The Effect of Service Quality on Student Satisfaction and Student Loyalty:
An Empirical Study

Teddy Chandra[1], Martha Ng[2], Stefani Chandra[3], and Priyono[4]

Abstract

The study aims to observe the influence of service quality on student satisfaction and student loyalty in higher education institutions in Riau. The participants were 1,000 students of 13 universities and colleges in Riau. This study employed service quality as an exogenous variable, while student satisfaction and student loyalty became an endogenous one. Data were analyzed using Structural Equation Modeling (SEM) and Analysis of Variance (ANOVA) with SPSS21 and AMOS 21. The result indicated a positive influence of service quality on student satisfaction and a positive influence of student satisfaction on student loyalty. However, no influences were found about student quality on student loyalty.

Keywords: *Service quality, student satisfaction, student loyalty*

Introduction

For years, product quality has always been a concern. Measuring product quality manufactured in a factory is easier than the one in service industry. Despite its difficulty, the importance in measuring and controlling service quality needs to be carefully examined (Seth, Deshmukh, & Vrat, 2005). Tight competition among service industries urge those actors to continuously improve their services (Bolton, Lemon, & Verhoef, 2004). As a part of the industries, higher education such as university and college has to provide the best service quality to the students as well. Parasuraman, Zeithaml, & Berry (1988) introduced five dimensions in measuring service quality which help to determine customers' expectation and perception including tangibility, reliability, responsiveness, assurance, and empathy. There were researchers such as Afridi, Khattak, & Khan (2016); Arambewela & Hall (2006); Calvo-Porral, Lévy-Mangin, & Novo-Corti (2013); Kanakana (2014) as well as Yousapronpaiboon (2014) who used these five dimensions to measure service quality. However, others such as Abdullah (2006);

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[1] *Dr, Lecturer, Pelita Indonesia School of Business, teddy.chandra@lecturer.pelitaindonesia.ac.id*
[2] *Lecturer, Pelita Indonesia School of Business, marthang@gmail.com*
[3] *Lecturer, Pelita Indonesia School of Business, stefanichandra@staff.pelitaindonesia.ac.id*
[4] *Dr., Faculty of Economics Lecturer, Universitas Bina Darma Palembang, Indonesia, priyono@binadarma.ac.id*

Alves & Raposo (2007); and Duarte, Raposo, & Alves (2012) considered SERQUAL as less precise.

Good service quality results in the increase of customer satisfaction and leads to long-term benefits in market share and profitability (Anderson, Fornell & Lehmann, 1994). Nowadays, there is tight competition in higher education not only for the local market but also the international one. To reach a big market share, student satisfaction needs to be maximized and one of the strategies is providing a high quality service (Stevens, Knutson, & Patton, 1995). Studies on education service qualities are considered new in the commercial sector. Hence, it becomes a national priority (Sultan & Yin Wong, 2010). Indonesian government has emphasized on improving education quality, especially for higher education by merging the ministry of higher education and that of research and technology for the best result. Aside, the government allows foreign universities and college to join the local market. Therefore, it results in a tighter competition between local and international universities or colleges. Students prefer higher education that provides better service quality and student satisfaction (Tahir, Bakar, & Ismail, 2010) which either directly or indirectly affects student loyalty (Annamdevula & Bellamkonda, 2016b). When students are highly satisfied, they will be loyal to the chosen institutions (Alves & Raposo, 2009). The research done in India by (Annamdevula & Bellamkonda, 2016b) found positive relationships between service quality and student satisfaction, service quality with student loyalty, and student satisfaction with student loyalty. It was also supported by studies done by Duarte *et al*. (2012) on higher education in Portugal. Conversely, Dib & Mokhles (2013) who did a study in Syria found no significant relationship between service quality and student satisfaction. The same result goes to the relationship between student quality and student loyalty. However, they found significant relationship between student satisfaction and student loyalty. This research will reinvestigate the relationships between service quality and student satisfaction, service quality with student loyalty, and student sasfaction with student loyalty.

Riau is one of provinces in Indonesia neighboring to Malaysia and Singapore, and it has around 79 universities and colleges with 146,230 students. The competition faced by the local universities and colleges does not only come from Riau itself, but also from other provinces such as West Sumatra, North Sumatra, Riau Islands, provinces in Java, and even Malaysia and Singapore. According to Chen (2016), service quality determined a number of students enrolled in a university or college each year. This adds to the importance of measuring and evaluating

service quality provided by the institutions. Regarding its condition, the Indonesian government has already committed to improving the quality of higher education. To evaluate the service quality in Riau, studies were conducted mostly in the commercial sectors, and none has studied the education sectors, especially higher education.

