Assessment of Service Quality at Higher Education Institutions Using the Integration of the Hiedqual Model and the Service Improvement Matrix

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Abstract
The Faculty of Engineering is the most prominent faculty at Diponegoro University. Urban and Regional Planning (URP) is one of the departments in the Faculty of Engineering that has high interest. To formulate an institutional development strategy, the URP Department regularly evaluates its services to measure its performance from the stakeholder side. This study aims to identify critical indicators that students consider so that corrective actions can be taken as part of continuous quality improvement. This study uses the HiEDQUAL model to measure the level of student expectations compared to the level of service performance that has been provided. While the method used is the Service Improvement Matrix (SIM). Respondents in this study were URP undergraduate students with a total of 250 students. Service quality is measured using gap analysis. The SIM matrix plots the gap value to determine the critical indicators located in the left quadrant. Recommendations for improvement are developed based on critical indicators.
Keywords: *Service Quality, HiEDQUAL Model, GAP Analysis, Service Improvement Matrix*

I. INTRODUCTION

In the context of higher education, a marketing strategy to examining students' views of service quality may improve service functions and attract and retain students. When making an uncertain and high-risk decision like picking an institution, students look for evidence of service excellence [1,2]. Therefore, it may not be advantageous for colleges in the higher education market to ignore the nature and relevance of service quality.

Higher education is purely a service that necessitates more interpersonal interaction. Because higher education is a service and students are expected to pay for their education, it seems reasonable that colleges move away from being product-led, that is, relying on the product to sell, and toward being more customer-led [1]. In educational literature, the customer-centric approach (or student-centric approach) to service quality has gained traction as the rising cost of education has generated a new generation of students who are more conscious than ever before [3]. In the context of higher education, this technique could potentially improve quality.

Given the move to a knowledge economy, education is a vital institution. Higher education institutions' students are becoming increasingly worried as customers as a result of the marketplace. Higher education has evolved into a worldwide industry, and universities must continue to look for ways to export their services [4]. Furthermore, in the education industry, where there are no actual products, the service supplied will serve as a competitive line between institutions regarding their superiority in providing unique experiences [5]. Universities are required to provide high-quality service while competing for results such as research and innovation. As a result, assessing the quality of service in higher education can provide valuable information and insights that will help management and staff continue to improve the quality of education [6].

Student satisfaction is the main focus in dealing with competitive pressures in the education service industry [7]. Therefore, student goals have become the most critical part of ensuring a sustainable competitive advantage in the education services industry. Furthermore, students who are fast on the quality of services provided will provide a launching advantage for universities. Indeed, service quality plays a strategic role in the competitive advantage of universities [8].

Diponegoro University is one of the public universities in Semarang, which has 11 faculties and two schools, namely vocational schools and graduate schools. The Faculty of Engineering is the most prominent

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faculty at Diponegoro University, which has 25 study programs, around 8000 students, 300 lecturers, and 200 education staff. The Bachelor Program in Urban and Regional Planning (URP) is one of the Study Programs at the Faculty of Engineering that continuously strives to improve the quality of its services. The current number of URP students is 661 active students from all batches. The interest of prospective students towards URP continues to increase from year to year. URP seeks to develop a study program development plan by referring to the performance assessment and service quality assessment that has been carried out. This research is an effort to assess service quality conducted by URP. This study uses a gap analysis approach and Service Improvement Matrix in processing student perception data on services at URP. The indicators of this study adopt the HiEDQUAL (High Education Quality) model. By listening to student input and then responding to their needs, URP hopes to consistently improve customer (student) satisfaction, service quality, and customer loyalty [9, 10]. Through increasing consumer satisfaction and loyalty, it is hoped that interest will increase and become a means of branding the URP study program.

II. LITERATURE REVIEW

2.1. Service quality in higher education

There is substantial literature on the causes and implications of quality education in higher education [11, 12]. Nonetheless, several studies have been conducted using general service quality models such as SERVQUAL, SERVPREF, and others to assess students' experiences with higher education service quality. The SERVQUAL instrument [13] has gotten the most attention among these models for measuring perceived quality in higher education [14]. The "SERVQUAL" instrument to quantify consumers' perceptions of service quality performance. In education, the SERVQUAL instrument has evolved into the most widely used service quality measurement instrument created by [13]. It includes 22 measures for assessing service quality across five dimensions: dependability, accessibility, tangibility, assurance, and responsiveness. SERVQUAL measures service quality by subtracting consumers' expectations from their perceptions of 22 different factors. The SERVQUAL instrument, while widely used and adapted in numerous service organizations, is not without criticism.

Reference [15] criticized SERVQUAL's framework, claiming that there is no evidence to support the concept of the "expectations minus perceptions" gap as a basis for assessing service quality, and offered SERVPREF, a "performance only" measure of service quality. The conceptual and operational challenges of utilizing the "expectations minus perceptions" method and proposes the Evaluated Performance (EP) instrument, which assesses the difference between perceived performance and the optimal amount of a feature rather than the customer's expectations [16].

