PLS-SEM BASED ANALYSIS OF SERVICE OF LEARNING, SERVICE QUALITY AND SATISFACTION OF COLLEGE STUDENT IN POLYTECHNIC

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ABSTRACT

The development of science and technology as well as factors of ASEAN Economic Community (AEC), which is supported by an increase in industrial 4.0, the government provides an important responsibility for universities to be able to produce human resources that can compete on the era. This affects one of the colleges of polytechnics to continue to improve in terms of the quality of learning, service quality, to give effect to satisfaction with students. Related to that, conducted this study of 120 samples of student respondents to the questionnaires are processed by Structural Equation Modeling (SEM) - Partial Least Square (PLS). Based on the analysis and discussion, it can be concluded that the quality of learning and service quality has positive influence on student satisfaction.

KEYWORDS: Quality, Learning, Service & College

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Original Article

INTRODUCTION

Currently, the development of service industries continue to increase along with technological developments and global markets, which give rise to the quality competence of Human Resources(Truong, Pham, & Vo, 2016). The influence of global market makes the education sector becomes questionable as a place for students to be able to fulfill the requirements, have expertise and distribution to be able to compete with the international market. These three things must be approved by each institution involved with both education and training.

MIP is one of the Polytechnics as a start-up company, who works in service industry, service quality is the main thing that becomes an important consideration to be able to attract customer attention to achieve customer satisfaction(Rosita & Larso, 2016). As many scholars have indicated, quality and satisfaction are related to customer loyalty(Hsieh, Lu, & Lu, 2018). The college continues to strive to improve service quality continuously according to the gap between services provided by services obtained by students. The significance of services related to the quality that is an indication of the suitability of a service with predetermined objectives where reliability, robustness, and the right time in the meaning of integrity, so as to satisfy the customer. Based on the description above, this research was conducted to be able to propose the application of ServQual (Service Quality) with the hypothesis testing method of data distribution questionnaire to students to obtain the effect of service quality on college student satisfaction in polytechnic.

STUDY LITERATURE

Service of Learning (IP)

Quality has a definition as a level, quality, level of good or bad something. While the definition of learning is the process or way of making people learn which functions to guide students in their lives, namely guiding and developing themselves according to the developmental tasks that must be carried out. Interactions in teaching and learning events have a broader meaning not only in the relationship between the teacher and students, but in the form of educational interaction. In this case not only the delivery of messages in the form of subject matter, but the planting of attitudes and values in students who are learning who can help the development of potential that can benefit themselves, society and the State(Razaq, 2014).

Service Quality (IL)

In general, the quality is a measure that states how much the fulfillment of the requirements, specifications, and consumer expectations. So that a company must adjust quality to customer needs in order to provide satisfaction to customers(Hernadewita & Hidayati, 2016).According to Parasuraman Zeltham, I & Berry states that there are ten criteria and dimensions of service quality including: (1) Reliability, (2) Responsiveness, (3) Competence, (4) Accessibility, (5) Courtesy, (6) Communication, (7) Credibility, (8) Security, (9) Understanding / knowing customers, (10)Tangibility(Parasuraman, 1988).

Evaluation of a service quality from the overall superiority of this service is the customer's perception of all assessments or attitudes related to service excellence(Perera et al., 2017). There are three-dimensional view of a quality of service that interaction, physical quality and the quality of the company(Quddus & Hudrasyah, 2014).

Satisfaction of Customer (IK)

Consumer satisfaction or dissatisfaction is the response of consumers to the evaluation of perceived discrepancies between previous expectations and the actual performance of products that are perceived as users(Tjiptono, 2003). Satisfaction reflects a person's judgment regarding product performance in relation to expectations. Whereas consumer satisfaction is the result (outcome) that is felt by the user of the product or service, the same or exceeding the desired expectations. In measuring customer satisfaction, there are four methods that are widely used(Kotler, 2005) including:

System of Complaints and Suggestions

Additional Costs

Lost Customer Analysis

Consumer Satisfaction Survey

Consumer satisfaction (students) is an evaluative post-consumption with respect to a particular product or service. Expectations to be achieved by students, who enter PTS include such as satisfaction, pleasure and pride as students in these colleges(Ester & Bowen, 2005). In achieving these expectations of students, they spend more sacrifices in the form of funds to pay for education administration, and the time spent can be calculated as opportunity costs. The indicators used include the quality of learning and the quality of services as shown in Table 1(Maulidyah, 2006).