The aims of this research are:

1. To examine the relationship between service quality and student satisfaction at higher education institutions in Riau Province.
2. To examine the relationship between service quality with student loyalty at higher education institutions in Riau Province.
3. To examine the relationship between student satisfaction with student loyalty at higher education institutions in Riau Province.

Literature Review

Prior studies on service quality on student satisfaction and student loyalty become the references to determine the structural model as well as the concepts of service quality, student satisfaction, student loyalty, and their relationships.

Service Quality

Parasuraman *et al*. (1988) introduced five dimensions of service quality which mostly are applied in repair and maintenance, retail banking, securities brokerage, long-distance telephone and credit cards, namely:

a. Tangibility : physical facilities, equipment, and appearance of personnel.
b. Reliability : ability to perform the service dependably and accurately.
c. Responsiveness : willingness to help customers and ability to inspire trust and confidence.
d. Assurance : knowledge and courtesy of employees and their ability to inspire trust and confidence.
e. Empathy : caring, individualized attention provided for customers.

This concept has been widely used to evaluate and measure service quality not only in commercial sectors but also in education sectors (higher education institutions) (Afridi *et al*., 2016; Arambewela & Hall, 2006; Calvo-Porral *et al*., 2013; Kanakana, 2014; Yousapronpaiboon, 2014). Yet, some critiques disagreed on this measurement. Nonetheless, no better measurement

for service quality both in general and in education sector has been found (Chen, 2016). Another measurement system introduced by Abdullah (2006) was Higher Education Performance-only offering a non-academic dimension, reputation access, and program issues. Chen (2016) in his study on higher education in Taiwan found that the factors for service quality in higher education were school, staff, and teacher. Studies conducted by Senthilkumar and Arulraj (2011) on higher education in India offered a model called SQM-HEI (Service Quality Measurement in Higher Education in India) consisting of three dimensions including teaching and methodology (TM), environmental change in study factor (ECSF), disciplinary action (DA) and placement as the mediator and the outcome as the quality education. Meanwhile, Annamdevula and Bellamkonda (2016a, 2016b) conducted a study on higher education in India and generated an instrument called Higher Education Quality. These showed that there is no exact standard to measure service quality on higher education. This study combined the existing instruments and adapted to the stakeholder's characteristics in Indonesia, especially in Riau Province.

The Relationship between Service Quality and Student Satisfaction

Understanding student satisfaction was highly related to service quality. Satisfaction is a customer response to the service provided (Tse & Wilton, 1998). According to Oliver (1989), customer satisfaction is fairness due to its value paid. This is in line with the ideas of Parasuraman, Zeithaml, & Berry (1985) that consumers can feel both satisfaction and dissatisfaction due to the service provided and the money paid. Customers are satisfied whenever services provided are more than the price paid, and they are dissatisfied whenever services provided are less than the price paid. Additionally, customer satisfaction does not always relate to complaints meaning that consumers who never complain do not necessarily mean that they are satisfied (Kitapci & Taylan, 2009). In higher education, the studies on student satisfaction are few due to its complexity (Marzo Navarro, Pedraja Iglesias, & Rivera Torres, 2005).

Theoretically, the relationship between service quality and student satisfaction remains unclear (Anderson *et al.*, 1994). The study conducted in India found a positive relationship between service quality and student satisfaction (Annamdevula & Bellamkonda, 2016a, 2016b), indicating that the increase in service quality was the increase in the student satisfaction. This is supported by Alves & Raposo (2009) and Duarte *et al.* (2012) who conducted studies in Portugal. Similarly, Khoo, Ha., and McGregor (2015) conducted a study in Singapore which

found the strong relationship between service quality provided by private tertiary education sector and student satisfaction. A study on Malaysian private education institutions found a positive relationship between tangibility which is one of the dimensions of service quality and student satisfaction (Mansori, Vaz, & Ismail, 2014). They discovered that tangible facilities in the private campus determine student satisfaction. However, a study conducted on higher education institution in Syria did not find any evidence about service quality influence on student satisfaction (Dib & Mokhles, 2013).

