

The Development of Student Satisfaction Assessment Instrument Toward Academic Service in Mathematics Department, Andalas University

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ABSTRACT

The Mathematics Department, Andalas University need to provide good service to ensure their students satisfaction toward academic services. This study aims to design an instruments to assess student satisfaction related to the quality of academic services and to analyze student satisfaction toward the quality of academic services in Mathematics Department, Andalas University and get recommendations regarding aspects of academic services that need to be considered. A survey conducted on Mathematics Department students showed that students were satisfied with academic services in Mathematics Department (CSI = 77.89%). By using Importance-Performance Analysis, it is known that the Mathematics Department needs to prioritize improvements to attributes : collection of books and other references in library, internet availability and quality, availability of clean student toilets, availability of lecture system manuals, the suitability of the material being tested and what is being taught, equal treatment and attention from lecturers to students, and support for students in developing achievements according to their interests and talents.

Keywords: *Student satisfactory, Academic services, CSI, Importance-Performance Analysis.*

1. INTRODUCTION

University is an educational institution that aims to produce quality human resources. As a strategic sector, universities are faced with the globalization of higher education, which creates very competitive competition between universities. The emergence of this competition requires universities to pay attention to the quality of education and institutions so that they can win the competition. Naturally, inferior universities are not in demand, which will be seen from the number of new students who enroll. Over time, this will certainly threaten the existence of the university.

The concept of quality must be integrated into a system. Poor quality in a part of the education system will reduce the overall quality of the system. For a university, in addition to the quality of the resources it

produces, the quality of services it provides to the students as their customers is an important thing to pay attention to. Universities that provide quality services to their customers will be successful in achieving their goals in producing quality graduates. Therefore, service quality should be used as a strategy for universities to create customer satisfaction.

Service quality should be centered on meeting the needs and desires of customers as well as the accuracy of delivery. This can be measured by comparing the customer's expectations for the ideal service with the performance of the service they actually receive. The quality of service depends on the ability of service providers to consistently meet the expectations of their customers. If the service received or felt is as expected, the service quality is perceived as good and satisfying, whereas if it exceeds customer expectations, the service

quality is perceived as ideal. Conversely, if the service received is lower than expected, then the quality of service is perceived as poor. According to [1], the measurement of service quality is based on the following indicators: (1) Tangibles, (2) Reliability, (3) Responsiveness, (4) Assurance, and (5) Empathy. These indicators are commonly known as the servqual dimension.

The Mathematics Department, Faculty of Mathematics and Natural Sciences is part of Andalas University which is also required to always provide good service to ensure customer satisfaction, in this case, the students of the Mathematics Department, Andalas University. Assessment of student satisfaction with the academic services of the Mathematics Department in particular and Andalas University, in general, has been carried out by requiring students to fill out a questionnaire when filling out the Study Plan Card. However, the questionnaire only assessed the performance of services received by students without considering the student's needs for these aspects of service. As a result, aspects that are considered unsatisfactory, even though these aspects are not really needed by students, are still considered as aspects that need to be improved. Also, not all aspects of measuring service quality were measured in the questionnaire.

For that, we need a more complete instrument that measures students satisfaction with academic services that include service performance and also considers student needs for these aspects of the service.

The objectives of this study are:

- a. Designing an instruments to assess student satisfaction related to the quality of academic services in the Mathematics Department, Andalas University.
- b. Analyze students satisfaction toward the quality of academic services in Mathematics Department, and get recommendations regarding aspects of academic services that need to considered and improved by the Mathematics Department.

2. METHODS

2.1. Sample

A total of 135 students who experienced academic services in the odd semester 2019/2020 in the Mathematics Department were samples in this study. Sampling was carried out using purposive sampling method.

2.2. Data Collection

Data collection was carried out using a questionnaire consisting of five quality dimensions which were broken

down into 50 attributes. All questions have been tested for validity using the Pearson correlation coefficient and tested for reliability using the Cronbach Alpha coefficient.

2.3. Data Analysis

In this study, the questionnaire was constructed based on 5 dimensions of service quality as proposed by [1]. Furthermore, an analysis of student satisfaction related to academic services is carried out by comparing student expectations regarding each attribute of the service with the services they received.