There are real questions and ideas in the debate over the gaps between SERVQUAL [17] SERVPERF and Evaluated Performance (EP) ways to measuring service quality. Although SERVQUAL, SERVPERF, and EP were created as cross-industry standard measures of service quality, the consensus appears to be that the instruments should be viewed as a basic "framework" that must be modified to match the specific application or context. Undoubtedly, the use of these methodologies as a means of assessing service quality in the marketing (service) sectors has been tried and tested to some extent, but this may not be the case in other service sectors, such as higher education.

Other distinctive elements of the higher education sector and generic models present severe issues about developing an exclusive assessment instrument to evaluate service quality in higher education. Higher education is part of the service industry, and while it can help with generalizing service quality measures, it requires additional attention due to its complex nature. Higher education is difficult for scholars since it is a type of pure service [18] with a complicated combination of traits that constitute services: intangibility, inseparability, variability, perishability, simultaneity, and heterogeneity.

Another challenge in evaluating services is that customers' earlier experiences with a specific service sector strongly influence their expectations from another service provider, with competing services in the same industry, or with related services in different sectors [19]. Similarly, there are many difficulties in measuring service quality, and recent research has raised many concerns about the theory behind existing generic instruments for use in higher education [20]. Similarly, an examination of the literature reveals numerous points of contention in the argument over how to quantify service quality.

As a result of this analysis, it is clear that evaluating service quality in the higher education sector is a challenging endeavor that necessitates a thorough understanding of both conceptual and empirical concerns. Therefore, instead of continuing the evaluation under the shadow of a standard measurement scale applicable to a wide range of services, it is critical to construct an instrument specifically developed for evaluating service quality in higher education.

2.2. Service quality in higher education models

Mapping of service quality in higher education models has been carried out by [21] and is described as follows. Several SQ models have been established in response to the need for SQ models in higher education, such as HEdPERF, developed by [22], and HiEdQUAL developed by [23]. When compared to SERVPERF, [20] discovered that HEdPERF had greater validity and reliability scores. A study in higher education on five SQ scales. SERVQUAL, weighted SERVQUAL, SERVPERF, weighted SERVPERF, and HEdPERF are the five scales used in the study conducted by [24]. The five scales were determined to have excellent measurement capabilities. The most significant marks were given to SERVPERF, which includes reliability, assurance, tangibles, empathy, and responsiveness, and HEdPERF, which includes academic aspects, non-academic elements, reputation, access, and program concerns [20]. When comparing the dimensions of the two scales, it is discovered that HEdPERF contains elements that are more relevant and applicable to higher education institutions than SERVPERF. The HiEdQUAL scale in the HE context, based on HEdPERF created and tested by [23].

Administrative elements, academic aspects, support services, campus infrastructure, and academic facilities are the five dimensions of the HiEdQUAL scale. Context-specific constructs were used in subsequent investigations in higher education. Academic, administrative, and facilities are the three dimensions of SQ, according to [25]. The authors found that marketing communication to students is an essential antecedent of perceived SQ. HEI SQ in Malaysia using seven dimensions: administrative service, tangibles, academic programs, academic staff, delivery of teaching, assurance, and empathy of academic staff measured by [26].

The HEDQUAL scale was designed and validated by [27] to assess service quality among MBA students in higher education. The model is made up of five dimensions: Academic excellence, administrative excellence, library excellence, supportive services excellence, and career opportunities excellence. A model of SQ that included five different dimensions: administrative quality, physical environment quality, core educational quality, support facilities quality, and transformational quality created and evaluated by [28]. Unfortunately, in higher education, there is no unanimity on SQ dimensions. However, multiple studies reveal that SQ has gotten much attention.

With the proliferation of SQ models highlighted, HiEdQUAL may be argued to have multiple advantages as a model for assessing SQ in higher education institutions for a variety of reasons: (1) HiEdQUAL's five dimensions represent the many services that students encounter within a higher education institution. As a result, it is considered descriptive of received services and industry-specific; (2) HiEdQUAL demonstrated high reliability when developed and tested, with a Cronbach alpha of 0.90 [23]; and (3) each dimension in HiEdQUAL groups items together to represent a specific functional area within a higher education institution. The identification and measurement of perceived SQ for each functional area are made more accessible with this grouping. Students' perceptions of academic service quality may, for example, be distinguished and tested separately from students' perceptions of support or non-academic service quality. As a result, the HiEdQUAL framework may give accountability for various functional areas and identify perceived strengths and areas for growth from a functional standpoint. In light of the preceding debate, it is vital to isolate different services supplied to students while re-examining SQ dimensions rather than seeing multiple educational services holistically.

