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Strengthening Laboratory Services through User Satisfaction Analysis in Pre-service Teacher Education Program

Lutfiyah Hidayati*, Soeparno, Mita Yuniati

Universitas Negeri Surabaya
*Corresponding author. Email: lutfiyahhidayati@unesa.ac.id

ABSTRACT

The laboratory is the main facility for training students in terms of skills through practice, observation, research, and scientific development, by optimizing the use of available equipment and machines. The purpose of this study was to determine the level of service satisfaction received by laboratory users through measuring user's expectation and perception. Data collection with the SERVQUAL model and its dimensions namely tangibility, reliability, assurance, responsiveness and empathy. The research was conducted in the laboratory of clothing production in fashion education study program Universitas Negeri Surabaya. Involve 238 laboratory user as respondent. The data collection method uses an online questionnaire and a quantitative data processing method according to the application of the SERVQUAL method. The results showed that the average value of the gap score for each dimension was tangibility - 1,08, assurance -0,90, responsiveness -0,74, reliability -0,68 and empathy -0,30. There are five aspect with the highest gap score: equipment is modern, complete and in good condition (gap score -1,69), facilities are visually appealing (gap score -1,61), information from Laboratory resources meet users course needs (gap score -1,34), Assuring users of the accuracy and confidentiality of their personal information (gap score -1,21), and Dependability in handling users service problems (gap score -1,19). The five aspects need to be followed up immediately to improve their quality.

Keywords: *Laboratory services, User satisfaction, Pre-service teacher education.*

1. INTRODUCTION

The Assurance availability of quality services in higher education is very important. Students are the main customer, so every university must find its own way to provide quality services that differentiate it from its competitors. In addition to increasing the quantity of students while at the same time making quality sustainable. The quality of higher education is the main prerequisite for the continuity of industrial, economic and social development [1]. An indicator of the quality of a university is how well the service can be provided, and meets the level of satisfaction of students as the main customer [2]. Service quality is the main requirement for all successful institutions to remain competitive [3]. Experts have emphasized the importance of institutional managers to take initiatives to improve quality in order to produce sustainable competitive advantages [4-6]. It is not easy for universities to develop and maintain competitive advantage in their respective target markets [7]. In addition, due to the increasing level of domestic and international competition and customer demand, educational institutions have been looking for ways to gain different advantages [8].

Measuring the quality level of a higher education service is increasingly important for maintaining tuition-based income. However, the quality of higher education services has been neglected [9]. Excellent service quality increases customer satisfaction. Students seek higher education that provides better quality of service and convenience [10], thus influencing student loyalty [11]. Student satisfaction needs to be maximized with a strategy of providing high quality services [12]. Satisfaction is loyalty because the value is paid [13]. Overpromising and underdelivering service makes customers more dissatisfied, whereas better service at a lower price makes them more satisfied. In addition, student satisfaction is generally not identified with objections; however, just because buyers don't complain doesn't mean they are satisfied [14]. Students who are very satisfied will be more loyal to their institutions and

spread positive comments and recommend these institutions to others [15]

In the university context, service quality is not only limited to the teaching competence of professors but also the quality of institutional facilities. One of these services is a learning laboratory facility, as a practical and valid supporting application of theoretical learning carried out in the classroom [16]. Instructional laboratories have not received much attention for decades [17]. A study on the effective management of computer laboratories at universities shows that respondents agree that a conducive learning environment will increase their learning motivation. Students are the main customers in the education sector, and their perceptions and expectations of quality laboratory services, are very important in providing excellence in the learning process [18].

The conceptual foundation of the SERVQUAL model was first published in 1985 [19]. These measurements are divided into 5 dimensions, namely tangibility, reliability, responsiveness, assurance and empathy. Tangible includes a description of physical facilities, equipment, and appearance of personnel. Reliability includes a description of ability to perform the promised service dependably and accurately. Responsiveness includes a description of willingness to help customers and provide prompt service. Assurance includes a description of knowledge and courtesy of employees and their ability to inspire trust and confidence; and Empathy includes a description of caring, individualized attention the firm provides its customers [20].