Data analysis was performed using Customer Satisfaction Index and Important – Performance Analysis.

2.3.1. Customer Satisfaction Index (CSI)

Customer Satisfaction Index (CSI) is the level of overall customer satisfaction by considering the importance of the attributes of the service being measured. CSI is defined as:

$$\frac{\sum \text{performance average} \times \text{weighting factor}}{n} \times 100\% \tag{1}$$

where \bar{x} is performance average, w_i is weighting factor formulated as $w_i = \frac{1}{\sum w_i}$ and n is performance average.

Student satisfaction assessment is carried out based on the Table 1.

Table 1. Customer Satisfaction Index

CSI	Customer satisfaction
CSI > 80	Highly satisfied
60 < CSI ≤ 80	Satisfied
40 < CSI ≤ 60	Slightly satisfied
20 < CSI ≤ 40	Slightly unsatisfied
0 < CSI ≤ 20	Unsatisfied

2.3.2. Important-Performance Analysis (IPA)

IPA is a technique developed by [2] that measures consumer satisfaction with a product/service. This analysis links the importance level of an attribute possessed by a particular product/service with the reality or performance perceived by the user. This technique helps to understand customer satisfaction. Besides, this technique can also be used to place a priority on every quality attribute, as well as determine which improvements are needed [3][4].

Within the IPA method, the level of importance and performance is represented graphically in a two-

dimensional space. During its development, many experts have modified the appearance of this diagram and how to interpret it. This research uses the Data Center Quadrant Model, which was also developed by [2]. as shown in Figure 1.

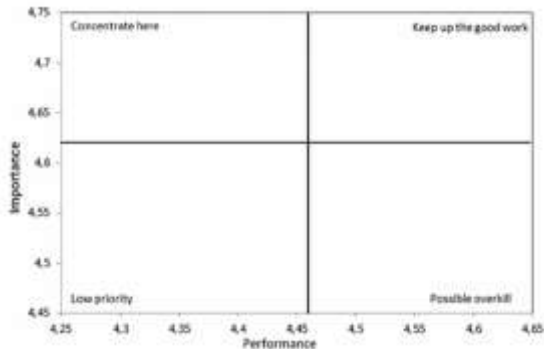


Figure 1 Data Centered Quadrant Model [5].

Using this model, the quality attributes are assigned to 4 quadrants, each of which represents priority. The four quadrants are [5]:

1. 'keep up the good work' quadrant (Quadrant A)
2. 'concentrate here' quadrant (B Quadrant B)
3. 'low priority' quadrant (Quadrant C)
4. 'possible overkill' quadrant (Quadrant D)

3. RESULTS AND DISCUSSION

3.1. Designed Questionnaire

Customer satisfaction is the one of the most important factor for institution that provides service, including educational institution. There are many definition of customer satisfaction. Oliver [6] defined customer satisfaction as the consumer's fulfillment response. In contrary, Kotler [7] stated that customer satisfaction is "a person's feelings of pleasure or disappointment resulting from comparing a product's perceived performance in relation to his/ her expectations".

In this study, a questionnaire was developed to measure student satisfaction which is related to academic services in the Mathematics Department. According to [7], the measurement should include measuring student expectations of academic services and their satisfaction with these services. The service dimensions to be measured consist of 5 dimensions as developed by [1], namely:

1. Tangible; this dimension relates to: physical facilities (study rooms, libraries, internet access, etc.), equipment (books, computers) and also the appearance of academic and non-academic staff. This dimension is broken down into 10 attributes, namely:

- cleanliness of the lecture hall, laboratories, reading room, etc (A1),
- room layout (seating position, table, whiteboard etc.) (A2),
- availability of learning facilities (projectors, whiteboards and other equipment) in the lecture hall (A3),
- computer laboratory facilities (A4),
- collection of books and other references (A5),
- internet availability and quality (A6),
- availability of clean student toilets (A7),
- availability of parking space (A8),
- staff appearance (A9),
- availability of lecture system manuals (A10).

