

Disentangling Important Factors in Service Quality: An Empirical Study in Vocational Higher Education at Bandung City

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ABSTRACT

The purpose of this study, which is to reveal a comprehensive picture of the quality of these services in the data obtained from the evaluation of service quality from the perspective of its main users, namely students. This study was conducted using a quantitative method with a confirmatory factor analysis approach with a cross-sectional design. The proposed model is based on a current conceptualization of service quality, which suggests that service quality is a multidimensional and hierarchical construct. The validity value of the factor model shows good results so that the quality of higher education services can be reflected in nine aspects, namely (1) educational facilities, (2) reliability, (3) responsiveness, (4) empathy, (5) academic services information systems, (6) general facilities & infrastructure, (7) students' interests and activities, (8) library services, and (9) financial services. The results of the study reveal that responsiveness is the factor that best reflects service quality in higher education. While the score for general facilities and infrastructure is the aspect that is rated the lowest, especially on the factor regarding cleanliness in toilets and public facilities. The paper has value for the higher educational institute (HEI) seeking to improve the quality of services they provide.

Keywords: Service Quality, Higher Educational Institution, Confirmatory Factor Analysis.



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INTRODUCTION

The current era of globalization raises new challenges for the academic environment. Universities are required to produce superior and quality human resources following the demands of development which also play a role in mastering, utilizing, and developing science and technology. The ability of tertiary institutions to utilize and develop science and technology is a competitive strength in competing with other tertiary institutions. One of the most important stakeholders of tertiary institutions is students as external stakeholders who have an interest in accessing higher education services. Managing quality services in higher education is a challenge for universities. This relates to efforts to meet standards that show how qualified an organization is

to encourage an increase in reputation for stakeholders. In some previous literature, the quality of service from tertiary institutions has been seen as important to encourage student satisfaction (Bahri, 2020; Epriliyana et al., 2021).

As a form of organization that provides services to the public, universities should try to improve their services properly which leads to the satisfaction of its users. Service user satisfaction is the most important form as result of quality service and applies to various types of organizations (Novira et al., 2020; Pramuditha, 2021; Sulistyan et al., 2017; Zulvia & Haryanto, 2021). The study of services for the public is inseparable from the actors who play a role in the process of delivering these services, where motivation in serving the public from individuals who work in organizations is important in any situation (Agustina et al., 2021).

Settings in academic or instructional terms have proven to be the most difficult areas to implement, while more success has been shown in administrative and ancillary services settings. This condition is a challenge in the management of higher education institutions in providing added value and greater benefits for stakeholders. The higher education sector has begun to adapt the concept and methodology of total quality management. A customer-oriented quality approach is a basic requirement of this philosophy. This is reinforced by the consideration that service quality is generally subjective, unlike product quality which can be measured objectively (Jain et al., 2011).

For some time, universities have preferred to focus on internal academic needs rather than seeing students as their main customers (Sharabi, 2013). Universities need to manage efforts that focus on students because higher education organizations can use strategic marketing elements to build good customer relationship management with students as the main customer (Sulistyan et al., 2017). This attitude has helped universities create greater demand than supply. The shift in the tertiary market from the supplier market (where there is less supply than demand and suppliers determine quality) to the customer market (where there is higher supply than demand and customers dictate quality) has increased competition between academics. institution. Therefore the competition to get prospective students is becoming increasingly challenging (Sharabi, 2013).

In the last two decades, more universities and colleges (virtual and real) have been established in response to the growing demand for Higher Education and many customers wishing to study abroad. Therefore, higher education institutions need to guarantee service quality standards to sustain the market in which they operate. These institutions are now considered profitable organizational service centers, which can drive market segmentation and targeting based on quality dimensions in the provision of higher education (Akareem & Hossain, 2016).

Previous literature has provided a deep understanding of the justification that a marketing approach in the higher education domain can provide strong results (Sultan & Wong, 2010), such as student satisfaction and retention (Audina & Jariah, 2017; Sulistyan et al., 2017). Another research such as Along et al., (2020) explained that two things are important for improving the quality of academic services, improving infrastructure and consistency in academic services. Sultan & Wong, (2019) underscores the importance of service quality felt by students in encouraging levels of trust and satisfaction and henceforth can increase the tendency to behave positively.

while empirical reviews on service quality have received a lot of attention and reviews from previous researchers. Service quality can be reviewed by various types of organizations (Haryanto et al., 2021; Novira et al., 2020; Nuraini et al., 2021; Pradesa et al., 2022; Pramuditha & Agustina, 2022; Zulvia & Haryanto, 2021), and of course no exception in higher education organizations (Along et al., 2020; Silva et al., 2017; Sulistyan et al., 2017; Teeroovengadum et al., 2016). However, in general, the most important thing is that service quality is generally recognized as the basis for evaluating performance in a service provider organization.

Although the application of the SERVQUAL and SERVPERF scales to measure different service quality was found to achieve some degree of success, the general applicability of the models is still questionable. When replicated to evaluate the quality of service at tertiary institutions perceived by students, studies on service quality show that there are still unresolved questions, especially related to the most appropriate measurement instrument for evaluating each type of service (Abdullah, 2005). Therefore, the same author created a new measurement scale based on the SERVPERF scale, which also takes into account specific determinants of service quality in tertiary institutions, named HEdPERF (Higher Education Performance). The purpose of this study is to describe what are the most important factors that can be reflected in the quality of service in tertiary institutions. This research is also to measure the quality of service perceived from the perspective of students at the college.

