



Analysis of Service Quality Measurement at Vocational Higher Education with the Higher Education Performance Method (HEdPERF) and Importance Performance Analysis (IPA)

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ABSTRACT

Higher Education Institutions (HEIs) need to possess and maintain a competitive advantage to effectively compete with other HEIs, and one of the ways to achieve this is by providing quality services. This study aims to measure service quality at Vocational Higher Education using the HEdPERF framework. The researchers add an indicator regarding an important aspect of vocational education. That is the alignment of the skills acquired by students during their internship with the actual job obtained, as a difference with other studies. The data analysis uses the IPA method. Out of the 47 indicators of service quality, there are 5 indicators in Quadrant A (Concentrate here) which are top priorities in formulating improvement strategies that consist of Teachers' Profile (Communication Skill) factors, Management Support factors (Safety Equipment and Administrative Work) and Facilities factors (Supporting Facilities). There are 24 indicators in Quadrant B (Keep Up The Good Work), 8 indicators in Quadrant C (Low Priority), and 10 indicators in Quadrant D (Possible Overkill). Some of the recommended improvement strategies are implementing lecturer creativity in learning, increasing lecturers competence in teaching communication, providing fast and easy administrative services, organizing safety training, reducing class capacity, renovating buildings, completing class needs, and doing routine chair maintenance.

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1. INTRODUCTION

Higher Education Institutions (HEIs) need to possess a competitive advantage to survive and maintain the continuity of the institution in the midst of aggressive competition. This is confirmed by the fact that Indonesia has 4,593

HEIs, with Vocational Higher Education reaches 1,190 in 2020 (Ministry of Higher Education Statistics, 2020). The large number of HEIs indicates those institutions which need to develop competitive advantages to maintain market sharing (Chandra et al., 2019). Another

function of HEI is to develop human resources that are current with the needs of the era so that they can compete in the domestic economy (Abbas & Sagsan, 2019).

The key to maintaining a competitive advantage for HEIs is the ability to deliver quality services (Tandijaya, 2018). Student satisfaction is significantly and positively impacted by service quality (Osman et al., 2017). Service quality can produce Word of Mouth which is the most effective communication in marketing services and can influence how prospective students choose HEIs (Widikusyanto, 2022). Service quality also influence in creating student loyalty (Annamdevula & Bellamkonda, 2016) through the provision of satisfying services (Fikri et al., 2016). Good service quality will determine the sustainability of the institution in maintaining its market share (Putra, 2017), so HEIs need to make continuous improvements to ensure that their service quality is maintained. Measuring the quality of the services delivered is the first step in figuring out improvement strategies. Gaps between the expected level of service performance and the perceived level of service will be identified by this service quality measurement (Purwanto, 2020).

One of the most significant challenges in evaluating service quality is selecting appropriate measurement instruments and defining quality indicators (Silva et al., 2017). The main difficulty lies in considering both operational and technical aspects (Ali et al., 2016). The indicators in the Service Quality (SERVQUAL) instrument developed by Parasuraman et al. (1998) are too general to be applied in the education field. Similarly, Cronin and Taylor's (1992) Service Performance (SERVPERF) only consider performance perceptions. In comparison, the Higher Education Performance (HEdPERF) and Higher Education Service Quality (HESQUAL) frameworks developed by Abdullah (2006) and Teeroovengadum et al. (2016) respectively are better suited to evaluating service quality in the education sector (Abbas, 2020). HEdPERF, in particular, is a comprehensive tool for measuring service quality in HEIs (Khalid, 2019) and is considered more complete (Ushantha & Kumara, 2016) than the HESQUAL

framework, which does not include an assessment of business relationships or industrial linkages (Puan et al., 2018). For this reason, HEdPERF was selected as the primary measurement tool for this study.

XYZ Polytechnic is a Vocational HEI managed by the ABC Foundation and sponsored by PT XYZ, Tbk. XYZ Polytechnic provides full scholarships and distributes graduates to corporate partners under the XYZ group. XYZ Polytechnic, established in 1981, requires continuous improvement to stay current and have a competitive advantage. Measurement of service quality needs to be conducted as evaluation material to accurately understand the students' responses toward the service activities delivered. This can be one of the strategies to continue producing skilled, high-quality, professional, and competitive graduates in accordance with the needs of the era and the vision and mission of the Polytechnic.

This research aim is to measure the service quality of XYZ Polytechnic using the HEdPERF framework. This research will focus on six important factors with more comprehensive indicators to measure the quality of service in HEIs, including Teachers' Profile, Curriculum, Facilities, Management Support, Employment Quality, and Students' Skills Development. The difference between the measurement framework in this study and the HedPERF framework is the researchers add an indicator of alignment of skills acquired by students during internships with actual jobs obtained (Vaughan, 2017). This study aims to identify areas of unsatisfactory service performance through the identified indicators and propose improvement strategies to improve low-value performance indicators.