Considering prior studies on the relationship between service quality and student satisfaction, the first hypothesis was derived, namely:

H_1= *Service quality has a positive influence on student satisfaction.*

The Relationship between Service Quality and Student Loyalty

Duffy (2003) mentioned that customer loyalty is consumer behavior to maintain the relationship with an institution and repurchase its products and services. Customer loyalty is reflected on their recommending other people, repurchasing products and services, and increasing future business transaction (Zeithaml, Berry, & Parasuraman, 1996). A study done by Ngo & Nguyen (2016) on Vietnamese retail banking resulted in a significant positive influence of the service quality on customer loyalty. Heung, Mok, & Kwan (1996) in their research of the brand loyalty level on hotels in Hong Kong found a strong relationship between service quality and hotel brand loyalty. However, Cronin & Taylor (1992) found that customer satisfaction has a greater influence on customer loyalty than service quality did.

Zeithaml *et al.* (1996) mentioned that a good perception of service quality influences student behavior. Teaching quality and students' emotion of their commitment to institution increase student loyalty (Henning-Thurau, Langer, & Hansen, 2001). In addition to those studies, positive relationship between service quality and student loyalty was found in a study conducted in India (Annamdevula & Bellamkonda, 2016a, 2016b). They concluded that a loyal student was helpful for institution staff in determining the right promotion, and development as well as maintaining a long-term success (Annamdevula & Bellamkonda, 2016a). The opposite result was found by Dib & Mokhles (2013) in their study in Syria which found that there was no relationship between service quality and student loyalty.

Considering prior studies on the relationship between service quality and student satisfaction, the second hypothesis was derived, that is,

H₂ = Service quality has a positive influence on student loyalty.

The Relationship between Student Satisfaction and Student Loyalty

Cronin & Taylor (1992) stated that customer satisfaction influences customer loyalty more than service quality. The significant relationship between customer satisfaction and customer loyalty was also supported by Dib & Mokhles (2013). In the education sector, Annamdevula & Bellamkonda, (2016a & 2016b) found a firm relationship between student satisfaction and student loyalty, as was mentioned by Duarte *et al*. (2012) in their study in Portugal. Therefore, the third hypothesis was derived, that is:

H₃ = Student satisfaction has a positive influence on student loyalty.

Method

Research Design

This research used causal design or explanatory research whereby it examined the influence of service quality (X_1) on student satisfaction (Y_1), influence of service quality (X_1) on student loyalty (Y_2), and influence of student satisfaction (Y_1) on student loyalty (Y_2). Service quality is the exogenous variable, while student satisfaction and student loyalty are the endogenous variables. Structural Equation Modeling (SEM) was used in examining the influence. Furthermore, this study explained and tested the respondents' responses based on demographic profile using ANOVA (Analysis of Variance).

Path Diagram of Structural Model

Figure 1 shows the model used to examine the influence of service quality on student satisfaction and student loyalty.
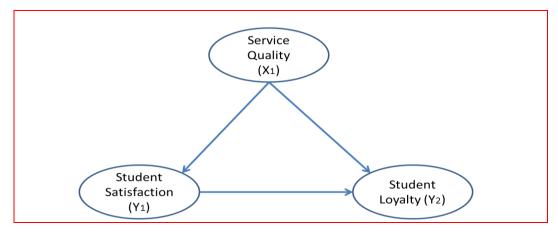
Figure 1. *Path Diagram of Structural Model*

Survey Instrument

The twelve-indicator instrument used to assess service quality was adopted partly from prior studies where one indicator was formulated by the researchers and other eleven were adopted from prior studies (Abdullah, 2006; Annamdevula & Bellamkonda, 2016a & 2016b; de Jager & Gbadamosi, 2010; Lagrosen, Seyyed-Hashemi, & Leitner, 2004; Mahapatra & Khan, 2007). Three of five indicators of student satisfaction were adopted from Annamdevula & Bellamkonda (2016a & 2016b) and the other two were formulated by the researchers. In the student loyalty instrument, two indicators were adopted from Annamdevula & Bellamkonda (2016a) and the others were formulated by the researchers. Further information provided in Table 1.