Universitas Negeri Surabaya as a higher education institution, has gone through a series of transformations since its establishment in 1964. For more than 50 years of its existence, it currently has nine (9) faculties. In particular, this research is used in the instructional laboratory in the fashion education study program, one of the study programs in the faculty of engineering. As a scientific group based on social humanities, this is one of the unique and quite long history of its existence within the faculty of engineering. This study programs produce prospective vocational teachers according to the field of fashion education. One of the laboratories that plays an important role in this study program is the clothing production laboratory. This laboratory facilitates students in the process of producing individual and mass-production clothing. The role of the instructional laboratory in this study program is very important in facilitating practical activities as a companion to theoretical learning while at the same time producing competent graduates. These considerations were chosen at the same time as the limitations of the discussion of this paper.

2. METHOD

SERVQUAL is one approach to measuring service quality through measuring the gap. This gap is measured between customer expectations and perceptions as seen on figure 1 [21].

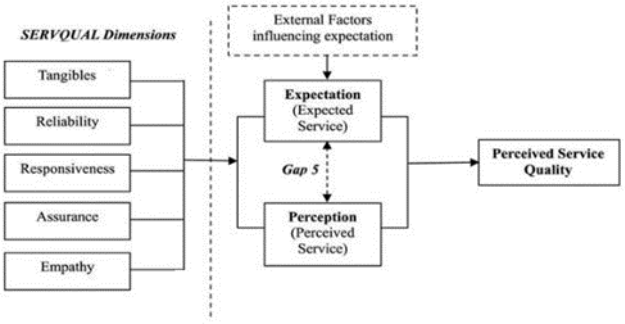

Figure 1. SERVQUAL Model [22]

This study involved 238 respondents who used clothing production laboratories. The survey was created on the internet with the help of Google Forms survey tool to collect primary data, and was adapted from [16] as the measurement tool for clothing production laboratory service quality. It is recommended a five-point Likert scale, ranged from "strongly agree" (5 point) to "strongly disagree" (1 point), when collecting customer feedback about expectations and perceptions of the services across the battery of service attributes [22]. Quantitative data were analysed using descriptive statistical analysis using the Statistical Package for Social Science (SPSS) 18.0and Microsoft Excel software.

3. RESULT AND DISCUSSION

3. 1. Tangibility Dimension

The results of the questionnaire data processing are presented coherently from the dimensions of tangibility, reliability, responsiveness, assurance, and empathy. Table 1 describes the tangibility dimension data including the expectations and perceptions of users of the clothing production laboratory and their gap scores. Here it is described in 4 aspects, namely (1) Equipment is modern, complete and in good condition, (2) Facilities are visually appealing, (3) Equipment, materials, tools, and consumables are well organized, and (4) Laboratories physical environment is clean, neat and untidy.

Table 1 illustrates 4 aspects under tangibility have a mean expectation score above 4 from tme maximum score 5 in likert scale. The mean of laboratory user's expectation score of tangibility was between 4.34 and 4.38 with the standard deviation between 0.64 and 0.74. The standard deviation poin indicate how the attribute scores were spread away from their respective mean values. This data indicates that some users of laboratory expect the clothing production laboratory to have well

managed offices while some do not really emphasise this attribute. An expectation above 4 is considered very high; therefore, laboratory users have a very high expectation regarding the dimension of tangibility. The mean customer perception score on tangibility was between 2,65 and 4,02 with the standard deviation between 0.84 and 0.86. This means that laboratory users have a slightly moderate perception; their perception is rather low especially on Ta-1 (condition of equipment) and Ta-2 (the facilities appeal) and it is high enough on Ta-3 (equipment organization) and also Ta-4 (Laboratories physical environment).