2. LITERATURE REVIEW

Student Satisfaction

Tjiptono (1997) defines customer satisfaction or dissatisfaction is the result of how customers perceive the difference (disconfirmation) between their prior expectations and the actual performance of a product or service. In general, customers will prefer positive disconfirmations in service over negative disconfirmations. This conclusion can be subjective as it involves making a comparison between individual experiences and the standards of comparison

(Bressolles et al., 2014).

Students are considered the main customers in the context of HEIs (Sultan & Wong, 2013). Student satisfaction is a parameter of service quality in HEIs and a major concern in pursuing a competitive advantage (Townley et al., 2001). The definition of student satisfaction refers to the psychological state of happiness resulting from the evaluation of service attribute performance in the context of HEIs (Sultan & Wong, 2013). Student satisfaction is defined as the personal assessment made by a student regarding different results and information related to their education (Elliott & Shin, 2002). This is formed through repeated experiences in campus life, which can be seen from their loyalty to the campus, resulting in good graduates (Nugroho, 2020).

Student Loyalty

Student loyalty is a sense of affection or loyalty to the institution, which may include the academics, staff, faculties, and services provided by the HEI (Chang-Li, 2013). Student loyalty plays a crucial role in establishing the brand image of an HEI, both during and after the students' campus life, therefore this loyalty refers to the student's commitment to the institution throughout their study period and beyond (Hennig-Thurau et al., 2001) as well as a determinant of the success of a educational institutions (Boulding et al., 1993; Zeithaml et al., 1996). Loyal students will not leave campus and move on to other campuses (Duque, 2013), survive until they finish studying, encourage others and spread positive Word of Mouth.

Word of Mouth (WOM)

According to Kotler & Keller (2009), Word Of Mouth (WOM) Communication is a communication process in the form of providing recommendations both individually and in groups for a product or service that aims to provide personal information. This communication is private exchange between two or more people, such as between customers or between members of a group (Suprapti, 2010). Word of mouth that is obtained by customers through reliable sources such as professionals, friends, and family tends to be accepted more quickly. This is a different way to acquire references because service customers are usually difficult to evaluate services that

have not been purchased or have not been experienced by themselves.

Measurement of Service Quality in Higher Education

The main factor in developing a competitive advantage is service quality (Ali et al., 2012). Generally, service quality is determined by comparing customer expectations with how a product or service actually delivers (Parasuraman et al., 1988). Service quality in higher education is essential because positive perceptions of service quality have a significant effect on students satisfaction (Alves & Raposo, 2010). Service quality in higher education is defined as the difference between what students expect to receive and how they actually perceive the service (O'Neill & Palmer, 2004). In this research, the proposed definition of educational service quality is the activities conducted by HEIs to meet students' expectations, both in terms of academic and non-academic aspects.

Numerous publications offer a wide range of scales for evaluating service quality in measurement methods. The Service Quality (SERVQUAL) method was created by Parasuraman et al. (1988) and is used by businesses and researchers to measure service quality across various industries, including HEIs. This method contains five dimensions: tangible, reliable, responsive, assured, and empathic. However, SERVQUAL has received a lot of debate regarding the validity and reliability of the model for application to higher education (Silva et al., 2017). In addition, higher education service quality management studies suggest the use of industry-specific measurement models to investigate service quality in higher education (Silva et al., 2017) to achieve a deeper understanding and meaningful findings.

As an alternative, Cronin and Taylor (1992) introduced SERVPERF, an instrument that focuses on the performance levels of various attributes (Brady et al., 2002). Moreover, it has been argued that the performance-only approach is more appropriate in the HE context (Oldfield and Baron, 2000; Abdullah, 2006; Begum, 2009). This is mainly due to problems related to efforts to capture student expectations. Researchers argue that students

may not have specific expectations for services provided by higher education (Joseph and Joseph, 1997; Ford et al., 1999; Angell et al., 2008).

Firdaus Abdullah developed a measurement scale called Higher Education Performance (HEdPERF) which was based on the SERVPERF model. This development was in consideration of global advancements in the education sector (Silva et al, 2017). The research conducted by Abdullah (2005) aims to measure service quality specifically in the field of education, particularly higher education. In his research, Abdullah (2005) proposed HEdPERF to measure the service quality of HEI consisting of six dimensions, namely (1) academic aspects which only consist of academic responsibilities, (2) non-academic aspects which consist of crucial elements that help students fulfill learning obligations related to non-academic staff assignments, (3) program issue which emphasizes the importance of offering a specialization program with a flexible structure and syllabus, (4) reputation that loaded with indicators showing the importance of HEIs in projecting a professional image, (5) access consisting of indicators related to issues such as approachability, ease of discretion, availability and convenience, and (6) understanding related to the special needs of students in terms of counseling and health services. Icli and Anil (2014) suggest that HEdPERF is the most developed scale in the literature measuring the service quality of HEIs.

