HEISQUAL – ACSI – IPA – PGCV: Synthesis of higher education service satisfaction measurements

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Abstract

The current weakness of various dimensions of service quality measurement scales that have been adopted in measuring the level of student service satisfaction at HE is often an obstacle to understanding weaknesses in the quality of HE service. This study aims to investigate the level of student service satisfaction based on the HEISQUAL synthesis combined with the ACSI, IPA, and PGCV methods as a holistic approach to determine priorities for continuous improvement. The integration of these three methods is very appropriate to answer the needs of HE in improving the quality of its services. The data in this study were obtained by distributing questionnaires to respondents with a sample size of 320 students using a convenience sampling technique (non-probability sampling). The results of this study indicate that HE service satisfaction is in the satisfied criteria, where 6 sub-dimensions are in quadrant A, 5 sub-dimensions are in quadrant B, 1 sub-dimension is in quadrant C, and 4 sub-dimensions are in quadrant D. From this analysis, the priority order of improvement are 1) ET, 2) LWE, 3) LF, 4) ECA, 5) C&M, 6) BTS. Through the HEISQUAL – ACSI – IPA – PGCV synthesis, HE can understand and determine well-accelerated strategic and practical policies.

Introduction

The quality of service felt by students is a form of overall evaluation of the goodness or badness of a service provided by the Higher Education (HE) (Twaissi & Al-Kilani, 2015). Providing high service quality not only helps to retain existing customers, but also to attract new customers as a consequence of positive recommendations to other stakeholders, such as prospective students, graduate users, parents, and policy stakeholders (Ladhari, 2009). This requires that HE's operating in a competitive environment must consider how to provide high quality services to meet the needs of stakeholders (Mwiya et al., 2017).

Students are the most important stakeholders to pay attention to in measuring the quality of services provided by HE. The satisfaction of other stakeholders, such as parents, graduate users, cooperation partners, alumni, and policymakers is highly dependent on the level of student satisfaction with the quality of services provided by HE (Ahmed et al., 2010). Measuring the level of student satisfaction with the quality of educational services is a growing area of activity at universities globally (Ada et al., 2017; Sohail & Hasan, 2021).

The services provided by HE currently have an important role in the structure of the national economy (Abbas & Sagsan, 2020). This causes HE to be market-oriented and controlled by the market like business organizations in general which demand performance indicators related to quality assurance (Li, 2018). HE must continue to carry out continuous innovation in providing effective services to provide satisfaction to students to gain competitive advantage through evaluating the gap between expectations and reality felt by students (Dora, 2017). The success of HE is largely determined by the certainty of satisfaction felt by students with the quality of services provided (Guilbault, 2018).

The Gross Enrollment Rate (GER) in higher education in the world has increased 3-fold in the last two decades (UNESCO, 2022). This was also followed by a massive increase in the number of tertiary institutions which is expected to continue to increase in the next decade (Hewitt, 2020). As stated by Altbach (2004), the significant increase in student GER resulted in state universities being unable to accommodate all students, opening up great opportunities for the private sector to compete in establishing HE institutions. Private universities accommodate a larger number of students than public universities, with a proportion of 60.3%:39.7% (Solehuddin, 2023). Ironically, most students in private universities are not satisfied with the quality of services provided (Le et al., 2021; Truong et al., 2016).

The massification of HE establishment has positive and negative impacts on the community. One of the positive impacts is that students can have many choices to continue their education in HE, giving rise to more intense competition to obtain prospective students and maintain the existing student body (Musselin, 2018; Truong et al., 2016). However, the massive growth of HE also raises problems in terms of education quality (Ali et al., 2016; Draskovic et al., 2020). Most HEs compromise on the quality of services provided by students, such as the ease of graduating and getting a high GPA, the inaccuracy of competencies possessed by students with industrial needs, as well as the availability of outdated learning facilities and infrastructure, causing current employers not to produce grade transcripts as a prerequisite for job vacancies (Abbas & Sagsan, 2020; Serhan et al., 2016; Shi, 2020).