Table 1. Result of SERVQUAL Score for Tangibility Dimension

Code	Tangibility Description	Expectation Score (E)		Perception Score (P)		Gap Score
		MEAN	SD	MEAN	SD	(P-E)
Ta1	Equipment is modern, complete and in good condition	4.34	0.73	2.65	0.85	-1.69
Ta2	Facilities are visually appealing	4.35	0.74	2.74	0.86	-1.61
Ta3	Equipment, materials, tools, and consumables are good organize	4.36	0.70	3.72	0.84	-0.64
Ta4	Laboratories physical environment is clean, neat and untidy	4.38	0.64	4.02	0.84	-0.36

Regarding all four statements on tangibility, it can be observed that the mean of expectation scores was greater than the mean of perception scores for all items within the tangibility dimension. The score gap between user expectations and perceptions in the tangibility of the clothing production laboratory shows that for the Laboratories physical environment aspect with a gap of -0.36 indicates that the user's perception has almost reached his expectations or in other words satisfaction in this aspect is quite high. Likewise in the aspect of organizing equipment, materials, tools, and consumables with a gap score of -0.64, it means that the user's perception is not too far from his expectations. Whereas in the aspect of appealing visual facilities with a gap score of -1,61, even in the aspect of modernity, completeness and condition of laboratory facilities with the highest gap score of -1.69, this shows user satisfaction at a moderate level. This user assessment indicates that the university should pay attention and improve facilities in these two aspects better.

3.2. Reliability Dimension

The result of the second-dimension reliability illustrated in table 2.

Table 2. Result of SERVQUAL Score for Reliability Dimension

Code	Reliability Description	Expectation Score (E)		Perception Score (P)		Gap Score
		MEAN	SD	MEAN	SD	(P-E)
Re1	Dependability in handling users service problems	4.20	0.65	3.01	0.82	-1.19
Re2	Technical Assistant provide services accuratelywith minimum interruption	4.14	0.66	3.65	0.82	-0.49
Re3	Technical Assistant provide services as promised	4.14	0.68	4.05	0.83	-0,09
Re4	Providing services at the promised time	4.38	0.64	3.44	0,76	-0.94

Table 2 illustrates all 4 aspects under reliability also have a mean expectation score above 4. The mean of laboratory user's expectation score of reliability was between 4.14 and 4.38 with the standard deviation between 0.64 and 0.68. This data indicates that some users of laboratory expect the clothing production laboratory to have well managed offices while some do not really emphasize this attribute. An expectation above 4 is considered very high; therefore, laboratory users have a very high expectation regarding the dimension of reliability. The mean customer perception score on reliability was between 3,01 and 4,05 with the standard deviation between 0.76 and 0.83. This means that laboratory users have a slightly moderate until high perception in reliability dimension sequentially from the lowest to the highest, namely Dependability in handling users service problems as the lowest perception aspect, and then providing services at the promised time, Technical Assistant provide services accurately with minimum interruption and the highest perception is Technical Assistant provide services as promised.

Regarding all four statements on reliability, it can be observed that the mean of expectation scores was greater than the mean of perception scores for all items within the reliability dimension. The score gap between user expectations and perceptions in the reliability of the clothing production laboratory shows that for the Technical Assistant provide services as promised aspect with a gap of -0.09 indicates that the user's perception has almost reached his expectations or in other words satisfaction in this aspect is quite high. Likewise in the aspect of Technical Assistant provide services accurately with minimum interruption with a gap score of -0.49 and also in the aspect of providing services at the promised time with a gap score of -0.94, it means that the user's perception is not too far from his expectations. Whereas in the aspect of Dependability in handling users service problems with a gap score of - 1,19, this shows user satisfaction at a moderate level.

3.3. Responsiveness Dimension

The result of the third dimension: responsiveness illustrated in table 3.