3. RESEARCH METHOD

HEIs must provide satisfactory service so that students are loyal to the institution (Silva et al., 2017). Student loyalty arising from HEIs' good service will indirectly maintain the HEIs sustainability. Therefore, the steps in measuring

the HEIs service quality are as follows:

Study design

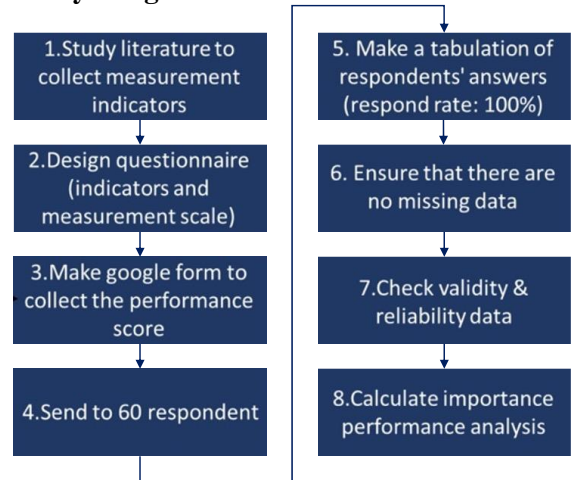


Fig. 1. Research flowchart

An exploratory study design was adopted to analyze student perceptions of the service quality performance of the XYZ Polytechnic using the HEdPERF scale from Silva et al (2017). The flowchart how to get research data is shown in Fig. 1. The first stage in the measurement process is to prepare a list of dimensions and indicators that will be used as a reference for measurements. In this study, the list of dimensions and indicators that will become a reference refers to the research of Silva et al (2017). The Silva et al. (2017) framework is used since it is a quality measurement framework that focuses on the education sector. Silva et al's research (2017) refers to the higher education sector in general, so that essential aspects of vocational education still need to be added. Alignment of internship skills with the job is an important aspect of vocational education (Vaughan, 2017).

Table 1. HEIs service quality measurement framework

Factor	Sub Factor	Indicator Code	Indicator	Ref
Teachers' Profile	Subject Knowledge	SK1	Teachers have comprehensive knowledge about the field of teaching	Silva et al., 2017
		SK2	Teachers have up to date knowledge	Silva et al., 2017
		SK3	Teachers are able to answer questions from students	Silva et al., 2017
		SK4	Teachers are able to provide real application examples of the taught subjects	Silva et al., 2017
	Communication	CS1	Teachers have good communication skills	Silva et al., 2017

Factor	Sub Factor	Indicator Code	Indicator	Ref
	<i>Skills</i>	CS2	Teachers have good foreign language skills	Silva et al., 2017
		CS3	Teachers are able to teach complex concepts using simple analogies	Silva et al., 2017
		CS4	Atmosphere of the teacher's class is interesting (not boring)	Silva et al., 2017
		CS5	Teachers try to build interactive classes	Silva et al., 2017
	<i>Teaching Styles</i>	TS1	Teachers ensure that students participate actively in class	Silva et al., 2017
		TS2	Teachers use a variety of tools and techniques to increase students interest in learning	Silva et al., 2017
		TS3	Teachers do not discriminate in class	Silva et al., 2017
	<i>Behavior with Students</i>	BT1	Teachers shows interest (intention) in providing suggestions related to students academic problems	Silva et al., 2017
		BT2	Teachers use fair assessment criteria	Silva et al., 2017
		BT3	Teachers provide regular feedback regarding student performance	Silva et al., 2017
<i>Curriculum</i>	<i>Curriculum Quality</i>	CQ1	The taught curriculum of the college is comprehensive and easy to understand	Silva et al., 2017
		CQ2	The taught curriculum helps students to develop creativity	Silva et al., 2017
		CQ3	The taught curriculum of the college improves intellectual abilities (example: the ability to identify and solve problems)	Silva et al., 2017
		CQ4	The college curriculum is in line with the abilities (skills) required in the workplace	Silva et al., 2017
		CQ5	Library collections support students learning needs	Silva et al., 2017
<i>Facilities</i>	<i>Learning Facilities</i>	LF1	The college provides learning facilities such as blackboards, projectors, etc.	Silva et al., 2017 Neill et al., 2006
		LF2	Classes are held according to a predetermined schedule	Silva et al., 2017
	<i>Supporting Facilities</i>	SF1	The college provides supporting facilities such as a canteen	Silva et al., 2017 Neill et al., 2006
		SF2	The canteen menu quality is varied and has a delicious taste	Silva et al., 2017
		SF3	The number of classrooms is sufficient and well maintained	Silva et al., 2017
	<i>Cleanliness and Maintenance</i>	CM1	Campus is neat and clean	Silva et al., 2017
		CM2	Beautiful campus atmosphere	Silva et al., 2017
<i>Management support</i>	<i>Administrative Work</i>	AW1	Administrators and education staffs have good communication skills	Silva et al., 2017 Neill et al., 2006
		AW2	Admin and education staffs master the job description	Silva et al., 2017 Neill et al., 2006
		AW3	Administrators and staffs provide accurate and up to date information	Silva et al., 2017 Neill et al., 2006
		AW4	Administrative processes are clear and well structured	Silva et al., 2017 Neill et al., 2006
	<i>Behavior with Students</i>	BM1	Staffs serve students without discriminating the students' backgrounds	Silva et al., 2017 Neill et al., 2006 Lukman & Setiani, 2019
		BM2	Polite behavior of staffs towards students	Silva et al., 2017 Neill et al., 2006 Lukman & Setiani, 2019
	<i>Security Measure</i>	SM1	There is a security guard	Silva et al., 2017
		SM2	Security officers carry out their functions properly and professionally	Silva et al., 2017
		SM3	Security officers have qualified equipment	Silva et al., 2017
	<i>Safety</i>	SE1	Students feel safe in the college environment	Silva et al., 2017