Table 1: Quality Indicators for Consumer Satisfaction (Y1)

Code	Indicator
IKM1	Variable Performance Expectancy
IKM2	Effort Expectancy
IKM3	Social Influence

Effect of Learning Quality with Satisfaction of College Student

Learning or teaching and learning activities are active interactions between lecturers and students, where lecturers manage learning resources (including themselves) to provide learning experiences to students. The indicators used for measuring the quality of learning are as shown in Table 2(Sugandini, 1999). All quality factors that exist at the level of the quality of learning must create added value for students as consumers. Therefore, this hypothesis is:

H1: There is an influence between learning quality variables and variables satisfaction college student

Table 2: Indicators of Learning Quality (X1)

Code	Indicators
IP1	**Knowledge**; is the level of ability and insight of lecturers in delivering material that can make students understand and understand
IP2	**Enthusiasm**; is the concern, friendliness and quick response of lecturers to requests for assistance from students regarding the learning process
IP3	**Learning Media**; is the effectiveness of the use of learning media (LCD, practicum tools) by lecturers in the learning process
IP4	**Communication**; is a positive trait of lecturers (honesty, discipline and responsibility in teaching and the ability of lecturers to communicate well)
IP5	**Student Learning Difficulty Guidance**; the willingness of faculty to take time for students to consult

Effect of Service Quality with Satisfaction of College Student

In the service industry, one of the college there are six dimensions of quality of service, namely: non-academic aspect, academic aspect, reputation, access, program issues, and understanding. The most effective testing of the six dimensions of service quality in the service industry is the HEdPERF method as shown in Table 3(Abdullah, 2006):

Table 3: Service Quality Indicators (X2)

Code	Indicators
IL1	***Non Academic Aspect*** "Covers the part felt by students to be important to be considered by universities in order to assist students in completing their studies"
	Willing to help solve the problem of student Care and attention to the students' personal problems Having the ability to deal with and resolve complaints from students efficiently Willing to respond immediately to requests for student assistance Services with information that is accurate and reliable Take responsibility and fulfill the promises given Opening hours of service that are tailored to the student's break hours Having positive attitudes Have good communication skills The system of administrative service procedures are easy to understand

	Providing comfort in obtaining service Opening and closing hours of service in a timely
IL2	***Academic Aspect*** "It is the responsibility of higher education related to academic service activities (teaching and learning), in this case it is the duty of the lecturer to provide maximum services related to teaching and learning activities or in helping students complete their studies"
	Provide lecture material that can make students understand and understand Demonstrate concern for students and are friendly in serving students Respond to requests for assistance from students Willing to help student problems sincerely Having positive attitudes Have good communication skills Provide feedback on student learning progress Spend sufficient time to provide consultation for students
IL3	***Reputation*** "Are factors related to the professional image of a college"
	Having a good professional reputation Has boarding facilities and facilities Have completeness academic facilities (buildings, classrooms, libraries, laboratories, etc.) There are not too many class students Has a service quality assurance program (such as ISO series) Has recreational facilities (shady garden, student gazebo, large parking lot) Well-accredited study programs Campus locations that are easily accessible by public transportation Lecturers who are well educated and experienced The campus's reputation makes easy graduates get jobs
IL4	***Access*** "It is the convenience of students in dealing with all academic and non-academic staff as well as the comfort of students while being a college student"
	Provide the same treatment and respect to all students in any service Providing equal justice and freedom to all students in any service Maintain the confidentiality of student information Providing convenience to students to contact all academic and non-academic staff Providing convenience for students to channel their talents and interests by organizing Giving feedback on the progress of student learning outcomes Have a procedural service system
IL5	***Program Issues*** "Relates to the importance of offering programs and structures of lectures varied lecture program are varied and flexible study program structure"
	The college has a course that varies The study program has a flexible syllabus (non-binding)
IL6	***Understanding*** "is a service related to understanding the needs of the students personally"
	Availability of student counseling services Availability of student health services

Thus, whether or not the quality of service is not the point of view or perception of the service provider, but based on consumer perceptions. Therefore, the hypothesis is:

H2: There is a positive influence between the variables of service quality to variable satisfaction of college student

Structural Equation Modelling – Partial Least Square (SEM-PLS)

PLS is an alternative approach that shifts from a covariant-based SEM approach to variant based. Covariance based SEM generally tests causality / theory, while PLS is more predictive model (Hermawan & Hasibuan, 2018). In SEM-PLS there are two models, namely the inside and outside models. Test criteria were carried out on the second models (Sanjiwani, 2015):

Outer Model (Measurement Model). This model specifies the relationship between latent variables and their indicators. The external model also defines how each indicator relates to its latent variables. Tests carried out on external models: Convergent Validity, Discriminant Validity, Composite Reliability, Average Variance Extracted (AVE), and Cronbach Alpha. The test carried out above is a test on the external model for reflective indicators. For formative indicators different tests are carried out. Tests for formative indicators are weight significance and muticoliniearity. There are two tests for formative indicators, namely nomological and external validity. Outside the model, there are two types of reflective and formative.