2. Reliability. This dimension relates to the ability of the Mathematics Department to provide academic services as promised. This dimension is broken down into 11 attributes, namely:

- availability of clear RPS for each course (B1),
- availability of teaching materials (textbooks, handouts, presentation materials, etc.) (B2),
- a balance between theory-real world cases(B3),
- availability of elective courses (B4),
- the suitability of the duration of lecture delivery (B5),
- completeness of course material as planned (B6),
- the suitability of the material being tested and what is being taught (B7),
- objectivity and transparency in grading (B8),
- competence of lectures (B9),
- competence and quality of service provided by academic staff (B10),
- opportunities for discussion during and after lectures (B11).

3. Responsiveness; It refers to the availability of the Mathematics Department to provide a service with precision and speed of response. This dimension is broken down into 5 attributes, i.e:

- department's attention and assistance to problems (academic / non-academic) faced by students (C1),
- assistance in the process of obtaining scholarships (C2),
- fast, precise and efficient service from academic staffs (C3),
- warning and attention for students who are threatened with dropping out (C4),
- sanctions for students who cheat (C5),
- efficient KRS filling process(C6).

4. Assurance: Assurance: it is identified as the courtesy, knowledge of employees and their ability to convey trust. This dimension is broken down into 5 attributes, i.e:

- lecturer competence in the courses he/she teaches (D1)

- lecturer pedagogic skills (D2),
- the ability of administrative staff to provide good administrative services (D3),
- polite and friendly attitude and language shown by lecturers (D4),
- polite and friendly attitude and language shown by academic staffs (D5).

5. Empathy: it is related to whether the Mathematics Department cares for their student, understands their need and assists them in an individualized manner. This dimension is broken down into 4 attributes, namely:

- equal treatment and attention from lecturers to students (E1),
- assistance to students who experience problems in understanding lecture material (E2),
- academic advisor's attention (E3),
- support for students in developing achievements according to their interests and talents (E4).

The results of the validity test conducted on each attribute indicate that all of these attributes are valid to be used to measure student perceptions on the importance of attributes and student satisfaction related to the academic service, with a Pearson correlation coefficient > 0.75 and p-value = 0.000.

The test results on the reliability of the questionnaire provide a Cronbach alpha coefficient of 0.934 for the level of importance and 0.983 for the level of satisfaction, which means that the questionnaire is reliable.

3.2. Students Satisfaction on Academic Services

The survey was conducted on 135 students. 18 of whom were students from 2016 intake, 33 from 2017 intake, 67 from 2018 and 15 from 2019 intake.

Based on survey data, the index of student satisfaction related to academic services was calculated, as shown in Table 2.

Table 2. Measurement of The Satisfaction Index

Attribute	Importance		Performance	
	IA	WF	PA	WS
A. Tangible				
A1	4,535	0,029	4,000	0,116
A2	4,439	0,028	3,922	0,111
A3	4,628	0,030	3,915	0,116
A4	4,636	0,030	4,124	0,122
A5	4,550	0,029	3,628	0,105
A6	4,589	0,029	3,240	0,095
A7	4,643	0,030	3,310	0,098
A8	4,349	0,028	3,403	0,095
A9	4,093	0,026	4,147	0,108
A10	4,504	0,029	3,760	0,108

Attribute	Importance		Performance	
	IA	WF	PA	WS
B. Reliability				
B1	4,252	0,027	4,074	0,111
B2	4,589	0,029	3,899	0,114
B3	4,295	0,027	3,589	0,099
B4	4,202	0,027	3,907	0,105
B5	4,352	0,028	3,924	0,109
B6	4,380	0,028	3,992	0,112
B7	4,589	0,029	3,891	0,114
B8	4,477	0,029	3,965	0,113
B9	4,429	0,028	3,884	0,110
B10	4,349	0,028	4,016	0,112
C. Responsiveness				
C1	4,442	0,028	3,930	0,112
C2	4,512	0,029	4,054	0,117
C3	4,403	0,028	3,969	0,112
C4	4,519	0,029	4,178	0,121
C5	4,217	0,027	3,930	0,106
C6	4,543	0,029	3,899	0,113
D. Assurance				
D1	4,519	0,029	4,140	0,120
D2	4,643	0,030	3,907	0,116
D3	4,481	0,029	3,922	0,112
D4	4,574	0,029	4,147	0,121
D5	4,550	0,029	4,070	0,118
E. Empathy				
E1	4,597	0,029	3,860	0,113
E2	4,581	0,029	3,969	0,116
E3	4,543	0,029	4,008	0,116
E4	4,481	0,029	3,760	0,108
Total	156,48			3,894