Factor	Sub Factor	Indicator Code	Indicator	Ref
	Equipment	SE2	Availability of disaster evacuation tools and procedures (Fire, Flood and Earthquake)	Silva et al., 2017
Employment quality	Link with Employer	LE1	The college has a strong cooperative relationship with industry regarding graduate job opportunities	Silva et al., 2017
		LE2	The college helps its graduates to find jobs	Silva et al., 2017
		LE3	The alignment of the skills acquired during the internship with the actual job obtained	Vaughan, 2017
	Employability Training	ET1	The college has a good impression on the industrial community regarding the performance of its graduates	Silva et al., 2017
		ET2	The college has a good reputation regarding the job security of its graduates	Silva et al., 2017
Student skills development	Extra-Curricular Activities	EA1	The college organizes various extracurricular activities	Silva et al., 2017
		EA2	Extracurriculars are held on a regular schedule	Silva et al., 2017
	Personal Development	PD1	College atmosphere encourages students to develop soft skills (communication skills, problem solving & critical thinking)	Silva et al., 2017
		PD2	The education held develops leadership and teamwork	Silva et al., 2017

Participants

Students from XYZ Polytechnic participated as the respondents of this study with the criteria: (1) XYZ Polytechnic students, (2) students who have completed an internship program for at least one year, and (3) are currently or have finished their final internship. There were 360 students of XYZ Polytechnic, but only 60 students were eligible to participate as respondents. Based on the existing respondent criteria, this research will involve all respondents who meet the criteria.

3	Important Enough	3	Good Enough
4	Important	4	Good
5	Very Important	5	Very Good

Instruments

The instrument used in this research is a questionnaire. The indicators on the questionnaire are shown in Table 1. The validity of the received questionnaire (response rate) is 100%. The rating scale on the questionnaire is a Likert scale of 1 to 5 (Lukman & Setiani, 2019). The IPA method rating scale has two categories that consists of Importance and Performance scales. Details of the importance level rating scale (Importance) and performance level (Performance) are shown in Table 2.

Table 2. Importance and performance rating scale

Importance		Performance	
Value	Explanation	Value	Explanation
1	Very Unimportant	1	Very Bad
2	Unimportant	2	Not Good

Calculation Methods

The questionnaire's rating scale is an ordinal Likert scale, so the data must be converted first into an interval scale before being processed using the IPA method because an ordinal scale cannot be subject to mathematical operations and needs to be converted to a minimum interval scale (Uma & Bougie, 2016). The steps for converting the ordinal scale to intervals are as follows (Ningsih & Dukalang, 2019):

1. Calculate the frequency of answers for each ordinal data.
2. Multiply the frequency with the ordinal value.
3. Based on the frequency of each category, calculate the proportion value.
4. After the proportion values are obtained, calculate the cumulative proportions for each category.
5. Calculate the Z value for each cumulative proportion (using =NORMSINV in Excel).
6. Determine the limit of the Z values (the value of the function at probability at Z) for each category using =NORMDIST).
7. Calculate the scale value (average

interval) for each category through the equation:

Scale = lower limit density - upper limit density/area below the upper limit - lower limit area.

8. Calculate the score (transformed value) for each category through the equation:
Score = scale value + |Scale valuemin| +1

After the data is collected and converted into an interval scale, it is processed using the IPA method with detailed calculations as follows:

Step 1 – Calculate the gap analysis by calculating the average of each indicator based on the assessment of importance level and the assessment of performance level using Equations (1) and (2).

$$X = \frac{\sum_{i=1}^n X_i}{n} \dots\dots\dots(1)$$

$$Y = \frac{\sum_{i=1}^n Y_i}{n} \dots\dots\dots(2)$$

Where,
X= Average score of each performance indicator; Y= Average score of each importance indicator; N= Number of respondents.

Step 2 – Calculate the GAP of each indicator using Equation 3.

$$GAP = X - Y \dots\dots\dots(3)$$

Where,
GAP= The difference in expectations between performance level and importance level
X = Average score of each performance indicator; Y =Average score of each importance indicator.

The results of the GAP calculation show that a minus value means that students are not satisfied with the indicator, while a plus value indicates that students are satisfied. To facilitate data processing, the GAP calculation tabulation will be arranged as shown in Table 3.

Table 3. GAP Analysis Tabulation Design

Indicator	X	Y	Interpretation
XXXX			
.....			

Xxx1			
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Step 3 – Draw a Cartesian diagram from IPA method.