Table 1

List of Constructs and Indicators

Construct		Indicator	Source
Service Quality (X_1)	X_{11}	Teachers treat all students in equal manner	Annamdevula & Bellamkonda, (2016a & 2016b)
	X_{12}	Teachers follow good teaching practices	Annamdevula & Bellamkonda, (2016a & 2016b)
	X_{13}	Course content develops students' knowledge	Abdullah (2006); Annamdevula & Bellamkonda, (2016a & 2016b)
	X_{14}	Teachers are responsive and accessible	Lagrosen, Seyyed-Hashemi, & Leitner (2004)
	X_{15}	Administration staffs are courteous and willing to help	Mahapatra & Khan (2007)
	X_{16}	Administration maintains accurate and retrieval records	Abdullah (2006); Annamdevula & Bellamkonda, (2016a & 2016b)
	X_{17}	Classrooms are clean and comfortable	SELF
	X_{18}	Computer/science labs are well equipped	de Jager & Gbadamosi (2010)
	X_{19}	Library has adequate academic resources	Annamdevula & Bellamkonda (2016a)

Construct		Indicator	Source
	X_{110}	University provides counseling services	Abdullah (2006); Annamdevula & Bellamkonda (2016a)
	X_{111}	Campus environment is convenient to study well	Annamdevula & Bellamkonda (2016a)
	X_{112}	University has safety and security measures	Annamdevula & Bellamkonda (2016a & 2016b)
Student Satisfaction (Y_1)	Y_{11}	Satisfaction with the decision to study here	SELF
	Y_{12}	Satisfaction with the quality of academic services	Annamdevula & Bellamkonda (2016a & 2016b)
	Y_{13}	Feel comfortable to study here.	SELF
	Y_{14}	Satisfaction with the quality of teachers	SELF
	Y_{15}	Satisfaction with the quality of administrative services	Annamdevula & Bellamkonda (2016a & 2016b)
	Y_{16}	Satisfaction with the quality of equipment and facilities	Annamdevula & Bellamkonda (2016a & 2016b)
Student Loyalty (Y_2)	Y_{21}	This campus gives a positive impression to me	SELF
	Y_{22}	Recommending the campus to friends and family members	Annamdevula & Bellamkonda (2016a)
	Y_{23}	Feeling proud to be associated with the campus' activities	Annamdevula & Bellamkonda (2016a)
	Y_{24}	I will write a positive impression about this campus in social media	SELF
	Y_{25}	I have no intention of moving to another campus	SELF

All indicators for service quality, student satisfaction, and student loyalty were measured using seven-point Likert Scale with 1 (strongly disagree) to 7 (strongly agree).

Population and Sample

The population was 146,230 students registered in higher education institutions in Riau Province from 13 higher education institutions including 3 public universities, 2 private universities, and 8 private colleges. According to Sekaran (2003), a total population of 75,000 or more require a minimum sample of 384 people. This study distributed 1,100 questionnaires and collected 1,002. Two out of 1,002 questionnaires were eliminated due to incomplete information, meaning that there were 1,000 respondents and 90.91% of questionnaires were valid (n=1,000) as seen in Table 2 (by their institution), Table 3 (by their major selection), and Table 4 (by demographic profile including gender, age, university type, and occupation).

Table 2

Respondents by the Institution Origin

Number	Institutions	Number of Students	%
1	Riau University	298	29.80

Number	Institutions	Number of Students	%
2	Riau Islamic University	102	10.20
3	State Islamic University of Sultan Syarif Kasim II	105	10.50
4	STIA Lancang Kuning	83	8.30
5	STIKES Al Insyriyah	55	5.50
6	STIKES Hang Tuah	28	2.80
7	STIMIK Hang Tuah	20	2.00
8	Pelita Indonesia School of Business	109	10.90
9	Open University Pekanbaru	4	0.40
10	STMIK Dumai	77	7.70
11	Akademi Akuntansi Riau Dumai	43	4.30
12	Riau Muhammadiyah University	59	5.90
13	STIKES Awal Bros	17	1.70
	Total	1,000	100.00

The samples also include almost all types of majors as shown in Table 3. Hence, the samples represent the total population.

Table 3

Respondents by Selected Major

Number	Major	Number of Students	%
1	Business	540	54.00
2	Economic	168	16.80
3	Nursing	26	2.60
4	Public health	14	1.40
5	Midwifery	15	1.50
6	Medical Records	28	2.80
7	Computer Science	97	9.70
8	Master Management	59	5.90
9	Automotive Engineering	19	1.90
10	Biology	17	1.70
11	Radiology	13	1.30
12	Hospital Administration	4	0.40
	Total	1,000	100.00

Table 4 lists the profile of the respondents which includes gender, age, university type, and occupation.