Inner Model (Structural Model). The structural test of the model is done to resolve the relationship between latent constructs. There are several tests for structural models, namely: R Square on endegon constructs, Estimate for Path Coefficient, Effect Size (f squared), Relevance Prediction (Q squared) otherwise known as Stone-Geisser's.

METODOLOGY

The data used in this study are primary data obtained by distributing questionnaires to MIP students from Industrial Engineering, Computer Engineering, and Pharmacy Study Programs. The sample size used in the study was 120 samples analyzed by the Structural Equation Modeling (SEM) - Partial Least Square (PLS) method with the SmartPLS version 3.0 program. The research model is shown in Figure 1.

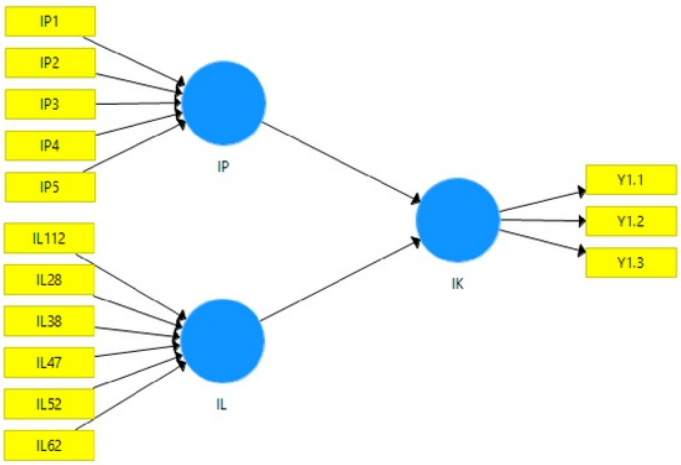

Figure 1: Research Model

The data analysis technique used in this study uses Structural Equation Modeling (SEM) - Partial Least Square (PLS) with test criteria, namely outer model and inner model. Test criteria carried out on both models:

Outer Model (Measurement Model). This model specifies the relationship between the latent variables and the indicators by testing them:

- Convergent Validity, is the value of loading factors on latent variables with their indicators. Expected value> 0.7. Convergent validity is considered to meet the requirements or is said to be valid if the loading value is 0.5 to 0.6(Ghozali, 2014).
- Discriminant Validity, is a value of cross loading factor that is useful to find out whether the contract has an adequate discriminant by comparing loading values to the intended construct must be greater than the value of loading with another construct.
- Average Variance Extracted (AVE) with the expected value> 0.5.
- Composite Reliability, is data that has composite reliability> 0.8 which means it has high reliability.

Inner Model. Tests on structural models are conducted to test the relationship between latent constructs. Some tests for structural models are:

- R-square is the coefficient of determination with an assessment value of 0.67 (strong), 0.33 (moderate) and 0.19 (weak)(Ghozali, 2014).
- Estimate for Path Coefficients, is the value of the path coefficient or the magnitude of the relationship or the effect of latent constructs carried out by the bootstrapping procedure.

RESULTS

Evaluation of Outer Models

Convergent Validity

Convergent validity explains the ability of each indicator to explain the research variables studied. There are three measurements for the result of outer loading including the original sample estimate which explains the high and low ability of the indicator in explaining the variables studied, the higher the original value of the estimate, the higher the ability to explain the measured variables. The mean of subsamples explains the average value of the indicators studied. Standard deviation describes the uniformity of respondents, where the smaller standard deviation means that the more uniform responses. The results of the correlation between the indicator and the construct are shown in the output of Table 6 below.

Table 6: Convergent Validity

	IL		IP		IK
IL112	0.766	IP1	0.875	Y1.1	0.813
IL28	0.993	IP2	0.842	Y1.2	-0.390
IL38	0.794	IP3	0.752	Y1.3	0.929
IL47	0.766	IP4	0.687		
IL52	0.603	IP5	0.602		
IL62	0.681				

From the results of data processing, indicators on variables have a high original sample estimate and mean of subsamples value which is <0.5, the standard deviation value that leads to 0 so that each indicator can be used for further data processing.