When looking at the HiEdQUAL model's dimensions, it is clear that they include a variety of value creators in a typical higher education institution, including academicians in academic aspects, administrators in administrative aspects, IT staff in support services, and librarians in academic facilities, among others. The inclusion of different value creators is aligned with the value co-creation premise in [29, 30], Service-Dominant Logic paradigm (SDL), which other scholars later used [31, 32, 33, 34, 35] as a paradigm shift in service marketing theory. All value providers in an HEI, such as educators, IT personnel, administrators, and librarians, must work together to create value. As a result, HiEdQUAL accounts for all value generators within a higher education institution except for students. From this point on, it is vital to regard students as co-creators of quality and as integral parts of the learning process, so students' service role is suggested as an element of assessing SQ in the HiEdQUAL.

The service role of students in co-creating SQ is supported by both higher education literature and service marketing theory. Several researchers in higher education see students as partners, emphasizing students' participation in the educational process and treating them as co-producers of education [36, 37, 38]. Students contribute to developing their own and other students' service experiences by gaining knowledge, interacting and building relationships with coworkers and friends [39], and participating in class discussions and other learning activities such as research and group presentations. [29] proposed the Service-Dominant Logic paradigm (SDL), which considers service recipients as co-creators of value, by [40], who claim that service users co-produce the services they consume. The writers went on to say that the value of services, including educational services, would be restricted if service consumers, who in this case are students, were not fully involved.

Students' self-regulation and autonomy are cited in the literature as essential components of student-centered learning in higher education [41]. The ability of students to impact their learning paths and the environment, according to the author, is a critical component of student-centered learning. Active learning practices can improve students' involvement in learning as part of a student-centered environment [42]. Autonomy, self-regulation, a student-centered learning environment, and active learning are examples of students' active participation in and co-production of their learning experience. Students are thus resources and value co-creators in the current research, playing an active role in the co-production of their own and other students' educational experiences. Students can be regarded as perceived SQ elements because they are viewed as co-creators of service/educational value. Qualitative research is required to substantiate students' role as a value co-creation resource and highlight how students may influence other students' service experiences.

2.3. Developing of Conceptual Model
2.3.1. Development of Research Instrument

The 27 separate statements for inclusion in the draft questionnaire were generated using in-depth literature research. [23] introduced a new measurement instrument for service quality in the context of higher education called HiEDQUAL (High Education QUALity). HiEDQUAL's new service quality measurement model was developed based on the student's point of view. [23] have conducted an empirical study measuring the quality of higher education services. The results of his study show that the HiEDQUAL (High Education QUALity) service quality model, consists of five dimensions that determine service quality from various service aspects, namely teaching and course content; administrative service; academic facilities, campus infrastructure; and support service. In addition, the model considers academic and non-academic aspects of the entire student experience, namely:

a) Teaching and Course Content. This aspect consists of the quality of lecturers in the learning process, curriculum, lecture program units, lecture content, information about academics, study program staff, the relevance of lectures and syllabus.
b) Administrative Services. This aspect describes the service of administrative staff in serving students.
c) Academic Facilities. This aspect describes the facilities and infrastructure in the learning process.
d) Campus Infrastructure. This factor includes the facilities provided by the university.
e) Support Services. This aspect includes supporting facilities.

The research indicators were built referring to [23] and are presented in Table 1.

Table 1 Indicators of HiedQual

No	Code	Indicators	Operational Definitions
Teaching and Course Content			
1	TC1	Teachers responsive and Accessible	Lecturers are responsive/respond well to students and are easy to contact.
2	TC2	Teachers follow Curriculum strictly	Lecturers provide lecture materials according to the curriculum
3	TC3	Teachers follow good Teaching Practices	Lecturer teaches well
4	TC4	Relevance b/w Program and Syllabus	The syllabus used follows the RPS that has been prepared
5	TC5	Course Content Develops students' Knowledge	Lecture content develops student knowledge
6	TC6	Department Informs schedules, exams, results etc.	The department informs the schedule, exams, results, and others related
7	TC7	Teachers Complete Syllabus on time	Lecturers teach courses on time
8	TC8	Department. has Sufficient Academic Staff	The department has sufficient academic staff
Administrative Service			
9	AS1	Administrative Staff Provide Service without delay	Administration staff provide service without delay
10	AS2	Administrative Staff are courteous and Willing to help	Administration staff are polite and willing to help
11	AS3	Administrative Staff Provide Error free work	Administration staff does the job without error
12	AS4	Administration maintains accurate and Retrieval Records	Administration takes and enters data appropriately
13	AS5	Administrative staff accessible during office hours	Administrative staff can be found during business hours
14	AS6	University has safety and security measures	The department has safety and security measures
Academic Facilities			
15	AF1	Department has adequate facilities	The department has adequate facilities
16	AF2	Classrooms equipped with teaching aids	Classrooms are equipped with teaching aids (such as LCD, whiteboard, etc.)
17	AF3	Department has sufficient class rooms	The department has enough classrooms
18	AF4	University has adequate auditoriums, conference halls etc.	The department has adequate space to hold meetings, seminars, and others
19	AF5	Library has adequate academic resources	Libraries have adequate academic resources
20	AF6	Computer labs have adequate equipment and internet facilities	The computer laboratory has adequate internet facilities and equipment
Campus Infrastructure			
21	CI1	University has adequate hostel facilities	The university has adequate dormitory facilities