Table 4

Respondents Demographic Profile

Demography	Category	Frequency	(%)
Gender	Male	299	29.90
	Female	701	70.10
Age	17 – 20	533	53.30
	21 – 24	414	41.40
	25 – 30	16	1.60
	> 30	37	3.70
University Type	Public University	407	40.70
	Private University/College	593	59.30
Occupation	Student	811	81.10
	Student and Work	189	18.90

In Indonesia, level of education is divided into diploma program (Diploma), undergraduate program (Bachelor's degree), graduate program (master's degree), and doctoral program (Ph.D.). This study was limited to diploma program, undergraduate program, and graduate program with the students aged from 17-20 years and study duration of 3 years for diploma program, 4-5 years for undergraduate program, and 2 years for graduate program. The average age of the new students for higher education is 17 to 20 years old. The first group of the respondents aged 17-20 years (having 1 year of study duration); the second group of the respondents aged 21-24 years (graduated diploma and undergraduate program); the third group of the respondents aged 25-30 years (graduated from undergraduate program and continue to graduate program); and the fourth group of the respondents aged more than 30 (working people and study in graduate programs).

The higher education institutions in Riau Province are differentiated into public and private universities or colleges where public universities are preferred by common students (fresh graduates of senior high schools) and private universities/colleges are preferred by working students.

The data collected were analyzed using Structural Equation Modeling (SEM) and Analysis of Variance (ANOVA) with IBM SPSS Statistics Version 21 and IBM AMOS Version 21. SEM was used to examine the causal relationship between service quality, student

satisfaction, and student loyalty, while ANOVA was used to examine the respondents' behaviors based on their demographic profile

Findings

Validity and Reliability Tests

The result of the analysis can only be utilized after the survey instruments have been tested. To do so, validity and reliability test were conducted and the result is indicated in Table 5.

Table 5

Validity and Reliability Tests

Construct	Indicator	Correlation	Loading Factor	*P value*	Construct Reliability	AVE
Service Quality (X_1)	X_{11}	0.606	0.603	***		
	X_{12}	0.779	0.781	***		
	X_{13}	0.645	0.641	***		
	X_{14}	0.697	0.695	***		
	X_{15}	0.794	0.788	***		
	X_{16}	0.805	0.810	***	0.945	0.588
	X_{17}	0.774	0.814	***		
	X_{18}	0.804	0.838	***		
	X_{19}	0.819	0.852	***		
	X_{110}	0.784	0.830	***		
	X_{111}	0.705	0.738	***		
	X_{112}	0.734	0.770	***		
Student Satisfaction (Y_1)	Y_{11}	0.769	0.841	***		
	Y_{12}	0.782	0.872	***		
	Y_{13}	0.814	0.862	***	0.912	0.634
	Y_{14}	0.744	0.775	***		
	Y_{15}	0.721	0.713	***		
	Y_{16}	0.702	0.696	***		
Student Loyalty (Y_2)	Y_{21}	0.736	0.838	***		
	Y_{22}	0.832	0.812	***		
	Y_{23}	0.841	0.824	***	0.901	0.647
	Y_{24}	0.777	0.813	***		
	Y_{25}	0.664	0.729	***		

*** = *p-value*< 0.01

The construct reliability was to measure the consistency and stability of the indicators in contributing to the construct. Table 5 shows that all constructs are more than 0.900 while the cut-off value is only 0.70 (Hair, Anderson, Tatham, & Black, 1998). Hence, all constructs are reliable.

Validity test was used to measure the accuracy of the measurement tools (the questionnaires). The questionnaires had to accurately measure certain indicators to be considered valid and the validity of the analytical instrument is possibly measured using correlation. The result shows that all indicators are greater than 0.600. Hence, it is considered valid. Based on the loading factor, all indicators have value greater than 0.600 with *p-value* smaller than 0.05, meaning that all indicators significantly give a contribution to their own constructs. In the confirmatory analysis, convergent validity can also be measured by loading factor which is called Average Variance Extracted (AVE) from the construct. The analysis result for AVE is all above the cut-off value (0.500) (Hair *et al*., 1998). Therefore, all indicators and constructs were possibly used for this study.

The Goodness of Fit in SEM

EM Model needed to be tested before it was used. The result can be seen in Table 6.