Discriminant Validity

Based on the data presented in Table 7, it is known that Fornell-Larcker Criterion each indicator in the research variable has the greatest value on the variables it forms compared to the values on other variables. Output discriminant validity from the results of data processing as shown in Table 7 below.

Table 7: Fornell-Larcker Criterion

	IK	IL	IP
IK	0.886		
IL		0.945	
IP		0.689	0.720

Average Variance Extracted (AVE)

AVE represents average variance extracted for each indicator, so the ability of each item in sharing with other measurements can be known. The results of AVE data processing are shown in Table 8.

Table 8: Average Variance Extracted (AVE)

	AVE
IK	0.784

In Table 8 obtained AVE value for the variable student satisfaction variables (Y1) of 0.784. All variables were above the critical limit of 0.5, and then all the indicators in each construct were valid with other items in a single measurement.

Composite Reliability

Results composite reliability can be seen in Table 9. Table 9 can be explained by that the composite value good reliability due to the results obtained in the above 0.6.

Table 9: Composite Reliability

Konstruk	Composite Reliability
IK	0.879

Evaluation of Inner Models

Collinearity Assessment, has been fulfilled based on Table 10 VIF inner model value <5

Table 10: VIF Inner Model

	IK
IL	2.077
IP	2.077

Structural Path Coefficient Model, based on Figure 2 and Table 11 the value of the T-statistic of all variables is greater than 1.96 and the value of P-value <α (0.05) so that we can say that the inner model is very significant.

Table 11: Coefficient and Effect Evaluation of Structural Model

	Standard Deviation (STDEV)	T Statistics	P Values
IL -> IK	0.048	19.521	0.000
IP -> IK	0.063	0.290	0.772

Based on Table 11, above can be explained as follows:

- The quality of learning (X1) has a negative influence on Student Satisfaction (Y1), because the T-statistic value is 0.290, which means it is smaller than 1.96 so that the H1 hypothesis can be declared rejected
- Service quality (X2) has a positive influence on Student Satisfaction (Y1) because the T-Statistic value is 19,521 which means greater than 1.96 so the H2 hypothesis can be declared acceptable

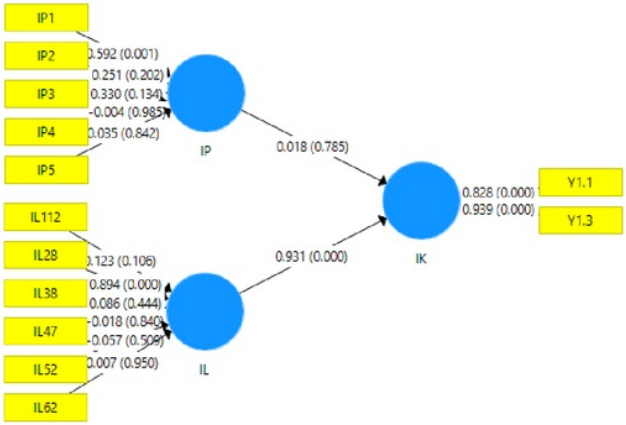

Figure 2: Result of Structural Model

Coefficient of Determination, based on Table 12, the R^2 value of 0.75 is considered to have large prediction accuracy.

Table 12: Determination Coefficient

	R Square
IK	0.892

Based on the value of R2 in Table 9 above, it can be seen that the value of R2 for the construct variable of student satisfaction is 0.892; this value explains that the amount of student satisfaction can be explained by the indicator of 89.2%.

Goodness of Fit

Based on data processing, R-square values were obtained as shown in Table 13.

Table 13: Construct Table

	R Square
IK	0.892

Based on the value of R2 in Table 13, it can be seen that the value of R-square for the construct variable of student satisfaction is 0.892, this value explains that the amount of student satisfaction can be explained by the indicator of 89.2%.The latent variable quality of learning and service quality that affects the variable student satisfaction in the structural model has an R-square value of 0.892 which indicates that the model is "substantial". Suitability of structural models can be seen from Q^2, as follows.

Q^2= 1 – [(1-R-square)] = 1 – [(1 – 0.892)]

= 0.108

The result of Q2 achieved is 0.108 means that the value of Q2 above zero gives proof that the model has predictive relevance.

CONCLUSIONS

Based on the results of the study, several conclusions can be drawn, namely (1) the quality of learning does not affect Student Satisfaction, and (2) the quality of service influences Student Satisfaction. This research still has shortcomings in its use and function, the authors provide suggestions, namely to be able to do additional constituents that can increase the productivity of higher education seen from external factors.

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