22	CI2	University has adequate medical facilities (Health Centers)	University has adequate medical facilities (Health Center)
23	CI3	University has adequate Amenities (Canteen, Shopping Centre, Bank, ATM, Post office, etc.)	The university has adequate facilities (canteen, shopping center, bank, ATM, post office, etc.)
24	CI4	Campus infrastructure is well maintained.	The campus infrastructure is well maintained.
Support Service			
25	SS1	University has sufficient sports and recreation facilities.	The university has sufficient sports venues and recreational facilities or open green spaces
26	SS2	University/department provides placement services	The department has student association services
27	SS3	University provides counseling services	The university provides counseling or complaint services

2.3.2. The Conceptual Model

The HiEDQUAL (High Education QUALity) service quality model has five dimensions that measure service quality based on numerous service components, including lecture and teaching and course content; administrative service; academic facilities, campus infrastructure; and support service [23]. The research's conceptual model is formulated as follows, based on part 2.3.1.
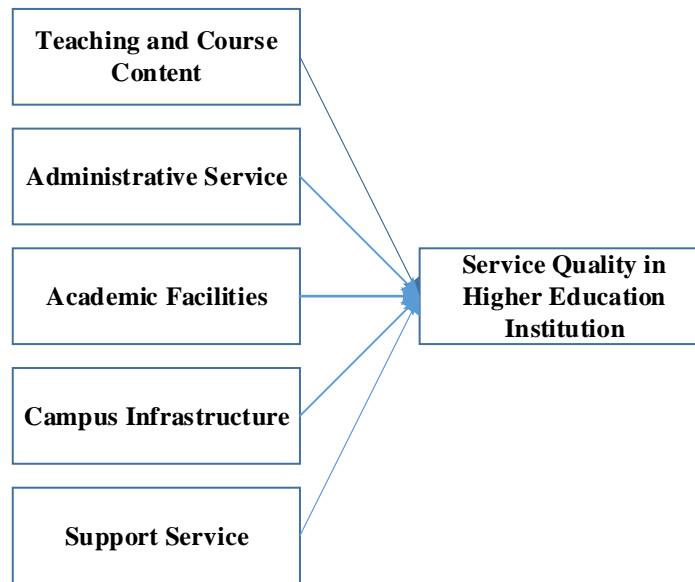

Figure 1 Conceptual Model

III. RESEARCH METHODS

3.1. Research Methods

This research aims to assess the service quality of higher education institutions, namely the URP Department. Check for service gaps in individual service quality aspects using gap analysis. A survey of URP Department students was used as the research approach. The target group was decided to be 270 students who represented the URP Department's student population as respondents. A sample size of thirty to five hundred people is considered an adequate sample size as a rule of thumb [43]. Purposive sampling is used, with the distribution concentration focusing primarily on second, third, and fourth-year students because they have more experience with university services. The research tool used is HiedQual based on [23]. In terms of data analysis, the [17] service quality gap model was used to determine the level of student expectation and perception. The Service Improvement Matrix (SIM) framework suggested in this study was a practical framework for generating an importance-performance matrix to quantify perception (student satisfaction) and expectation (importance). Satisfaction based on service perceptions and interests based on service expectations is plotted on a two-dimensional grid using a service improvement matrix (SIM). This enables service improvement decisions, such as service upgrades required and essential to students (low satisfaction rating) (high importance rating). Head of the study program are given service techniques to improve service quality and increase student satisfaction.

3.2. Survey

Data was collected using a nonprobability judgmental sampling technique from senior students who had completed at least one year of university education in November 2020 to conduct an empirical study. A total of 259 questionnaires were returned and deemed valid, with a response rate of 92.1 percent.

IV. RESULT AND DISCUSSION

4.1. Questionnaire Validity Test

A validity test is used to determine the validity of the questionnaire or questionnaire in collecting research data. An instrument is valid if it can measure what is to be measured. In this study, validity testing was carried out using Bivariate Person correlation (Pearson Moment Product) and Corrected item-total Correlation, with a 95% confidence level and an accuracy level (α) of 5%. From the analysis results, it is known that all values of r-count are greater than r-table mean that all items for the assessment of expectations and reality are declared valid.

4.2. Questionnaire Reliability Test

A reliability test is used to determine whether the measuring instrument used is reliable and remains consistent if the measurement is repeated. In this study, the reliability of the questionnaire was tested using the Cronbach's Alpha method. The question item is reliable if the Cronbach's Alpha value is greater than the r-table. Testing the reliability of the questionnaire was carried out on each part of the questionnaire. It is known that the value of Cronbach's Alpha of the question items on the assessment of the expectation level is 0.9. This value is compared with the r-table value (N=259, α = 5%) which is 0.6. The conclusion is Cronbach's Alpha = 0.9 greater than r-table = 0.6 means reliable. The correlation is in the powerful category. While the value of Cronbach's Alpha for items in the real assessment is 0.94. This value is compared with the value of r-table (N = 259, α = 5%) which is 0.6. The conclusion is that Cronbach's Alpha = 0.94 is greater than r-table = 0.6 meaning reliable. The correlation is in the powerful category.