Table 6

Result of the Goodness of Fit

The Goodness of Fit Index	Cut-off*	Results	Fit Criteria
Chi-Square		1450.022	
Probability	≥ 0.05	0.000	Marginal
G F I	≥ 0.90	0.882	Marginal
A G F I	≥ 0.90	0.851	Marginal
T L I	≥ 0.90	0.926	Fit
C F I	≥ 0.90	0.936	Fit
N F I	≥ 0.90	0.926	Fit
I F I	≥ 0.90	0.936	Fit
RMSEA	0.05 - 0.08	0.075	Fit

* *source:*(Hair *et al*., 1998)

This study applied 8 measurements of the Goodness of Fit as seen in Table 6. It indicates that only five out of eight measurements are categorized as fit, namely: TLI, CFI, NFI, IFI, and RMSEA. Meanwhile, chi-square, GFI, and AGFI are categorized as marginal. The GFI value reaches 0.882 and AGFI value is 0.851, which is close to the critical value (0.9). Hence, it is not categorized as 'not applicable' and is still acceptable. The high value of chi-square and a probability value of 0.000 was caused by the big amount of sample (n=200). Therefore, the probability was not able to be calculated (Hair *et al*., 1998). Overall, the SEM model is good and still acceptable for further analysis.

Analysis of Variance

Analysis of Variance (ANOVA) was to examine different responses from respondents with various demographic profiles to have a better understanding of their behaviors, as is presented in Table 7.

Table 7

ANOVA Result for Age, Gender, University Type, Major, and Occupation.

| Construct | Indicator | Mean | | F-test | | | | |
		Indicator	Construct	Age	Gender	University Type	Major	Occupation
Service Quality (X_1)	X_{11}	5.456		4.350***	0.095	0.551	5.250***	1.205
	X_{12}	5.196		11.316***	1.137	13.988***	7.536***	0.003
	X_{13}	5.355		12.236***	0.022	0.174	7.939***	0.004
	X_{14}	5.370		8.320***	5.487**	0.388	4.812***	1.138
	X_{15}	5.256		11.345***	1.989	6.028**	7.463***	1.218
	X_{16}	4.950	5.258	13.796***	1.488	21.828***	9.043***	0.200
	X_{17}	4.914		15.571***	2.262	27.248***	8.314***	1.480
	X_{18}	5.338		10.267***	7.134***	50.350***	11.640***	3.665*
	X_{19}	5.267		8.934***	9.297***	50.000***	11.134***	2.661
	X_{110}	5.338		10.086***	5.823**	19.484***	8.401***	0.089
	X_{111}	5.286		4.680***	0.743	35.419***	6.397***	1.336
	X_{112}	5.367		4.250***	0.031	35.419***	7.492***	1.372
Student Satisfaction (Y_1)	Y_{11}	5.624		2.976**	1.252	0.567	5.379***	2.186
	Y_{12}	5.845	5.585	1.925	0.011	3.027*	3.964***	4.023**
	Y_{13}	5.664		2.788**	0.115	0.046	6.291***	2.607
	Y_{14}	5.690		2.518*	0.002	1.330	3.684***	2.161

| Construct | Indicator | Mean | | F-test | | | | |
		Indicator	Construct	Age	Gender	University Type	Major	Occupation
	Y_{15}	5.317		7.689***	1.404	14.635***	7.670***	0.110
	Y_{16}	5.372		3.002**	0.186	0.642	8.154***	0.200
Student Loyalty (Y_2)	Y_{21}	5.704		2.540*	0.009	1.478	6.145***	6.860***
	Y_{22}	5.593		4.477***	0.356	2.221	4.322***	3.608*
	Y_{23}	5.639	5.676	5.432***	0.384	1.343	3.814***	4.738**
	Y_{24}	5.610		2.839**	0.722	0.404	5.748***	11.363***
	Y_{25}	5.834		1.761	0.077	0.213	2.855***	0.680

*=P-value<0.1, **=P-value<0.05, ***=P-value<0.01

The average responses on service quality the respondents got from the campus are just normal (5.26). It indicates that the service quality of the existing higher education institutions in Riau Province is still not that good. The complaints generally revolved around the campus admin service in keeping and collecting data (4.95) and the less clean and comfortable classes (4.91). Meanwhile, based on the age range, students with the age of 21-24 years old complained a lot about the campus service quality (5.01). Students with the age above 30 years old gave good scores on the service quality they obtained (5.82). Most students with the age of 17-20 years old got good service quality from the campus. This was due to the new environment that they felt in the campus compared to their previous schools which made them to have higher tolerance level. As time passed, they did not notice any changes in the campus, hence, those students who have completed almost half of their studies would feel that the service was lower than expected. It explained the reason for lower scores on service quality for students with the age of 21-24 years old. The students with the age of 25-30 years old and above 30 years old are mostly pursuing master degree whereby the service given will be better. It made them experienced greater service quality compared to their juniors. Based on students' gender, women are generally more sensitive towards service quality than men. Women required the more responsive and contactable lecturers. They also asked for counseling service from the campus. Moreover, they demanded enhancement in the laboratory and library. They differ from the men who are generally more tolerant. Nevertheless, there was indifferent perception among students based on their working status.