This phenomenon makes the quality of HE services a critical issue that must be continually evaluated on an ongoing basis with valid and reliable measurement dimensions and indicators (Abbas, 2020b; Qureshi et al., 2021; Sohail & Hasan, 2021). However, the problem is that academics still have difficulty understanding the construct of service quality, especially in defining the concept and measurement scale (Asnawi & Setyaningsih, 2020). The relevant dimensions of service quality in HE are still being debated and are an interesting literature study (Rafik & Priyono, 2018; Silva et al., 2017). Several service quality measurement instruments that are popularly used by HE, namely Service Quality (SERVQUAL), Service Performance (SERVPERF), and Higher Education Performance (HEdPERF) are considered not relevant enough to conditions in HE and ignore operational and technical aspects (Ali et al., 2016; Galeeva, 2016; Sultan & Yin Wong, 2010), so that it often results in discriminant validity, poor reliability and the problem of limiting variance (Ladhari, 2009; Wong et al., 2012).

Abbas (2020a) popularized a service quality instrument called Higher Educational Institution Service Quality (HEISQUAL). This dimension of measurement scale is considered more relevant to today's HE environment, which has experienced many social, political, technological and economic changes over the last two decades. It investigates salient service quality themes from the perspective of students in HE environments. HEISQUAL is the development of Higher Educational Service Quality (HESQUAL), popularized by Teeroovengadum et al. (2016). Weaknesses carried out by several previous studies are that it only uses the calculation of the weighted average value, the value per element and the overall value of the service aspect without the support of a service satisfaction index measurement tool and the determination of priority scales for improvement on the service quality dimensions of HE (Hassan et al., 2019; Kanwar & Sanjeeva, 2022; Wong & Chapman, 2023).

Based on the problems that have been described above, the researchers is interested in investigating the measurement of the student service satisfaction index using the HEISQUAL dimension combined with the American Customer Satisfaction Index (ACSI) measurement method, as well as determining the order of priority improvements to service quality indicators that need to be improved through a combination of the Importance Performance Analysis (IPA) and Potential Gain Customer Value (PGCV) methods. ACSI is a development of the Customer Satisfaction Index (CSI) method, taking into account the value of expectations, performance and satisfaction so that the predictive level of this method is more accurate compared to other satisfaction index measurement methods (Hsu, 2008). Meanwhile, the combination of the IPA and PGCV methods is used to accurately determine the ranking of indicators for each dimension of HE service quality which is a priority for improvement (Nugraha et al., 2019; Wahyudin et al., 2023).

Literature Review

### Development of The Service Satisfaction Measurement Scale in HE

Satisfaction and service quality are two fundamentally different concepts but positively correlated (Galeeva, 2016). Quality services in HE will lead to satisfaction in students so that they are more motivated to take part in the learning process (Jupiter et al., 2017; Mahmood et al., 2014). Grönroos (1984) is an academic who first introduced the concept of measuring service satisfaction by comparing expected and perceived service. This concept became the basis for Parasuraman et al. (1985) to develop the most popular measurement scale among organizations and researchers to measure service satisfaction in various industries, namely SERVQUAL. Then many researchers adopted this dimension to measure student satisfaction with the quality of services provided by HE (Calvo-Porral et al., 2013; Ezeokoli & Ayodele, 2014; Sultan & Yin Wong, 2010). However, this led to many criticisms from other researchers who proved that SERVQUAL was empirically irrelevant for use in HE (Brochado, 2009; Frazer Winsted, 2000; O'Neill & Palmer, 2004; Trivellas & Dargenidou, 2009).

Several academics then developed instruments to measure the quality of HE services with various dimensions that differ from one another, such as SERVPERF (Cronin & Taylor, 1992), HEdPERF (Abdullah, 2006), Education Quality (EduQUAL) (Mahapatra & Khan, 2007), EDUSERVE (Ramseook-Munhurrun et al., 2010), SQM-HEI (Senthilkumar & Arulraj, 2011), HESQUAL (Teeroovengadum et al., 2016). Some literature has proven that these instruments still have drawbacks. Although HedPERF is proven to be more valid and reliable than SERVPERF, the instrument does not yet cover the technical aspects of measuring service quality (Brochado, 2009). EduQUAL is only relevant to measure service quality in technical schools, SQM-HEI is specific to higher education in India, while EDUSERVE is only relevant to secondary schools (Ibrahim et al., 2012; Mattah et al., 2018). The HESQUAL model Teeroovengadum et al. (2016) developed is indeed more complex than previous models. However, this model is considered not precise enough and needs to be developed in technical, operational and cultural aspects (Abbas & Sagsan, 2020; Latif et al., 2017; Rafik & Priyono, 2018). This is the basis of Abbas's study (2020a) to develop the HEISQUAL model by completing the technical and operational dimensions and Asnawi and Setyaningsih (2020) to develop the i-HESQUAL model by adding a cultural dimension. Until now, no literature has criticized the HEISQUAL model. This model is considered the most comprehensive and flexible to be applied in various HE types (Sultan & Yin Wong, 2010). Meanwhile, i-HESQUAL is only designed to be applied in the context of Islamic HE (Asnawi & Setyaningsih, 2020). This became the basis for the authors choosing to use the HEISQUAL scale to measure HE.