From this table, it can be calculated the CSI value :

$$= \frac{3,894}{5} \times 100\% = 77,89\%$$

The Student Satisfaction Index for academic services in the Mathematics Departement is 77.89% which means that students are satisfied with the academic servicea.

3.3. Important – Performance Analysis

Although in general, students were satisfied with the academic services, but with the CSI score = 77,89%, several aspects of service still needed to be improved. Improvements can be done in stages and it is necessary to determine priorities for these academic service attributes.

Improvement priority determination for attributes is done by using Importance-Performance Analysis. With this method, the importance and performance of all service attributes are described in two-dimensional space. The model used is the Data Center Quadrant

Model. With this model, the IPA Diagram is divided into 4 quadrants based on the average of all attributes of interest and performance. The position of each attribute in each quadrant shows the priority of these attributes.

Based on survey data, an IPA diagram is obtained as shown in Figure 2.

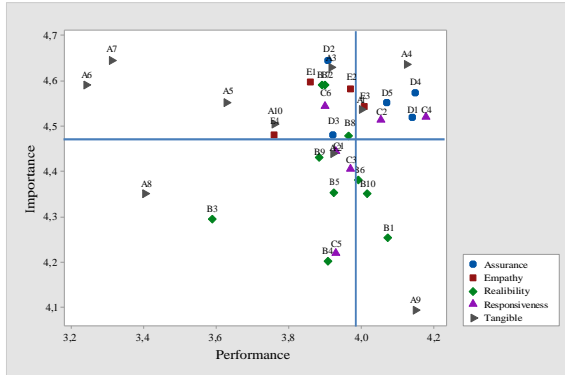


Figure 2. Importance - Performance Diagram of Mathematics Department Academic Services

The Mathematics Department should place improvement priority on the attributes that are in the B quadrant, which is a quadrant with a high level of importance but a low level of performance. From Figure 2, it can be seen that the attributes in this quadrant are :

- Collection of books and other references (A5);
- Internet availability and quality (A6);
- Availability of clean student toilets (A7);
- Availability of lecture system manuals (A10);
- The suitability of the material being tested and what is being taught(B7);
- equal treatment and attention from lecturers to students(E1), and
- support for students in developing achievements according to their interests and talents (E4).

In addition, the Mathematics Department must maintain the quality of academic services for attributes that are in quadrant A (keep up good work quadrant). Attributes in this quadrant are attributes that are considered more important and have good performance, which can be seen in Figure 2, i.e : cleanliness of the lecture hall, laboratories, reading room, etc (A1), availability of learning facilities (A3) dan computer facilities (A4), availability of teaching materials (B2), objectivity and tranparancy in grading (B8), assistance in the process of obtaining scholarships (C2), warning and attention for students who are threatened with dropping out (C4), efficient Study Plan Card filling process(C6), all assurance attributes, assistance to students who experience problems in understanding lecture material(E2), and academic advisor's attention (E3).

Other attributes are the ones with low priority and are even considered by students to be overworked

because these attributes are considered not so important as others in quadrant A and B.

4. CONCLUSION

The questionnaire is valid and reliable to be used in measuring student's expectation regarding the five dimensions of academic services and student satisfaction related to these. The index of student satisfaction is 77.89%, which means that students are satisfied with the academic service. Attributes that need to be prioritized for improvement are : collection of books and other references in library, internet availability and quality, availability of clean student toilets, availability of lecture system manuals, the suitability of the material being tested and what is being taught, equal treatment and attention from lecturers to students, and support for students in developing achievements according to their interests and talents.

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