4.3. Gap Analysis

The Wilcoxon aims to test whether there is a gap between expectations and reality in the items analyzed. The test is done by distinguishing the value between the level of expectation and the level of performance. These differences occur in the same sample group, namely the same customers, filling out the same questionnaire. The Wilcoxon test is applied to non-parametric data, such as data that are not normally distributed. The Wilcoxon test in this study used a significant level (α) = 0.05. If the significance (Sig) < α, the conclusion is that there is a lot between reality and customer expectations. From the results of data processing, a significance result (Sig) of 0.000, because the value of sig < (0.000 <0.05) is obtained, the conclusion shows that there is a statistically significant indicator between expectations and service performance received.

After the Wilcoxon test, the next step is to conduct a gap analysis of the indicators for assessing higher education service quality at the URP Department using the Gap Analysis method. In this study, gap analysis is a study made to identify whether the existing service system at Higher Education Institutions (HEIs) is appropriate or able to meet customer needs or not. This analysis process is usually carried out to determine what strategies or steps must be taken to move from an unfavorable current condition to the desired condition in the future. When there is a gap in HEIs, gap analysis acts as an evaluation tool that focuses on the performance gap of HEIs.

4.4. Data Processing

The demographic profile of the respondents revealed that 52 percent of the respondents were female, and the majority of the respondents had worked for student organizations (84 percent). In terms of age, 42 percent of respondents are under the age of 20, and 58 percent are between 21 and 24. In addition, 19 percent of students are enrolled in the first and second semesters, while 30 percent are enrolled in the third and fourth semesters, and another 51 percent are enrolled in the fifth to eighth semesters.

Based on data processing, for the student perception category, the dimensions of Academic Facilities (M = 5.36, SD = 0.59) received the highest score, followed by Teaching and Course Content (M = 5.30, SD = 0.35), Support Service (M = 5.11, SD = 0.74), and Administrative Service (M = 5.02, SD = 0.17), with the Campus Infrastructure dimension receiving the lowest score (M = 4.95, SD = 0.40). Meanwhile, for student expectation category, Academic Facilities has the highest average overall score (M = 6.67, SD = 0.04), followed by Support Service (M = 6.60, SD = 0.07), Administrative Service (M = 6.46, SD = 0.10), and Campus Infrastructure (M = 6.44, SD = 0.13), and Teaching and Course Content has the lowest average overall score (M = 6.42, SD = 0.13).

The disparity between the expected and perceived service quality is then investigated using gap analysis. The findings demonstrate that all five HiedQual variables for student perceptions have lower ratings than expected, implying that significant service improvement initiatives are required in higher education. With a gap score of -1.50, the Support Service dimension has the most significant disparity. The gap scores for all items ranged from -0.71 to -1.97 in general. With a gap score of -1.97, University provides counseling services received the highest score. Meanwhile, the Campus Infrastructure dimension has a gap score of -1.49, and the item Campus infrastructure is well maintained has a gap score of -2.07. The Administrative Service dimension

has a gap score of -1.44, with the item University has safety and security measures having the highest gap score of -1.74. The Academic Facilities dimension has an overall gap score of –1.30, with the item Department has sufficient classrooms having the most significant gap of -2.07. Finally, the Teaching and Course Content dimension came in second with a -1.12 total gap score, with the item Teachers Responsive and Accessible having the most significant gap of -1.78. Thus, there is evidence that there is a gap between perceptions and expectations of students in the URP Department on the five service aspects.

Based on this gap, the URP Department developed a strategy for improvement in all aspects of service. In terms of human resources, both lecturers and education staff, the Head of the Department will submit complaints and student complaints at the Department meeting and discuss improvements that each Lecturer and Education Personnel should make. Regarding aspects of physical facilities and infrastructure, the Department will coordinate with the Faculty of Engineering to improve the following year's budget plan for procurement or repair of facilities. In terms of the curriculum (both curriculum structure and course content) and the implementation of the teaching and learning process, the Quality Control Group periodically evaluates and the results will be followed up by the Head of the Study Program and also every lecturer to ensure the quality of the teaching and learning process.