Before drawing a Cartesian diagram of IPA, determine the boundary between the X axis (a) and the Y axis (b) to divide the quadrants in a Cartesian diagram. Equations (4) and (5) can be used to calculate the boundaries.

$$a = \frac{\sum_{i=1}^k X_i}{k} \dots\dots\dots(4)$$

$$b = \frac{\sum_{i=1}^k Y_i}{k} \dots\dots\dots(5)$$

Where,
a= Boundary between X-axis; b= Boundary between Y-axis; k = number of indicators
IPA Cartesian diagram can be seen in Figure 2.

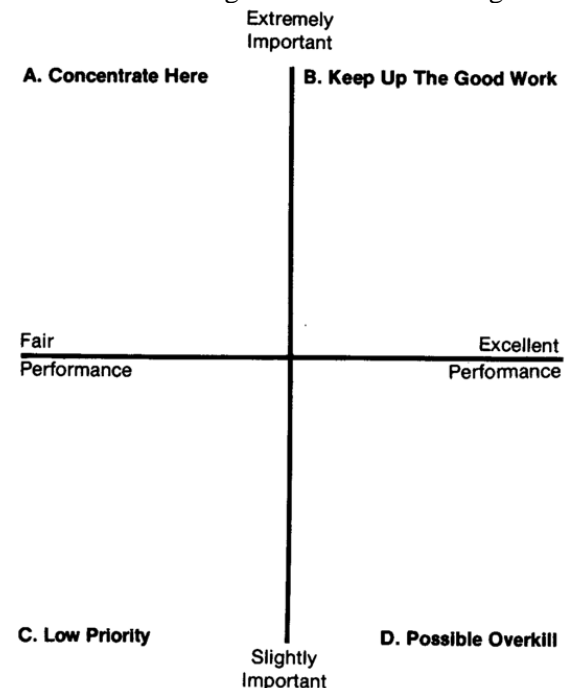


Fig. 2. IPA Cartesian diagram

4. RESULT AND DISCUSSION

Results

The validity test is conducted by comparing the r count and r-table values of each existing indicator using the IBM SPSS 25 software. The questionnaire is considered valid if the r count value > the r table (Ghozali, 2018). R table can be seen in the product moment r table distribution data. Using a significance level of 5% with 60 samples, the r table value of 0.254 is obtained. The 47 performance level indicators

(X) and the level of importance (Y) are all considered to be valid based on the data testing results because all r count indicators are greater than the r table values.

Table 4. Validity Test Result

Indicator	r count Performance	r count Importance	r table	Remark
SK1	0,833	0,670	0,254	Valid
SK2	0,835	0,598	0,254	Valid
SK3	0,865	0,633	0,254	Valid
SK4	0,795	0,593	0,254	Valid
CS1	0,855	0,663	0,254	Valid
CS2	0,821	0,517	0,254	Valid
CS3	0,804	0,602	0,254	Valid
CS4	0,874	0,713	0,254	Valid
CS5	0,645	0,677	0,254	Valid
TS1	0,740	0,541	0,254	Valid
TS2	0,851	0,686	0,254	Valid
TS3	0,667	0,577	0,254	Valid
BT1	0,730	0,762	0,254	Valid
BT2	0,827	0,763	0,254	Valid
BT3	0,863	0,745	0,254	Valid
CQ1	0,816	0,782	0,254	Valid
CQ2	0,778	0,796	0,254	Valid
CQ3	0,841	0,820	0,254	Valid
CQ4	0,738	0,692	0,254	Valid
CQ5	0,696	0,750	0,254	Valid
LF1	0,656	0,684	0,254	Valid
LF2	0,753	0,707	0,254	Valid
SF1	0,629	0,729	0,254	Valid
SF2	0,704	0,715	0,254	Valid
SF3	0,733	0,771	0,254	Valid

Indicator	r count Performance	r count Importance	r table	Remark
CM1	0,657	0,573	0,254	Valid
CM2	0,634	0,722	0,254	Valid
AW1	0,799	0,757	0,254	Valid
AW2	0,772	0,788	0,254	Valid
AW3	0,776	0,759	0,254	Valid
AW4	0,794	0,868	0,254	Valid
BM1	0,745	0,822	0,254	Valid
BM2	0,780	0,802	0,254	Valid
SM1	0,759	0,652	0,254	Valid
SM2	0,760	0,705	0,254	Valid
SM3	0,817	0,774	0,254	Valid
SE1	0,761	0,858	0,254	Valid
SE2	0,485	0,772	0,254	Valid
LE1	0,372	0,546	0,254	Valid
LE2	0,378	0,523	0,254	Valid
LE3	0,618	0,728	0,254	Valid
ET1	0,775	0,792	0,254	Valid
ET2	0,690	0,703	0,254	Valid
EA1	0,667	0,494	0,254	Valid
EA2	0,653	0,550	0,254	Valid
PD1	0,710	0,819	0,254	Valid
PD2	0,588	0,697	0,254	Valid

A construct or variable is said to be reliable if it gives a Cronbach Alpha value > 0.6 (Ghozali, 2012). The closer the Cronbach's Alpha value to 1, the more reliable and consistent the data will be if the measurement is repeated. According to the results of the data reliability testing, the importance level indicator's Cronbach's Alpha value was 0.977, while the performance level indicator's value was 0.981, indicating that the data was considered reliable as shown in Table 5.

