosque, sport facilities, computer facilities, English facilities, laboratory, and cafeteria.

Management: This aspect includes planning, executing, controlling, monitoring and evaluating, also reporting of learning activities at study program level.

Educational Assessment: The last aspect represents assessment process and learning outcomes of students.

For University X and University Z, the highest mean of students' satisfaction is in the process aspect, while students from both universities feel that from the management aspect, the alumni association is less active and the selection of new student admission is not so strict. Moreover, facilities such as laboratory, teaching media, and library in University Z need to be enhanced.

For University Y, the funding aspect has the highest mean of students' satisfaction whereas the quality offered is suitable to low tuition fee. However, for facilities and infrastructure such as adequate parking space, mosque, sports and art facilities need to be improved.

Aspects	University X			University Y			University Z		
	N	Mean	Std. dev	N	Mean	Std. dev	N	Mean	Std. Dev
Content	50	3.69	0.610	50	3.61	0.557	30	3.48	0.552
Process	50	3.72	0.646	50	3.51	0.609	30	3.54	0.671
Funding	50	3.58	0.512	50	3.91	0.668	30	3.43	0.533
Educator & Education Personnel	50	3.62	0.602	50	3.23	0.590	30	3.42	0.616
Facilities & Infrastructures	50	3.71	0.661	50	3.22	0.646	30	3.15	0.778
Management	50	3.46	0.590	50	3.26	0.644	30	2.94	0.716
Educational Assessment	50	3.70	0.695	50	3.34	0.647	30	3.25	0.651

Table 3 Descriptive statistics for each aspect of students' satisfaction

The contribution of each aspect to students' satisfaction total is presented in Table 4. The p-value of all aspects is 0.000 indicating a significant contribution to students' satisfaction total. The highest contribution is facilities and infrastructure which is 62.7%. This shows that the students value this aspect the most and it has the greatest impact towards students' satisfaction total. However, management is the weakest contribution among the seven aspects which is only 2%.

Aspect	R	R Square	Adjusted R Square	R Square Change	Sig. F Change	%
Facilities and Infrastructures	.792 ^a	.627	.624	.627	.000	62.7%
Funding	.868 ^b	.754	.750	.127	.000	12.7%
Educational Assessment	.921 ^c	.849	.846	.095	.000	9.5%
Process	.961 ^d	.924	.921	.075	.000	7.5%
Content	.976 ^e	.953	.952	.030	.000	3%
Educator and Education Personnel	.990 ^f	.980	.979	.027	.000	2.7%
Management	1.000 ^g	1.000	1.000	.020	.000	2%
		6.087	6.072	1.001		100%

Table 4 Contribution of each aspect to total students' satisfaction

Table 5 reports the comparison of means between University X and University Y, between University X and University Z, and between University Y and University Z respectively on each aspect of students' satisfaction.

Between University X and University Y, out of the seven aspects, only content is not significantly different whereas the significant score is 0.086 ($p > 0.05$). The highest mean difference is facilities and infrastructure which is 0.490.

In terms of all aspects, it is found that students' satisfaction between University X and University Z is significantly different whereas $p < 0.05$. The highest mean difference is in management which is 0.542.

Most of the aspects of students' satisfaction are not significantly different ($p > 0.05$) between University Y and University Z. These aspects are content, process, facilities and infrastructure and educational assessment. However, funding, educator and education personnel are significantly different. The highest mean difference is 0.476 which is in funding.

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Aspects	University X and University Y		University X and University Z		University Y and University Z	
	Sig. (2- tailed)	Mean Differences	Sig. (2- tailed)	Mean Differences	Sig. (2- tailed)	Mean Differences
Content	.086	.080	.005	.216	.068	.136
Process	.001	.200	.048	.171	.761	-.028
Funding	.002	-.310	.046	.166	.000	.476
Educator and Education Personnel	.000	.386	.003	.201	.012	.185
Facilities and Infrastructure	.000	.490	.000	.468	.669	.021
Management	.000	.217	.000	.542	.000	.325
Educational Assessment	.000	.355	.000	.450	.287	.095

Table 5 Independent sample t-test on students' satisfaction among private universities

Discussion

The quality of services provided by chemical engineering study programs in private universities in Palembang has been measured based on students' satisfaction. The average for overall satisfaction of aspects is 3.49 which is 70% of the total score. This indicates that chemical engineering study programs need to work hard to cover up the 30% to satisfy the students.

Facilities and infrastructure aspect contributed the most of students' satisfaction. University X is providing better quality of facilities and infrastructure compared to University Y and University Z, especially in laboratory facilities. Adequate in laboratory facilities are very important and crucial to chemical engineering study program since there are quite a lot of practical work to support the process of teaching and learning.

Among the three private universities, University Y has the highest score in term of funding aspect. This indicates that students are satisfied with the low tuition fee in accordance to quality of services. This also support in Teo (2001) studies that private universities do not have the privilege to receive any subsidies or financial assistances from the government and have to depend on the interaction and mechanism of the market.

Service quality leads to customer satisfaction, where as high service quality will increase customer satisfaction (Parasuraman et al., (1985), Cronin et al., (1992)). To gain student satisfaction, universities should concentrate and make efforts by delivering quality of teaching and non teaching services (Petruzzellis et al., 2006). By enhancing the quality of educational services, chemical engineering study program will able to produce qualified graduates that meet the local industry requirements and global acceptability.

Conclusion and Future Research

From the above findings it can be concluded that currently chemical engineering study program in private universities in Palembang are quite satisfying. University X gain the most satisfying among the three private universities, followed by University Y and University Z. From the independent sample t-test, it is indicated that the total students' satisfaction between the three private universities is significantly different with $p < 0.05$. The highest difference between University X and Y is in facilities and infrastructure, between University X and Z is in management, while between University Y and Z is in funding.

As for the contribution of total students' satisfaction, facilities and infrastructures aspect is the highest which contributed 62.7%, while management aspect is the lowest which is only 2%. In University X, facilities and infrastructures are satisfying whereas the mean is 3.718. On the other hand, the students of University Z are quite satisfied even though the completeness of laboratory, teaching media and library need to be improved.

However, chemical engineering study programs in private universities in Palembang need to provide better quality of educational services in order to retain students and gain competitive advantage. The above analyses also provide information useful for university administrators in decision making and continuous improvement in all aspect of students' satisfaction.

This study was conducted at a local level. Due to shortage of time, sample size was not so large, therefore the results of this study cannot be generalized. However, a more comprehensive study can be conducted by taking a larger sample size including all the students in chemical engineering study program not only in private universities but also public universities.

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