Based on the university types, it turns out that service quality given by private university / college (5.40) was better than public universities (5.05). The plus points lies on the quality of lecturers in teaching, polite and helpful admin staff, well-kept and accessible database record, clean and comfortable classrooms, proper library and laboratory, existence of student counseling service, and safe and comfortable campus environment. Based on students' majors, the lowest service quality was felt by students majoring in nursing (4.63), followed by the business major (5.01). Nursing major was found in private universities / colleges, while business major was partly from the public universities. The best service quality was obtained by radiology students (6.21), followed by computer science students (6.18), and hospital administration students (6.06). These three majors were from private universities / colleges. It explains that despite lower service quality in public universities compared to private ones, the service quality in private universities / colleges did not spread evenly. Thus, variance quality among private universities was very big. The best and the worst service quality can be found in private universities / colleges.

Generally, the student satisfaction in this research was quite good (5.59). Based on the age range, students with the age of 21-24 years old were less satisfied. It was consistent with their low scores on service quality. Students with the age range from 25 to 30 above 30 had higher level of satisfaction along with their high scores in service quality. Based on gender, although women were more sensitive than men in service quality, they have equal level of satisfaction with the male students. Meanwhile there was not much difference in the perception of working and non-working students on satisfaction.

Based on the university status, despite the better scores on service quality for private universities / colleges, both private (5.59) and public universities (5.58) had indifferent overall scores for student satisfaction. Dissatisfaction of public universities students lies on the lower administration service (5.14). Reviewing from the students' majors, the dissatisfaction came from automotive engineering students (4.84), nursing students (4.94), and public health students (5.08). The satisfied students were found in hospital administration (6.29), radiology (6.18), and computer science (6.07). All these majors were from the private universities / colleges. These findings support the notion of high bias in private universities / colleges. The highest and the lowest student satisfaction can be found in private universities / colleges.

In general, the level of student loyalty in Riau Province was quite good (5.68). Based on the age range, students with the age of 21-24 years old were less loyal (5.54) than other students. It shows that the low service quality that they obtained resulted in lower satisfaction and made them to be less loyal. Based on the gender, there were no meaningful difference of student loyalty level between men and women. However, based on the students' working status, non-working students were more loyal (5.72) than the working ones (5.51). This is because non-working students were more active in the campus activities, hence, they had higher emotional bound than the working students.

Based on the university status, both public and private universities / colleges students had the same level of loyalty. Therefore, although the perception of service quality obtained by students in public universities was lower than private ones, student satisfaction for both types of universities / colleges was not too different. Based on the students' majors, the more loyal students were found in hospital administration (6.90), radiology (6.37), computer science (6.07), and economic (5.94).While the less loyal students were found in nursing (5.06), public health (5.13), and midwifery (5.13). These findings reinforced the idea that students who obtained higher level of service quality will be more satisfied and hence, become more loyal. Conversely, students who does not obtain good service quality will feel less satisfied and thus, less loyal. It is consistent with the study done by Annamdevula & Bellamkonda (2016a & 2016b) in India and Duarte *et al*. (2012) in Portugal.

Empirical results

After the test results of the survey and goodness of fit of the model were obtained, hypothesis testing was done using SEM which was seen in Table 8 and Figure 2.

Table 8

Final Estimation of Measurement Model Parameters

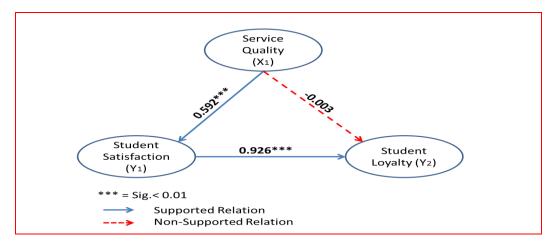| Hypotheses	Exogenous Variable	Endogenous Variable	Standardized Coefficient	Critical Ratio	*p-value*	Conclusion
H$_1$	Service Quality	Student Satisfaction	0.592	18.312	0.000	Significant
H$_2$	Service Quality	Student Loyalty	-0.003	-0.130	0.897	Insignificant
H$_3$	Student Satisfaction	Student Loyalty	0.926	25.188	0.000	Significant

Figure 2. *Final Estimation of Measurement Model Parameters*

Hypothesis 1 was accepted as service quality has a positive influence on student satisfaction, and it resulted in a positive and significant relationship. Hypothesis 3 was accepted as student satisfaction has a positive influence on student loyalty. However, hypothesis 2 was rejected as there was no significant influence on service quality and student loyalty.