Table 5. Reliability Test Result

Cronbach's Alpha (Importance)	Cronbach's Alpha (Performance)	Cronbach's Alpha Value	Remarks
0,977	0,981	> 0,600	Reliable

Data processing using the IPA method begins by converting the data from an ordinal scale questionnaire to an interval scale; this is related to the characteristics of ordinal scale data that cannot be subject to mathematical operations. The conversion results are used to calculate the average of each indicator based on the performance level (X) and importance level (Y). The calculation results of the IPA analysis are shown in Table 6.

Table 6. IPA Analysis Results

Item Code	X	Y	GAP	Interpretasi
SK1	5,05	3,49	1,56	Kuadran D (Possible Overkill)
SK2	5,05	5,49	-0,44	Kuadran B (Keep Up The Good Work)
SK3	4,92	5,49	-0,56	Kuadran B (Keep Up The Good Work)
SK4	4,48	5,23	-0,75	Kuadran B (Keep Up The Good Work)
CS1	4,73	5,06	-0,34	Kuadran B (Keep Up The Good Work)
CS2	4,59	4,49	0,10	Kuadran D (Possible Overkill)
CS3	4,45	5,49	-1,04	Kuadran B (Keep Up The Good Work)
CS4	4,19	5,23	-1,04	Kuadran A (Concentrate Here)
CS5	3,46	5,23	-1,76	Kuadran A (Concentrate Here)
TS1	4,45	4,75	-0,31	Kuadran D (Possible Overkill)
TS2	4,73	5,06	-0,34	Kuadran B (Keep Up The Good Work)
TS3	4,92	5,49	-0,56	Kuadran B (Keep Up The Good Work)
BT1	5,05	5,49	-0,44	Kuadran B (Keep Up The Good Work)
BT2	5,03	5,23	-0,20	Kuadran B (Keep Up The Good Work)
BT3	4,73	5,00	-0,27	Kuadran B (Keep Up The Good Work)
CQ1	4,73	5,06	-0,34	Kuadran B (Keep Up The Good Work)
CQ2	4,46	4,49	-0,02	Kuadran D (Possible Overkill)
CQ3	5,03	5,06	-0,03	Kuadran B (Keep Up The Good Work)
CQ4	5,05	5,49	-0,44	Kuadran B (Keep Up The Good Work)
CQ5	3,03	3,49	-0,46	Kuadran C (Low Priority)
LF1	4,81	5,23	-0,42	Kuadran B (Keep Up The Good Work)
LF2	4,81	4,94	-0,13	Kuadran B (Keep Up The Good Work)
SF1	2,94	3,49	-0,55	Kuadran C (Low Priority)
SF2	3,06	3,06	0,00	Kuadran C (Low Priority)
SF3	3,46	5,23	-1,76	Kuadran A (Concentrate Here)
Item Code	X	Y	GAP	Interpretasi
CM1	5,05	4,49	0,56	Kuadran D (Possible Overkill)
CM2	4,92	5,23	-0,30	Kuadran B (Keep Up The Good Work)
AW1	4,48	4,49	-0,01	Kuadran D (Possible Overkill)
AW2	4,83	5,06	-0,24	Kuadran B (Keep Up The Good Work)
AW3	4,22	3,49	0,74	Kuadran C (Low Priority)
AW4	3,50	5,06	-1,57	Kuadran A (Concentrate Here)
BM1	4,48	4,94	-0,46	Kuadran B (Keep Up The Good Work)
BM2	4,48	4,23	0,25	Kuadran D (Possible Overkill)
SM1	3,46	4,06	-0,60	Kuadran C (Low Priority)
SM2	3,48	4,06	-0,58	Kuadran C (Low Priority)
SM3	3,48	4,06	-0,58	Kuadran C (Low Priority)
SE1	4,65	4,49	0,17	Kuadran D (Possible Overkill)
SE2	3,51	5,49	-1,98	Kuadran A (Concentrate Here)
LE1	4,50	5,40	-0,90	Kuadran B (Keep Up The Good Work)
LE2	5,27	5,23	0,04	Kuadran B (Keep Up The Good Work)
LE3	4,50	5,49	-0,99	Kuadran B (Keep Up The Good Work)
ET1	5,46	5,23	0,24	Kuadran B (Keep Up The Good Work)
ET2	5,46	5,31	0,15	Kuadran D (Possible Overkill)
EA1	4,50	4,49	0,01	Kuadran D (Possible Overkill)
EA2	3,51	4,49	-0,98	Kuadran C (Low Priority)
PD1	4,48	4,49	-0,01	Kuadran D (Possible Overkill)
PD2	4,84	5,49	-0,64	Kuadran B (Keep Up The Good Work)
a	4,45			
b		4,76		

According to Table 4, there are 5 indicators categorized in Quadrant A (Concentrate Here), indicating that these indicators have a significant impact on educational service

satisfaction, but have not met the expectations of service users. XYZ Polytechnic needs to immediately improve these 5 indicators that are in Quadrant A. There are 24 indicators categorized in Quadrant B (Keep Up The Good Work) which play a crucial role in meeting the expectations of service users. Quadrant C (Low Priority) consists of 8 indicators that are considered low priority for improvement because service users perceive them as unimportant and having minimal impact on their satisfaction with the service. There are 10 indications in Quadrant D (Possible Overkill) with a low importance and high performance. In service users perspective, attributes in this quadrant are not particularly significant.