Table 2 Student expectation and student perception & gap analysis for 27 HiedQual

No	Code	Indicators	Student Expectation		Student Perception		GAP (MP–ME)
			ME	SD	MP	SD	
		Teaching and Course Content					
1	TC1	Teachers responsive and Accessible	6.54	0.59	4.76	1.27	-1.78
2	TC2	Teachers follow Curriculum strictly	6.54	0.64	5.62	1.03	-0.92
3	TC3	Teachers follow good Teaching Practices	6.49	0.59	5.68	1.01	-0.81
4	TC4	Relevance b/w Program and Syllabus	6.30	0.64	5.44	1.20	-0.86
5	TC5	Course Content Develops students' Knowledge	6.47	0.64	5.36	1.04	-1.12
6	TC6	Department Informs schedules, exams, results etc.	6.54	0.51	5.42	1.25	-1.11
7	TC7	Teachers Complete Syllabus on time	6.27	0.72	4.79	1.26	-1.47
8	TC8	Department. has Sufficient Academic Staff	6.23	0.63	5.33	1.51	-0.90
		Overall Mean	6.42		5.30		-1.12
		Administrative Service					
9	AS1	Administrative Staff Provide Service without delay	6.53	0.57	4.92	1.29	-1.61
10	AS2	Administrative Staff are courteous and Willing to help	6.39	0.56	5.08	1.28	-1.31
11	AS3	Administrative Staff Provide Error free work	6.29	0.66	5.14	1.07	-1.15
12	AS4	Administration maintains accurate and Retrieval Records	6.58	0.52	5.03	1.40	-1.55
13	AS5	Administrative staff accessible during office hours	6.47	0.54	5.21	1.04	-1.26
14	AS6	University has safety and security measures	6.47	0.54	4.73	1.22	-1.74
		Overall Mean	6.46		5.02		-1.44
		Academic Facilities					
15	AF1	Department has adequate facilities	6.69	0.51	4.69	1.18	-2.00
16	AF2	Classrooms equipped with teaching aids	6.73	0.52	5.81	1.31	-0.92
17	AF3	Department has sufficient class rooms	6.60	0.56	4.53	1.47	-2.07
18	AF4	University has adequate auditoriums, conference halls etc.	6.64	0.53	5.58	1.23	-1.06
19	AF5	Library has adequate academic resources	6.66	0.62	5.75	1.36	-0.91
20	AF6	Computer labs have adequate equipment and internet facilities	6.68	0.54	5.82	1.27	-0.86
		Overall Mean	6.67		5.36		-1.30
		Campus Infrastructure					
21	CI1	University has adequate hostel facilities	6.27	0.90	4.73	1.37	-1.54
22	CI2	University has adequate medical facilities (Health Centers)	6.47	0.67	5.21	1.41	-1.26
23	CI3	University has adequate Amenities (Canteen, Shopping Centre, Bank, ATM, Post office, etc.)	6.44	0.68	5.35	1.36	-1.09
24	CI4	Campus infrastructure is well maintained.	6.58	0.66	4.51	1.13	-2.07
		Overall Mean	6.44		4.95		-1.49
		Support Service					
25	SS1	University has sufficient sports and recreation facilities.	6.63	0.59	4.83	1.14	-1.80
26	SS2	University/department provides placement services	6.66	0.58	5.95	1.30	-0.71
27	SS3	University provides counseling services	6.52	0.68	4.54	1.16	-1.97
		Overall Mean	6.60		5.11		-1.50

4.5. Service strategy recommendation using service improvement matrix (SIM)

The SIM score was then calculated using the mean score for the overall expectation and perception of service quality dimensions [44]. Through a plot of client satisfaction and the value of each service aspect, SIM allows decision-makers to view and comprehend the prospective parts for service improvement based on client

survey responses. The importance-satisfaction matrix is used in this study to help the college's management define improvement priorities on the five service quality aspects. The mean expectation shows how important service priority is, but the mean perception shows how satisfied people are. Using the mean expectation and mean perception, ratings were plotted on a two-dimensional grid to determine which improvements are required for satisfaction/performance (P), i.e. (low satisfaction score) and importance (I), i.e. (high importance score). The plotted position of each service aspect separated those that needed to be improved first.

Table 3 Service improvement matrix score

No	Symbol	Indicators	Student Expectation	Student Perception
		Teaching and Course Content	6.42	5.30
1		Teachers responsive and accessible	6.54	4.76
2		Teachers follow Curriculum strictly	6.54	5.62
3		Teachers follow good Teaching Practices	6.49	5.68
4	○	Relevance b/w Program and Syllabus	6.30	5.44
5		Course Content Develops students' Knowledge	6.47	5.36
6		Department Informs schedules, exams, results etc.	6.54	5.42
7		Teachers Complete Syllabus on time	6.27	4.79
8		Department. has Sufficient Academic Staff	6.23	5.33
		Administrative Service	6.46	5.02
9		Administrative Staff Provide Service without delay	6.53	4.92
10		Administrative Staff are courteous and Willing to help	6.39	5.08
11		Administrative Staff Provide Error free work	6.29	5.14
12	□	Administration maintains accurate and Retrieval Records	6.58	5.03
13		Administrative staff accessible during office hours	6.47	5.21
14		University has safety and security measures	6.47	4.73
		Academic Facilities	6.67	5.36
15		Department has adequate facilities	6.69	4.69
16		Classrooms equipped with teaching aids	6.73	5.81
17	◇	Department has sufficient class rooms	6.60	4.53
18		University has adequate auditoriums, conference halls etc.	6.64	5.58
19		Library has adequate academic resources	6.66	5.75
20		Computer labs have adequate equipment and internet facilities	6.68	5.82
		Campus Infrastructure	6.44	4.95
21		University has adequate hostel facilities	6.27	4.73
22		University has adequate medical facilities (Health Centers)	6.47	5.21
23	□	University has adequate Amenities (Canteen, Shopping Centre, Bank, ATM, Post office, etc.)	6.44	5.35
24		Campus infrastructure is well maintained	6.58	4.51
		Support Service	6.60	5.11
25		University has sufficient sports and recreation facilities	6.63	4.83
26	△	University/department provides placement services	6.66	5.95
27		University provides counseling services	6.52	4.54