Synthesis of Service Satisfaction Measurement in HE

Measuring service satisfaction is part of a continuous improvement process to improve service to customers gradually from time to time (Singh & Singh, 2015). The service satisfaction referred to in this study is student satisfaction with the quality of service provided by HE. The measurement scale used in this study uses the HEISQUAL approach (Abbas, 2020a) which consists of seven dimensions, 16 sub-dimensions, and 63 indicators measuring the quality of service in HE as presented in Figure 1.

The determination of the student satisfaction index using the ACSI method (Fornell et al., 1996) has more precise predictive validity than other customer satisfaction measurement methods (Mao & James, 2020; Morgeson et al., 2023; Setiawan, 2014). Wang et al. (2023), Ji (2021), and Serenko (2011) proved that this method is more rational to use or operate and has a significant effect in the field of education compared to other measurement methods. The determination of the student service satisfaction index using this method is obtained based on the calculation of the weighted average value of performance, expectations, and perceived satisfaction. The weakness of this method is that it cannot determine which service quality indicators are a priority for improvement in order to increase student service satisfaction on an ongoing basis (Fornell et al., 1996; Morgeson et al., 2023).
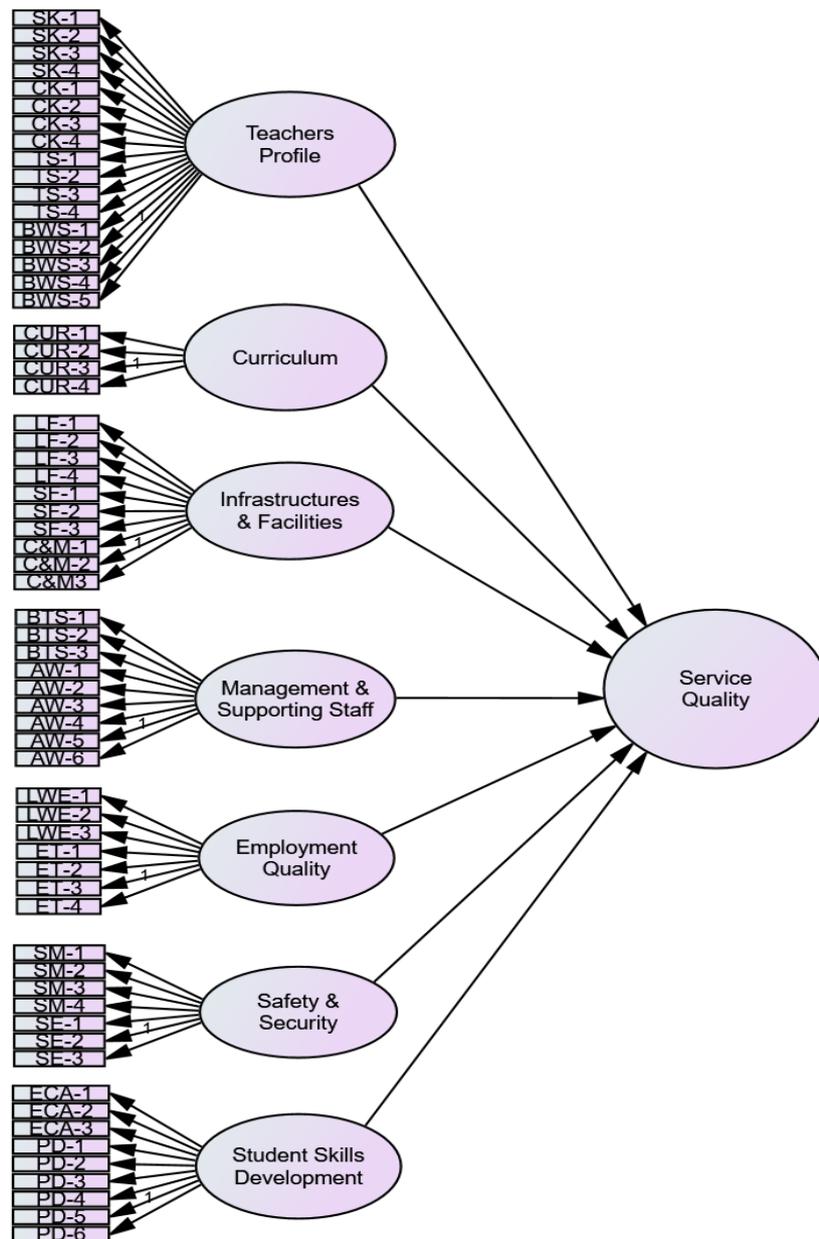
Figure 1. HEISQUAL Approach