Table 3 illustrates all 4 aspects under responsiveness also have a mean expectation score above 4. The mean of laboratory user's expectation score of responsiveness was between 4.31 and 4.38 with the standard deviation between 0.67 and 0.68. This data indicates that some users of laboratory expect the clothing production laboratory to have well managed offices while some do not really emphasise this attribute. An expectation above

4 is considered very high; therefore, laboratory users have a very high expectation regarding the dimension of responsiveness. The mean of laboratory user's perception score on responsiveness was between 3,48 and 3,81 with the standard deviation between 0.83 and 0.87. This means that laboratory users have high perception in responsiveness dimension, sequentially from the lowest to the highest are Technical Assistant serve promptly to the users as the lowest perception aspect with the mean P-score 3,48, and then Technical Assistant have willingness to help user the mean P-score 3,55.

Table 3. Result of SERVQUAL Score for Responsiveness Dimension

Code	Responsiveness Description	Expectation Score (E)		Perception Score (P)		Gap Score
		MEAN	SD	MEAN	SD	(P-E)
Res1	Technical Assistant have willingness to help user	4.31	0.67	3.55	0.83	-0,76
Res2	Technical Assistant keep users informed about when services will be perform	4.38	0.68	3.65	0.85	-0,73
Res3	Technical Assistant serve promptly to the users	4.35	0.67	3.48	0.83	-0,87
Res4	Readiness to respond to user's questions	4.40	0.67	3,81	0.87	-0.59

Technical Assistant keep users informed about when services will be perform the mean P-score 3,65 and the highest perception is Readiness to respond to user's questions the mean P-score 3,81. Regarding all four statements on responsiveness, it can be observed that the mean of expectation scores were greater than the mean of perception scores for all items within the responsiveness dimension. The all score gap between user expectations and perceptions in the responsiveness of the clothing production laboratory is below the score -1, that is in the gap score ranged between -0.59 to - 0.87. It means that in responsiveness dimension the user's perception is not too far from their expectation, so this illustrates that user satisfaction at a high level.

3.4. Assurance Dimension

The result of the fourth dimension: Assurance illustrated in table 4.

Table 4. Result of SERVQUAL Score for Assurance Dimension

Code	Assurance Description	Expectation Score (E)		Perception Score (P)		Gap Score
		MEAN	SD	MEAN	SD	(P-E)
As1	Assuring users of the accuracy and confidentiality of their personal information	4.33	0.69	3.12	0.82	-1.21
As2	Information from Laboratory resources meetusers course needs	4.46	0.63	3.12	0.82	-1.34
As3	Technical Assistant are always courteous	4.33	0.71	4.12	0.80	-0.21
As4	Technical Assistant are knowledgeable toanswer users query	4.31	0.72	3.46	0.88	-0.85

Table 4 once more illustrates all 4 aspects under assurance have a mean expectation score above 4. The mean of laboratory user's expectation score of assurance was between 4.31 and 4.46 with the standard deviation between 0.63 and 0.72. This data indicates that some users of laboratory expect the clothing production laboratory to have well managed offices while some do not really emphasise this attribute. An expectation above 4 is considered very high; therefore, laboratory users have a very high expectation regarding the dimension of assurance. The mean customer perception score on assurance was between 3,12 and 4,12 with the standard deviation between 0.80 and 0.88. This means that laboratory users have moderate to high perception. Regarding all four statements on assurance, it can be observed that the mean of expectation score were greater than the mean of perception scores for all items within the tangibility dimension. The score gap between user expectations and perceptions in the assurance of the clothing production laboratory shows that for the aspect of Technical Assistant are always courteous with a gap. Table 5 illustrates 5 aspects under empathy also have a mean expectation score above 4. The mean of laboratory user's expectation score of responsiveness was between 4.11 and 4.59 with the standard deviation between 0.67 and 0.70. This data indicates that some users of laboratory expect the clothing production laboratory to of -0.21 indicates that the user's perception has almost reached his expectations or in other words satisfaction in this aspect is quite high. Likewise in the aspect of Technical Assistant are knowledgeable to answer users query with a gap score of -0.85, it means that the user's perception is not too far from his expectations. Whereas in the aspect of Assuring users of the accuracy and confidentiality of their personal information with a gap score of -1,21, even in the aspect of Information from Laboratory resources meet users course needs with the gap score of -1.34, this shows user satisfaction at a moderate level. This user assessment indicates that the university should pay attention and improve the laboratory service in these two aspects better