Discussion, Conclusion and Implications

In conclusion, the results indicated that there were positive influences of service quality on student satisfaction, meaning that student satisfaction can be increased by improving service quality. This corresponds to the studies done by Alves & Raposo (2009); Annamdevula & Bellamkonda (2016a & 2016b); Duarte *et al.* (2012); and Khoo *et al.* (2015), yet it is different from the findings of the study conducted by Dib & Mokhles (2013).

The findings indicate that serious attention to service quality provided by universities and colleges in Riau Province is needed because the better the service qualities are provided, the higher the student satisfaction will be. These are suggested by the low rate of student satisfaction with the service quality given to the students in the age group of 21-24 years and students majoring nursing, public health, and automotive engineering. Important points for service quality improvement were in the class comfort, cleanliness and the accuracy of student administration data. For public university students, although the service quality provided was lower than the private institutions, it did not affect their loyalty due to their preference in selecting public universities. Nevertheless, it can become a serious problem if there are new and better universities/colleges in the future.

The score of service quality of higher education in Riau Province was 5.26 which was considered as normal. It shows that the service quality of higher education in Riau Province is still not that high. It will make the good students to opt for better education outside Riau Province, such as Malaysia and Singapore. Both Malaysia and Singapore are the closest neighbor countries to Riau Province with world class higher education quality. They indeed offered strong competitors. With the absence of world standard higher education institutions in Riau Province, both local universities / colleges and Indonesian government are facing high challenges in improving higher education quality in Riau Province.

This research did not found any influence of service quality on student loyalty. Therefore, the improvement in service quality of higher education in Riau Province will not have much effect on the student loyalty. This finding corresponds with the study conducted by Dib & Mokhles (2013). On the other hand, student satisfaction had a significant influence on student loyalty, meaning that satisfied students will be more loyal. This finding is consistent with the research done by Annamdevula & Bellamkonda (2016a, 2016b); Duarte *et al*. (2012). Good service quality does not guarantee student loyalty, but the well-accepted one can increase student satisfaction which leads to student loyalty. Measuring service quality without measuring student satisfaction was not effective to increase student loyalty. As was revealed by Dib & Mokhles (2013) in their study in Syria, they found the influence of student satisfaction to student loyalty. However, there was no evidence of the effect of service quality to student loyalty. Therefore, students who are satisfied due to good service quality have more loyalty, proved by the students in the age group of 21-24 years who got lower service quality had lower student satisfaction and student loyalty. The same result was obtained based on student majors. On the contrary, based on the university type, despite the low service quality received by students in public universities/colleges, they did not lower their satisfaction and had a higher loyalty than students in private universities/colleges.

The competition among higher education institutions in Riau Province and other places is very tight and pushes universities and colleges to keep improving their service quality in order to meet the market demands. A good service quality increases the student satisfaction and leads to student loyalty because the level of service quality determines the number of students enrolled in universities/colleges (Chen, 2016). Students prefer universities and colleges that provide good service quality and high satisfaction (Tahir *et al*., 2010). For private institutions, improvement in

service quality is compulsory. Campus facilities are important points, especially classroom facilities, cleanliness and comfort, and improvement in student administration data. It corresponds with a study in Malaysia (Mansori *et al*., 2014) which found the importance in improvement of campus facilities in private universities.

From the respondents' responses, students from hospital administration and radiology had the best service quality, student satisfaction, and student loyalty. However, the hospital administration only consisted of 4 respondents and radiology with 14 respondents; hence, these numbers are not able to represent the whole students in these majors. The future research should reinvestigate with more respondents especially in these two majors to examine the consistency of this study.

Since the determination values (R^2) are 0.350 (Student Satisfaction) and 0.854 (student loyalty), further studies need to be conducted to examine the result consistency and improve the determination by adding new variables. One possible variable is the image of an institution, especially for public universities. Regarding the characteristic differences of the respondents between public and private universities/colleges, it is necessary to conduct research looking into the two types of universities separately in the future.

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