ACSI Formula:

$$\text{ACSI} = \frac{\big((S-1) \times 0.3885\big) + \big((H-1) \times 0.3190\big) + \big((P-1) \times 0.2925\big)}{n-1} \times 100\%$$

N : Number of likert scale
S : Satisfied
H : Importance
P : Performance

Table 1. Service Satisfaction Level Criteria

Index	Criterion
0 – 20.99%	Not Satisfied
21 – 40.99%	Less Satisfied
41 – 60.99%	Quite Satisfied
61 – 80.99%	Satisfied
81 – 100%	Very Satisfied

Several researchers previously used IPA as a combined method in measuring student service satisfaction (Rizos et al., 2022). IPA is a matrix that maps indicators from each sub-dimensional service quality into four quadrants based on a comparison of student assessments regarding the expectations and performance of service quality provided by HE (Martilla & James, 2010). The indicators included in Quadrant A are the main priority that needs to be improved because the performance of the services provided by HE still needs to be higher than student expectations. Quadrant B describes that the performance of the indicators is in line with expectations, so it needs to be maintained. Quadrant C groups several indicators that are a low priority for improvement because they are considered less important and offset by the low performance of HE services. Quadrant D describes conditions where HE excessively provides quality services on indicators considered less important by students (Kim et al., 2021). Although simple, this method can identify the interests and benefits of each service quality indicator with strong precision (Pai et al., 2018; Sever, 2015). IPA can overcome ACSI's shortcomings because it can diagnose major weaknesses and determine service quality indicators that need to be improved (Dabestani et al., 2016).

IMPORTANCE	QUADRANT A "CONCENTRATE"	QUADRANT B "KEEP UP"
	QUADRANT C "LOW PRIORITY"	QUADRANT D "OVERKILL"
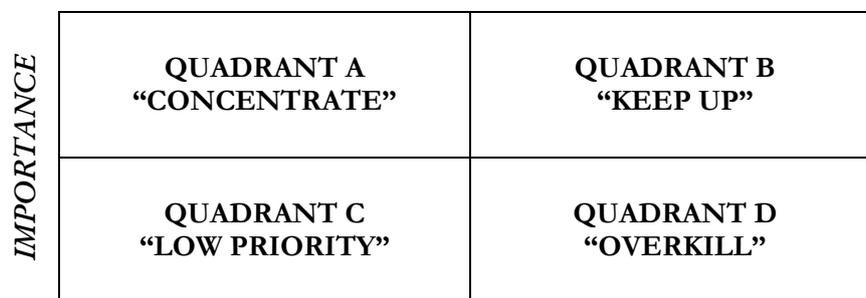
Figure 2. Cartesius Diagram of IPA

The weakness of the IPA method is that it has not been able to recommend a priority sequence of improvements to service quality indicators that need to be improved, so it needs to be supported by the PGCV method. PGCV is a quantitative measurement tool commonly used in customer satisfaction surveys to determine the order of priority for improvement in each indicator from the largest to the smallest PGCV value. PGCV is the difference between the Ultimately Desire Customer Value (UDCV) and the Achieve Customer Value (ACV). Where UDCV is the result of multiplying the average value of expectations with the maximum performance value, while ACV is the result of multiplying the average value of reality and expectations (Parasuraman, 1997; Woodruff, 1997). The IPA-PGCV integration is very appropriate in responding to the need for HE to identify which service indicators need to be improved and the order of priority in carrying out improvements to these indicators.