3.5. Empathy Dimension

The result of the fifth dimension: empathy illustrated in table 5. have well managed offices while some do not really emphasise this attribute. An expectation above 4 is considered high until very high; therefore, laboratory users have a very high expectation regarding the dimension of empathy. The mean of laboratory user's perception score on empathy was between 3,75 and 4,09 with the standard deviation between 0.79 and 0.88. This means that laboratory users have high and very high perception in empathy dimension, sequentially from the lowest to the highest: Technical Assistant give individual attention to the users as the lowest among the other 5 aspects with the mean P-score 3,75, and then Technical Assistant have willingness to help user the mean P-score 3,55, the aspect of Giving priority to the users interests

with the P-score mean 3,85, the aspect of Convenient opening hours (closing and opening hours) or time allotment is enough with the P score mean 4,01 and the highest perception is the aspect of Technical Assistant understand the needs of the users with the P-score mean 4,09. Regarding all four statements on empathy, it can be observed that the mean of expectation scores was greater than the mean of perception scores for all items within the perception score among the other 4 dimensions, is still quite good with that score which is above point 3. responsiveness dimension. The all score gap between user expectations and perceptions in the responsiveness of the clothing production laboratory is below the score -1, that is in the gap score ranged between -0.17 to - 0.58. It means that in empathy dimension the user's perception is close to the same score and not too far from their expectation, so this illustrates that user satisfaction at a high level.

Table 5. Result of SERVQUAL Score for Empathy Dimension

Code	Empathy Description	Expectation Score(E)		Perception Score (P)		Gap Score (P-E)
		MEAN	SD	MEAN	SD	
Em1	Convenient opening hours (closing and openinghours) or time allotment is enough	4.59	0.70	4.01	0.79	-0.58
Em2	Giving priority to the users interests	4.14	0.68	3.85	0.87	-0.29
Em3	Technical Assistant give individual attention to the users	4.12	0.67	3.75	0.80	-0,37
Em4	Technical Assistant understand the needs of the users	4.17	0.68	4.09	0.88	-0.18
Em5	Technical Assistant who deals with users in aconcerned or considerate manner	4.11	0.69	3.94	0.79	-0.17