Each SIM quadrant in Figure 1 indicates the URP Department's viewpoint on service quality based on student expectations and perceptions. The URP Department should focus on the dimensions of academic facilities, according to the SIM, because they have the lowest degree of satisfaction but are the most crucial for students. As a result, this aspect of the academic facilities requires immediate attention and action. The administrative service and teaching and course content dimensions show smaller gaps for the college because the quadrant shows these dimensions as crucial and have a higher level of student satisfaction than the other three dimensions plotted in-between quadrant strengths.
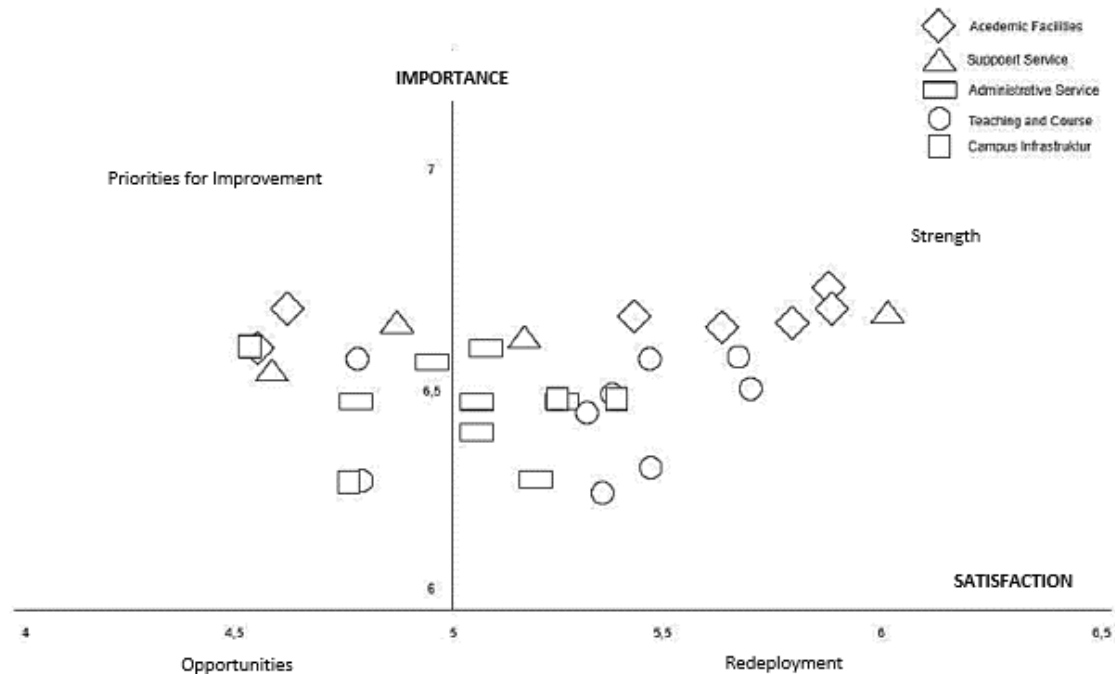
Figure 2 Service improvement matrix

In detail, the discussion of the condition of each dimension is described as follows.

1. Academic Facilities

The dimension of academic facilities describes the facilities and infrastructure in the learning process. Problems regarding the Department with sufficient classrooms is included in the improvement priority quadrant with low satisfaction and high importance scores and often an issue in academic dialogue activities held by the Department with the Student Association and the Faculty with the Student Executive Board. To solve this problem, the Faculty made a policy of sharing classroom facilities by listing each Department with a classroom with low utility. The classrooms will be used as facilities for sharing facilities that all departments can use. In addition, two smart classrooms in the Dean Building of the Faculty of Engineering are also provided for sharing facilities. In addition, as an educational institution, the URP department continues to strive to provide the best service. The Department always strives to know the needs of students and take appropriate steps to improve academic facilities. Periodically, the URP Department surveys student needs and builds discussion forums with students regarding the improvement and procurement of facilities. This is supported by lecturers and education staff who continue to build good relations with students. Discussion forums between lecturers, education staff, and students are one way to determine priorities for improving facilities.