Research Methods

Sampling and Data Collection

This research design is in the form of a quantitative survey method of students studying at private universities spread across Central Java Province. The reason for choosing this unit of analysis is based on the finding by Truong et al. (2016) and Le et al. (2021), who obtained the result that most students at private tertiary institutions were dissatisfied with the quality of services provided. Central Java province has the highest number of registered students of all private HE in Indonesia (Indonesian Ministry of Higher Education and Culture, 2020). This study used primary data obtained through distributing questionnaires in the form of a Google Form to 350 respondents for four months (March – June 2023) who were selected based on a convenience sampling technique (non-probability sampling) for ease of filling out the questionnaire. The questionnaire rate that can be analyzed is 91.43 percent or as many as 320 respondents, so it is still greater than the minimum number recommended by Hair et al. , which is five times the 63 observation indicators or 315 respondents.

Measurement Dimension

The variable in this study is the quality of higher education services with the HEISQUAL approach adapted from Abbas (2020a). The dimensions measured in this variable consist of Teacher Profile (TP), Curriculum (C), Infrastructure & Facilities (IF), Management & Support Staff (MSS), Employment Quality (EQ), Safety & Security (SS), and Student Skills Development (SSD). All items were measured using a five-point Likert scale as suggested by Churchill et al. (2010) including satisfaction criteria with a range (1 = "very dissatisfied" to 5 = "very satisfied"), criteria related to expectations with a range (1 = "very unimportant" to 5 = "very important"), and performance-related criteria with a range (1 = "very poor" to 5 = "very good").

Data Analysis

The first step must be to ensure the construction of a good measurement scale through a pilot test as a reference in carrying out field tests using confirmatory factor analysis. After the measurement scale is declared suitable as a benchmark, the next step is to calculate the ACSI index to determine student satisfaction criteria, classify service quality indicators into IPA diagrams, and prioritize service quality indicator improvements based on the PGCV value.

Results and Discussion

Table 2. Respondents Demographic

Particulars	Categories	Frequency	(%)
Sex	Male	126	39.38
	Female	194	60.63
Students Age	<20	5	1.56
	20	163	50.94
	21	112	35.00
	22	23	7.19
	>23	17	5.31
Students Level	Bachelor	280	87.50
	Master	35	10.94
	Doctor	5	1.56
HE Accreditation	A/Excellent	52	16.25
	B/Very well	234	73.13
	C/Good	34	10.63

Table 2 shows that the distribution of respondents in this study was more dominated by women than men with a ratio of 60.63%:39.38%. Meanwhile based on age group, the most respondents were in the 20 years old age category, namely 35% and the least in the <20 years old age category, namely 1.56%. Based on a particular students level, respondents were dominated by Bachelors degree, namely 87.50%. Meanwhile, based on HE accreditation, the majority of respondents came from HE accredited B/Very well at 73.13%.

Measurement Model

The data in Table 3 and Table 4 show that the measurement scale used to measure latent variable indicators meets convergent and discriminant validity and construct reliability criteria. Fulfillment of convergent validity criteria is evidenced by the factor loading value of each item ≥0.5 and average variance extract (AVE) >0.5 (Table 3), which means that all of these indicators can explain constructs greater than 50 percent. The fulfillment of the discriminant validity criteria can be seen in Table 4 that the AVE square root value of all constructs is higher than the correlation value. Meanwhile, the fulfillment of construct reliability criteria can be seen from the CR value of each construct > 0.6 (Table 3) (Chin, 1998; Fornell & Larcker, 1981; Hair et al., 2010).

Table 3. Convergent Validity and Reliability Testing Results

Construct	Sub-Construct	Items	Factor Loading	AVE	CR
Teacher's Profile (TP)	Subject Knowledge (SK)	4	0.505 – 0.824	0.702	0.843
	Communication Skills (CK)	4	0.612 – 0.813		
	Teaching Style (TS)	4	0.602 – 0.821		
	Behaviour with Students (BWS)	5	0.622 – 0.843		
Curriculum (C)	Curriculum Quality (CUR)	4	0.658 – 0.907	0.678	0.814
Infrastructure & Facilities (IF)	Learning Facilities (LF)	4	0.545 – 0.786	0.653	0.839
	Supportive Facilities (SF)	3	0.522 – 0.782		
	Cleanliness & Maintenance (C&M)	3	0.682 – 0.876		
Management & Support Staff (MSS)	Behaviour with Student (BTS)	3	0.506 – 0.721	0.624	0.822
	Administrative Work (AW)	6	0.655 – 0.846		
Employment Quality (EQ)	Links with Employers (LWE)	3	0.805 – 0.885	0.714	0.860
	Employability Training (ET)	4	0.765 – 0.836		
Safety & Security (SS)	Security Measures(SM)	4	0.860 – 0.954	0.636	0.806
	Safety Equipment (SE)	3	0.822 – 0.924		
Student's Skills Development (SSD)	Extra-Curricular Activities (ECA)	3	0.654 – 0.887	0.721	0.845
	Personal Development (PD)	6	0.662 – 0.849		