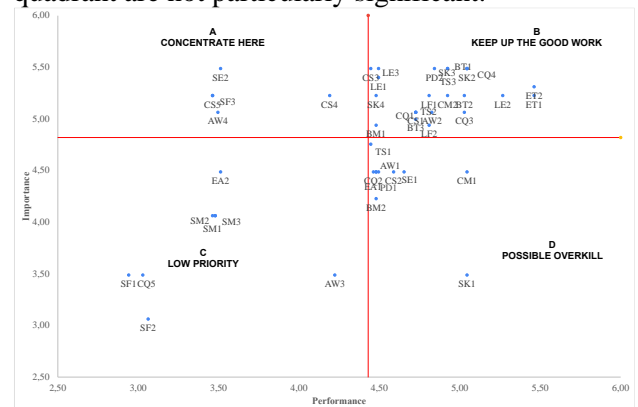


Fig. 3. Result of IPA Cartesian diagram

The results of the IPA Cartesian diagram are as shown in Figure 3. Based on the process of the IPA method, there are 5 indicators that are in Quadrant A (Concentrate here) including (1) CS4 Indicator (Atmosphere of the teacher's class is interesting (not boring)), (2) CS5 Indicator (Teachers try to build interactive classes), (3) SE2 Indicator (Availability of tools and procedures for disaster evacuation (Fire, Flood and Earthquake)), (4) Indicator SF3 (Number of classrooms is sufficient and well maintained) and (5) Indicator AW4 (Administration process is clear and well structured). The improvements will be focused on these 5 indicators in Quadrant A.

Discussion

The data processing results using the IPA methodology indicate the top five service quality indicators in Quadrant A (concentrate here) should be the focus of improvement strategies. This is because the perception of performance is delivered so far which has not been appropriate. However, it is very important

for service users. These indicators include the Teachers' Profile factor related to Communication Skills, the Management Support factor related to Safety Equipment and Administrative Work, and the Facilities factor related to XYZ Polytechnic Supporting Facilities.

- a. Teachers' Profile factor, Communication Skill Sub-factor: CS4 (Atmosphere of the teacher's class is interesting (not boring))

Quality learning is most likely to occur when students are actively and purposefully engaged with issues and activities they regard as important (Ghufron, 2017). Quality learning outcomes depend on a quality learning process, the learning process depends on the teacher's ability to create a conducive learning environment so that all students are actively involved in the learning process. Teachers must at least use creativity in the classroom to develop and modify lesson plans and create a quiet and engaging learning environment (Dasna, 2015).

Based on the results of the interview with several respondents, the current unattractive and boring class atmosphere is because the teacher delivers the material in a monotonous way and refers to what is written on the power point slides without giving other explanations. Recommendations for improvement for this problem are that teachers should modify learning materials, for example, by using multimedia technology such as video or audio as learning media to explain difficult concepts (e.g. theory of constraint, system modelling, etc) in an interesting way. The kind of learning media used by the teacher has an impact on how well students learn and think (Nookhong, 2015). Moreover, the teacher should include adding humor or fun activities in order to create a favorable learning environment. Humor can be considered as an effective strategy for creating a comfortable learning environment that can increase students' willingness to complete their assigned activities (Baxter & Wilmot, 1984; Graham, 1995).

- b. Teachers' Profile factor, Communication Skill sub-factor: CS5 (Teachers try to build interactive classes)

Communication competence is a crucial skill for teachers, as it involves their ability to model and manage teaching communication (to manage interactions and control social

situations, determine and change the goals of teaching communications and conversations, etc.) thus enhancing teachers' effectiveness across all aspects of the learning process (Zlatic, 2014). Teachers can encourage students to equate their understanding of the material being studied with what is indicated by the term "student-centered learning", where students learn in a way that goes beyond what the teacher teaches them (Dasna, 2015). In this situation, students engage in interactive dialogue with other students as well as with teachers. Interactive learning happens when communication becomes effective.