Meanwhile, the Department has adequate facilities and classrooms equipped with teaching aids in the improvement priority quadrant with low satisfaction and high importance scores. The results of field observations indicate that some laboratory facilities are pretty old and need to be modernized. The Department has proposed a facility renewal in the Budget Plan. Meanwhile, for the dimensions of classrooms equipped with teaching aids, the Department has also equipped all classrooms with LCD projectors, sound systems, and OSH facilities. All areas of the University have been equipped with an internet network, and co-working spaces are available in every building and green open space.

2. Campus Infrastructure

The dimension of campus infrastructure includes the facilities provided by the university. The campus infrastructure is well maintained is included in the improvement priority quadrant with low satisfaction and high importance scores. Campus infrastructure is well maintained is also an indicator that has the highest gap in the dimensions of campus infrastructure. Periodic maintenance of infrastructure such as tables, chairs, stairs, ramps, lifts, OSH equipment, toilets, co-working spaces needs to be shortened so that the infrastructure is always in the best condition when used. The faculty conducts periodic maintenance audits by making a maintenance checklist. Periodic maintenance is also always included in the Faculty of Engineering budget plan.

3. Support Service

The dimension of support service includes the facilities provided by the university. The University provides counseling services is included in the improvement priority quadrant with low satisfaction and high

importance scores. Diponegoro University provides a Student Consultative Body which is always ready to help solve student problems. The procedure for consulting students at Diponegoro University is that students are required to consult with their guardian lecturers first. Then, if the guardian lecturer cannot resolve the problem, such as psychological problems, students will be referred to the UNDIP Student Consultative Body, which consists of experienced psychologists. However, the existence of the Consultative Body is not well known to students, and students are usually embarrassed if they have to consult with the Consultative Body. On the other hand, student access to the Consulting Body is also not easy because they have to go through the consultation stages in the Study Program (guardian lecturer), then the Faculty (Faculty Student Consultative Body), and then the UNDIP Student Consultative Body.

4. Teaching and Course Content

The dimension of teaching and course content includes the facilities provided by the university. The teachers responsive and accessible is included in the improvement priority quadrant with low satisfaction and high importance scores. Teachers' responsiveness and accessibility is a problem that students often complain about during academic dialogue. Some lecturers are difficult to contact or do not immediately answer questions from students. Several things that cause lecturers to be less responsive and not easily accessible are that the lecturers' workload is very high, and the communication ethics from students to lecturers is not polite. The Head of the Department asked the lecturers to schedule a particular time to receive student guidance and consult on academic matters to solve this problem. In addition, the Department puts up posters on the ethics of students communicating (sending messages) to lecturers. This communication ethic is also often conveyed during academic dialogues.

5. Administrative Service

The dimension of administrative service includes the facilities provided by the university. The University has safety and security measures is included in the improvement priority quadrant with low satisfaction and high importance scores. In order to continue to improve the ranking of institutions in the international arena, Diponegoro University programs international accreditation and university branding. One of the indicators that universities must meet in international accreditation is that the University has safety and security measures. The URP Department is seeking international accreditation and has good safety and security facilities and measures in place. OSH is a flagship program at the Faculty of Engineering in order to support the internationalization of study programs and open students' horizons on how to work with safety into a culture. OSH equipment is a priority in the budget plan and always gets regular maintenance.

V. CONCLUSION

In general, the URP Department has a service gap on all service factors, with the most significant gap seen in support services, campus infrastructure, and administrative services. The URP Department continually strives to reduce service gaps through various improvement efforts and pays attention and listens to every customer complaint. Periodically, the Faculty of Engineering, Diponegoro University, conducts internal academic audits and facilities that support service quality improvements in each Department. Periodically, each Department always makes efforts to improve its services, including the URP Department. Developing standards in service quality can encourage continuous improvement to formulate strategies to improve service quality and reduce the gap between student perceptions and expectations. The Faculty of Engineering supports efforts to improve the services of each Department, either through the Faculty budget or assistance from alumni and sponsorships. The URP Department is one of the leading departments in the Faculty of Engineering, which has had many collaborations both at home and abroad and has class collaborations with several institutions for master's programs and international undergraduate programs for undergraduate programs. Thus, in general, the service quality in the URP Department is classified as very good.

When establishing service plans, a PHEI should address the tripartite responsibilities and motivations of the customer (students), employees, particularly frontline personnel (academic and support staff who have direct contact with students), upper management, and various departments. According to [45], educational marketers and management should examine the role and influence of students' objectives in evaluating service quality when planning and developing their education programs to improve service quality. This is backed by [46] assertion that the boundary tier's (all personnel who have interaction with students) service to the customer tier (students) is highly dependent on the coordination tier (top HE management and its various Department).

Quality must stay at the forefront of future research agendas to pursue international rankings and certification in higher education. Future research should look at education quality from a multidimensional perspective, including quality, access, investment, and relevance [47].

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