Table 4. Discriminant Validity Testing Results

Dimensions	TP	C	IF	MSS	EQ	SS	SSD
Teacher's Profile (TP)	**0.820**						
Curriculum (C)	0.487	**0.770**					
Infrastructure & Facilities (IF)	–0.192	0.140	**0.832**				
Management & Support Staff (MSS)	0.360	0.563	0.525	**0.757**			
Employment Quality (EQ)	0.464	0.410	0.207	0.388	**0.824**		
Safety & Security (SS)	0.093	0.162	–0.187	–0.077	0.523	**0.729**	
Student's Skills Development (SSD)	0.107	–0.041	0.448	0.186	0.442	–0.122	**0.782**

Student Satisfaction Index Based on The ACSI Method

Determining student satisfaction with the quality of HE services using the ACSI measurement method, which includes the average value of expectations, performance, and satisfaction. The results of the recapitulation of measuring the level of student service satisfaction based on the ACSI method are presented in Table 5.

**Table 5**. Student Satisfaction Criteria

Sub Dimensions	Importance	Performance	Satisfied	ACSI (%)	Criteria
SK	4.64	3.43	3.56	71.61	Satisfied
CK	4.73	3.15	3.23	67.12	Satisfied
TS	4.70	3.42	3.54	71.81	Satisfied
BWS	4.72	3.16	3.30	67.82	Satisfied
CUR	4.44	3.48	3.61	70.96	Satisfied
LF	4.75	2.65	2.72	58.68	Quite Satisfied
SF	4.61	2.92	3.04	62.64	Satisfied
C&M	4.73	2.94	3.06	63.94	Satisfied
BTS	4.77	3.10	3.18	66.65	Satisfied
AW	4.64	3.20	3.35	67.93	Satisfied
LWE	4.84	2.66	2.78	59.99	Quite Satisfied
ET	4.82	2.92	3.06	64.43	Satisfied
SM	4.17	3.39	3.54	67.39	Satisfied
SE	4.34	3.39	3.57	69.08	Satisfied
ECA	4.65	2.72	2.82	59.36	Quite Satisfied
PD	4.55	3.21	3.32	66.96	Satisfied
Average	4.63	3.11	3.23	66.02	Satisfied

Based on the research data presented in Table 5, it can be seen that the HEISQUAL satisfaction score is 66.02%, which means that overall, students are satisfied with the services provided by HE. However, what HE managers should pay attention to is that three sub-dimensions are in the quite satisfied category, namely learning facilities, relations with industry, and student extracurricular activities. The three service sub-dimensions have performance and satisfaction values that are quite low compared to the expected values given by students.

Learning facilities are one of the service attributes that have a significant and positive influence on the level of student satisfaction (Dora, 2017; Napitupulu et al., 2018; Noor & Tanzil, 2020; Ishak & Abdulahsani, 2018; Wijaya et al., 2023). Indicators that have low scores on the learning facilities sub-dimensions are library resources (such as access to reputable national and international journals, representative reading rooms, and well-maintained furniture), the availability of tools and equipment that support learning (such as the internet and air conditioning in classes must be in good condition), as well as the ratio of the number of students per class which is considered too high.

Relations with the employment or industry are a top priority for HE to become the flagship program offered to students (Qureshi et al., 2021; Grotkowska et al., 2015). This sub-dimension is also the factor that significantly influences student decisions in choosing HE (Diamond et al., 2012; Fulgence, 2015). All indicators in this sub-dimension get low performance and satisfaction scores. Students consider that HE still does not have strong relationships with industry, is not optimal enough to help students find jobs, and does not routinely hold interaction events with graduate users.