Recommendations for improvements to building interactive classes are by managing interactions between students and instructors and between students through the selection of learning methods or techniques. In addition to effective communication, learning techniques can also build learning motivation and make students more involved in learning and get more information (Senthamarai, 2018). Several learning methods can be applied, including (1) cooperative learning (e.g. groups working in teams on a common goal), (2) problem-based learning (e.g. students pitching ideas and creating their own business plans to solve a societal need), (3) simulations (e.g. students use a model of behavior to gain a better understanding of that behavior), (4) brainstorming (e.g. meeting to discuss and address business strategy problems) and (5) role-playing (e.g. students learn what it is like to serve others and to be served by a role playing lesson at a restaurant. It extends students' speaking skills beyond the classroom) (Afandi, 2013). Learning methods that are interactive and based on challenging things during learning can be a solution to help to learn become more optimal (Daryanes, 2023).

- c. Management Support factor, Safety Equipment sub-factor: SE2 (Availability of disaster evacuation tools and procedures (Fire, Flood and Earthquake))

Student satisfaction is highly correlated with the availability of safety equipment since it impacts how secure and comfortable students feel (Idochi et al., 2000). Safety equipment is part of management support, this equipment is related to campus efforts to mitigate risks such as fires, floods and earthquakes.

The availability of safety equipment is an

important aspect for students, this is related to the location of the XYZ Polytechnic which is in the Industrial area, and the location of XYZ Polytechnic which is prone to flooding. Besides the availability of safety equipment, several respondents revealed that the lack of socialization on the placement of safety equipment and equipment operating procedures was the cause of student dissatisfaction, therefore the implementation of safety training was an strategy to increase student satisfaction. This safety training aims to socialize the location of safety equipment (APAR, Hydrant and flood sand bags) and safety equipment operating procedures.

- d. Management Support factor, Administrative Work sub-factor: AW4 (Clear and well-structured administrative process).

Administrative work is a service quality dimension related to administrative staff services in supporting academic services provided. Types of quality services include (1) student administration services such as student activities, student associations, (2) general administrative services such as the process of applying for student activity funding, procurement of equipment, and maintenance of campus buildings and facilities, (3) document processing activities such as processing of letters and (4) book services such as providing literature that aligns with science (Hui Li Gao, 2020). Fast and uncomplicated administrative procedures are crucial factors that impact student satisfaction with academic services, which are related to administration (Tawassi, 2017).

Based on the results of interviews with several respondents, one of the reasons for the current dissatisfaction with administrative services is the absence of standardized and speedy service procedures. As an example of a quick and easy procedure for borrowing and returning books, this is related to non-standard library opening hours. A recommendation for improvement for the problem of returning books is to provide a book return corner. The book return corner is a box that is spread in various areas of the campus as a place for students to return books. The mechanism for the idea of a book return corner starts with librarians who will routinely pick up books at the return corner and match them with

the list of borrowers, then if there are books that are damaged or have not been returned, then the librarian can notify the borrower. Another example that causes administrative services to be considered unsatisfactory is that all requests related to correspondence or leave applications have to be done offline, which makes providing an online system for permits and correspondence an alternative solution for improving administrative services.

- e. Facilities factor, Supporting Facilities sub-factor: SF3 (Number of classrooms is sufficient and well maintained).

Supporting facilities or educational infrastructure are one of the National Education Standards that must be fulfilled by educational providers, so the completeness of facilities and infrastructure is a necessity for the smoothness of the learning process (Suliyarti, 2019). Management of educational facilities and infrastructure need to ensure the availability of the required facilities and infrastructure (Darmastuti, 2014). The availability of adequate facilities and infrastructure must be balanced with maintenance activities for these facilities and infrastructure. Maintenance is an effort made to maintain and manage every existing facility and infrastructure so that it remains in good condition and is suitable for optimal use (Gustituati, 2013).

Based on the results of interviews with several respondents, one of the causes of the Supporting Facilities being felt to be unsatisfactory is the number of classrooms which are still limited so that they do not meet the ideal capacity to be able to provide maximum space for movement. Recommendations for this problem are reducing class capacity or renovating the building considering the age of the XYZ Polytechnic building which is old. Moreover, students feel dissatisfied with the limited availability of sockets both in class and in other facilities such as the library. The recommendation related to these problems is that the XYZ Polytechnic should add the needs that should be in the classroom or other facilities. Another thing that affects student satisfaction is the lack of chairs maintenance in the classroom causes students feel uncomfortable and less focused during class. To address this issue, it is recommended that regular maintenance of students' chairs be

conducted or purchasing new ones.

5. CONCLUSION

Based on the results and discussion of the research that has been conducted at XYZ Polytechnic, it can be concluded that: (1) The service performance indicators that become Top Priority for unsatisfactory service users based on the IPA Method are indicators CS4, CS5, SE2, SF3 and AW4 that shown in Table 4. This low-value indicators become the focus in formulating improvement strategies to improve service quality, the strategies proposed are (2) modifying learning materials, adding some humor or fun activities, managing learning methods, safety training implementation, providing a book return corner, providing an online system for permits and correspondence, reducing class capacity or renovating the building, adding the needs that should be in the classroom or other facilities, and conducting regular maintenance for students' chairs or purchasing new ones. Quality services can potentially produce quality graduates. Therefore, the next study that will be conducted is to analyze the relationship between the quality of XYZ Polytechnic graduates and the level of recruitment, or the ease with which graduates to get jobs.

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