3.6. Average Mean-Score of Laboratory User's Expectation and Perception

Table 6 illustrates the average expected score of laboratory users from the 5 dimensions, the highest being tangibility, responsiveness and assurance with an average expected score of 4.36. Followed by empathy with an average expected score of 4.23 and the lowest among others is reliability dimension with an expected score of 4.21. The range of mean scores between 4.36 and 4.21 is only 0.15, not too much difference. This means that the expectations of laboratory users are very high. On the other hand, the average laboratory user perception score is included in the moderate to high category. The highest average score is in the empathy dimension (average P-score 3.93), followed by Responsiveness (average P-score 3.62), then reliability (average P-score 3.54), then assurance (mean P-score 3, 46), and the lowest tangibility (mean P-score 3.28). Tangibility as a dimension that achieves the lowest average score can be presented in table 6. But even so, this is important information as part of the complaints submitted by laboratory users, as a means for institution manager to improve learning services for students. Judging from the gap scores of the 5 dimensions of laboratory services, sequentially from the largest to the smallest the gap scores are tangibility (gap score -1.08), assurance (gap score -0.90), responsiveness (gap score - 0 .74), reliability (gap score -0.68), empathy (gap score - 0.30). The gap score indicator shows that the fulfillment of customer satisfaction, in this case the students who use the clothing production laboratory in the highest rank is empathy. This means that laboratory users are very satisfied with the 4 aspects related to the empathy dimension, namely Technical Assistants who deals with users in a concerned or considerate manner, Technical Assistants understand the needs of the users, giving priority to the users' interests, Technical Assistants give individual attention to the users, and Convenient opening hours (closing and opening hours) or time allotment is sufficient. Table 6 once more shows the average value of the total gap score from the 5 dimensions, which is -0.74, below point -1. This indicates that in general the gap between the perceptions and expectations of fashion production laboratory users is at a low level Furthermore, if analyzed from the achievement of gap scores for each aspect of the 5 dimensions, there are 5 aspects including 2 aspects of the tangibility dimension, 2 aspects of the assurance dimension and 1 aspect of the reliability dimension, as shown in table 7. Using the five dimensions of the SERVQUAL model. The finding proved that service quality and its dimensions include: tangibility, reliability, assurance, responsiveness and empathy, had an impact on user satisfaction. This study would assist managers of the fashion education study programs at Unesa alike to increase their attention of students as main customers' expectations and perceptions on the dimensions of service quality. This would enable the institution to explore the weakest dimension and distribute resources accordingly in the service areas in order to minimize the gap that existed between users' expectations and institutional services.

Table 6. Average Mean-Score of Laboratory User's Expectation and Perception

Dimension	Expectation Score(E)		Perception Score(P)		Gap Score (P-E)
	MEAN	SD	MEAN	SD	
Tangibility	4.36	0.70	3.28	0.90	-1,08
Reliability	4.21	0.65	3.54	0.89	-0,68
Responsiveness	4.36	0.67	3.62	0.85	-0,74
Assurance	4.36	0.69	3.46	0.88	-0,90
Empathy	4.23	0.69	3.93	0.82	-0,30
Overall Service Quality Score	4.30	0.66	3.57	0.87	-0,74

As a limitation of this study that not all service quality attributes or dimensions are as important as customer satisfaction. This study also cannot establish a statistically significant level of the effect of service quality on customer satisfaction because it does not test any hypotheses and does an analysis to produce a model

of the relationship between the five dimensions of service quality and customer satisfaction.

Table 7. The Highest Gap-Score of the dimension's Aspects

Code	Description	Ekspectation Score (E)	Perception Score (P)	Gap Score (P-E)
Ta1	Equipment is modern, complete and in good condition	4.34	2.65	-1.69
Ta2	Facilities are visually appealing	4.35	2.74	-1.61
As2	Information from Laboratory resources meet users course needs	4.46	3.12	-1.34
As1	Assuring users of the accuracy and confidentiality of their personal information	4.33	3.12	-1.21
Re1	Dependability in handling users service problems	4.20	3.01	-1.19

Based on the gap-score illustrated in table 7, there are five aspects that must be of concern to institutional managers. First, related to the increase in the procurement of modern equipment following the demands of scientific and technological developments as well as the progress of the fashion industry, as well as related to the completeness and condition of well-maintained equipment. Second, regarding the visual appeal of laboratory facilities. Third, related to the availability of sufficient information from Laboratory resources that must meet users' course needs. Fourth, related to the aspect of assuring users of the accuracy and confidentiality of their personal information and fifth, related to the aspect of dependability in handling user service problems. The five aspects above deserve proper treatment so that they can guarantee the satisfaction of laboratory users as the main consumers of education in the Unesa fashion education study program.

4. CONCLUSION

Assurance of the quality services at learning institution is very important to support the quality of graduates. The main objective of this study was to examine the impact of service quality dimensions. Nonetheless, to obtain which aspects need to be improved, it is necessary to further review more specifically in each section, especially those with a fairly high gap score.

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