Extracurricular activities are a medium for channeling talents, interests, and hobbies possessed by students. Student satisfaction will increase if HE can provide support through adequate facilities, optimal financial and non-financial, and organizing regular or routine extracurricular activities (Han & Kwon, 2018; Muscalu & Dumitrascu, 2014; Bakoban & Aljarallah, 2015). Students consider that the three forms of support HE provides still need to be higher. Thus, it is necessary to make efforts for HE managers to increase the availability of adequate recreational and sports facilities, increase the budget for student activities and facilitate the administrative process of student activities, as well optimize the role of student organizations (ORMAWA) in carrying out student activities regularly.
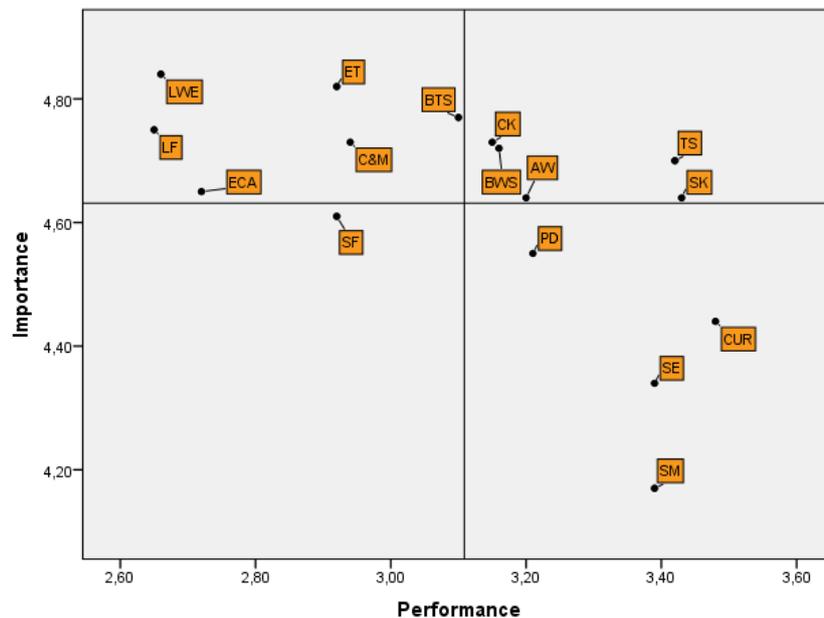
Figure 3. Results of Sub-Dimensional Grouping with IPA

Based on Figure 3, it can be seen that the 16 HEISQUAL sub-dimensions are divided into four quadrants with the following details.
1. Quadrant A – Concentrate Here
    All HEISQUAL sub-dimensions that are included in quadrant A are the top priority for improvement by HE managers because service performance has a low score or has not satisfied

students while student expectations in this sub-dimension are high. Six sub dimensions fall into this category, namely FL, C&M, BTS, LWE, ET, and ECA.

The FL, LWE, and ECA subdimensions have the lowest ACSI scores or are in the criteria of being quite satisfactory. However, based on the IPA method, there are three other sub-dimensions which are the top priority for improvement, namely the C&M, BTS, and ET sub-attributes. Although these three sub-dimensions are considered satisfied based on ACSI calculations, the gap between student expectations and the service performance provided by these three sub-dimensions is quite high, so they are included in the top priority quadrant for improvement.

HE administrators must ensure that the classrooms and campus environment are always clean and tidy because cleanliness and maintenance of lecture halls are non-spatial factors that have an influence on student satisfaction (Kärnä & Julin, 2015; Hill & Kathryn, 2010; Sapri & Finch, 2009). HE managers and educational staff must also be able to improve excellent service to students, especially in academic and non-academic matters fairly and equitably to increase the level of student satisfaction (Neary, 2016; Sitanggang et al., 2021).

Indicators of ET that have quite high performance and satisfaction scores are that HE has a good reputation in the industry and is easy to get a job. However, two other indicators, namely active job placement services and work seminars for students, have low-performance ratings and satisfaction. So that there needs to be an effort from HE managers to be able to form a special unit that functions to assist students in obtaining work placements and job training or apprenticeships in the industry, including at school, so that it can not only increase student satisfaction with services at ET (Bordean & Sonea, 2018; Kaban & Augustinus, 2022; Liu et al., 2023), however, it can also contribute to increasing the achievement of Key Performance Indicators (IKU) of HE.

2. Quadrant B – Keep Up
All sub-dimensions included in quadrant B are sub-dimensions with high expectations and performance values. There are five sub-dimensions that fall into this category, namely SK, CK, TS, BWS, and AW. The results of this study indicate that respondents considered that the performance of all lecturer profiles was close to what was expected. However, what is of concern is that CK is very close to Quadrant A, meaning that special efforts are needed for HE managers so that CK remains in Quadrant B through routine teaching communication skills training for lecturers so that lecturers can be more communicative and courteous towards students in class and can convey material and task instructions are better and easily understood by students. Overall student satisfaction with the services provided to HE is largely determined by the communication skills of lecturers and students (EminaTerzić & AmnaAščić, 2018).

3. Quadrant C – Low Priority
All sub-dimensions that fall into this category are not a priority for HE managers because the student's expected value is not high enough while the performance given also has a low rating. There is only one HEISQUAL sub dimension that falls into this category, namely SF. Based on the data presented in Figure 3, it is known that SF is in the line of intersection with Quadrant A. This means that supporting facilities have the potential to become a sub-dimension that has a high expectation value for students in the future. Thus, there needs to be an effort to anticipate HE managers so that SF does not shift to Quadrant A, but shifts to Quadrant B. Efforts that can be made include increasing the availability of transportation services, cafeterias, flats, as well as other lecture support goods and services with competitive prices and quality or rational (Teeroovengadum et al., 2016).

4. Quadrant D – Overkill
Some of the sub-dimensions that fall into this quadrant are categorized as sub-dimensions that get excessive treatment because students consider these sub-dimensions not too important but

HE has provided high performance. There are four sub-dimensions that fall into this category, namely CUR, SM, SE, and PD.

Service Quality Improvement Priority Sequence

Determination of priority improvements to the service quality sub-dimensions that must be carried out by HE managers using the PGCV method can be seen in Table 6 below.

Table 6. Ranking of Service Quality Improvement Priorities

Sub Dimensions	ACV	MAKS	UDCV	PGCV	Ranking
ET	12.8040	5	24.2500	11.4460	1
LWE	12.8583	5	24.2000	11.3417	2
LF	13.0625	5	23.7500	10.6875	3
ECA	12.6480	5	23.2500	10.6020	4
C&M	13.3480	5	23.6667	10.3187	5
BTS	14.7973	5	23.8667	9.06933	6
SF	12.4242	5	21.2500	8.82583	7
CK	14.9074	5	23.6625	8.75513	8
BWS	14.9089	5	23.6200	8.71106	9
AW	14.8611	5	23.2083	8.34726	10
PD	14.5873	5	22.7500	8.16270	11
TS	16.0623	5	23.5000	7.43775	12
SK	15.9152	5	23.2000	7.28480	13
SE	14.6981	5	21.7000	7.00187	14
CUR	15.4710	5	22.2125	6.74149	15
SM	14.1174	5	20.8375	6.72009	16

Based on the calculation results of the PGCV values presented in Table 6, it can be seen that there are 6 sub-dimensions which are the main priorities that need to be improved in service quality performance by HE managers, namely 1) relations with industry, 2) learning facilities, 3) student extracurricular activities, 4) employment training, 5) cleanliness and maintenance of school buildings, and 6) behaviour with student management & support staff.

Implication and Conclusion

The empirical results show that HEISQUAL is a fit model to measure the quality of HE services. Thus, the results of this study can confirm that the HEISQUAL model can be used as an alternative measurement of service satisfaction at HE. In addition, this study also expands the existing literature through the use of the ACSI method in determining the service satisfaction index, which is combined with the IPA and PGCV methods to classify HE service quality indicators which are the top priority for improvement in a definite order. The results of this study recommend that HE managers pay attention to the HEISQUAL dimension as an important instrument in increasing competitive advantage and meeting customer expectations. Although the resulting ACSI index is 66.02% or is in the satisfied category, improvements are needed in 6 sub-dimensions in the order: 1) ET, 2) LWE, 3) LF, 4) ECA, 5) C&M, 6) BTS.

The limitations of this study are that the respondents used were only limited to private HE students in Central Java Province and used convenience sampling so they were not sufficiently representative of the student population in Indonesia. For future researchers, it is necessary to expand the respondents to a wider scale using a longitudinal study with a larger geographic sample so that the results can be generalized. In addition, future researchers should also compare HEISQUAL with other service quality dimensions such as SERVQUAL, HEdPERF, and HESQUAL to prove the best model to be implemented in HE, as well as add a cultural dimension to service quality measurement.

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