While students of a higher education institution may be the most obvious customer, many other stakeholders also serve as customers for various areas of operation within higher education such as graduate user agencies, the government, and society in general. Understanding quality from an educational environmental perspective is very different from the quality techniques of the typical customer-focused industry, but higher education settings make customer focus more difficult than in other types of industries (Quinn et al., 2009).

According to the SERVQUAL scale, quality is perception minus expectation. Initially, the concept of service quality had five dimensions and 22 items (Parasuraman et al., 1988). In this study, service quality was developed into 7 dimensions with 34 items. The dimensions of the quality of higher education services include (1) educational facilities, (2) reliability of educational services, (3) responsiveness of services, (4) treatment, (5) service and convenience of academic information systems, (6) facilities, facilities and infrastructure, and (7) student interests and activities.

METHODS

The scope of the survey on the perceptions of students about the service quality at Polytechnic X in the city of Bandung is related to the business processes carried out by the organization. The sampling method used in this study is a non-probability sampling method. The choice of this method is due to the relatively heterogeneous population of Polytechnic students seen from the Study Program the students come from. So subpopulations (strata) are formed based on relatively homogeneous categories. Sampling from each subpopulation (strata) was carried out by the convenience sampling method through a disproportionate composition. A survey on the quality of services provided by Polytechnic X in Bandung City will be conducted for all study programs in 2022. The research design is cross-sectional, with data collection at one time only. The data collected is in the form of primary data obtained from the answers of respondents, namely students at Polytechnic X in the city of Bandung.

The research design includes details of the central proposition or research questions to be answered, units of analysis, and procedures for collecting and analyzing data. The research design for this research is a master plan detailing the methods and procedures for collecting and analyzing customer perceptions about the quality of vocational higher education services. The deductive paradigm is the basis for using quantitative research methods requiring sample data collection involving several respondents using research instruments that measure research objectives and propositions. This study used a survey questionnaire adapted from the service quality instrument to collect data. Customer perception surveys are based on quantitative research methods that collect data for analysis in an attempt to prove or disprove predetermined propositions. The main objective of this study is to determine the extent to which perceptions are formed on the service quality of Polytechnic X in the city of Bandung.

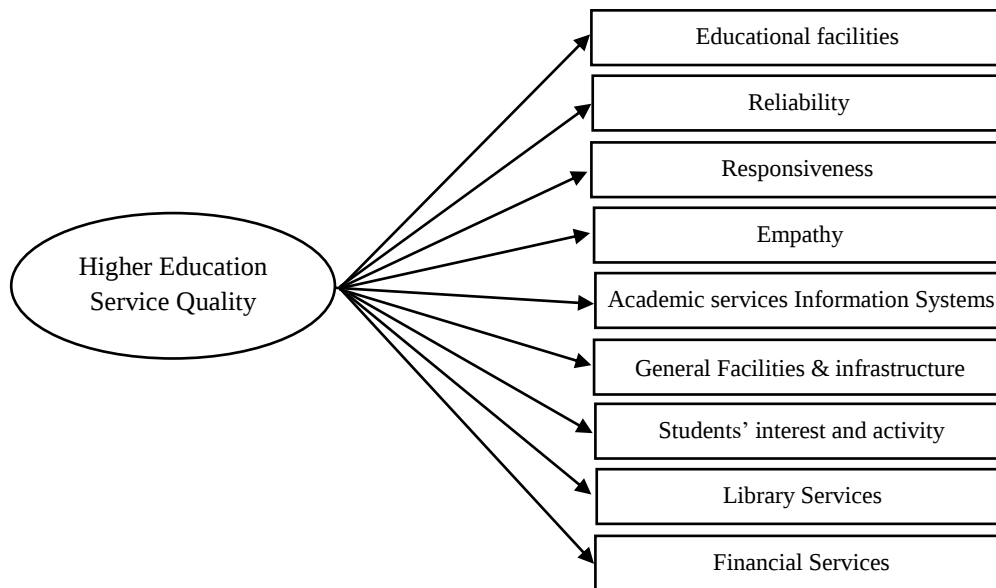


Figure 1. Conceptual Framework

In this research data analysis techniques using descriptive research with a quantitative approach. The measurement instrument developed is a service quality instrument that students perceive of service which consists of 9 dimensions with a total of 44 statements. This number is divided into 5 statements to assess educational facilities, 6 statements to assess reliability, 4 statements to assess responsiveness, 5 statements to assess treatment, 4 statements to assess aspects of service and convenience of academic information systems, 4 statements to assess aspects of facilities, facilities infrastructure, as well as 6 statements to assess aspects of understanding the interests and activities of students. Then there are 5 statements each on aspects of library services and financial services. The value of the statements in this questionnaire instrument consists of statements in the value interval 1 – 4, concerning the standard community satisfaction index in public organizations.

The basis for setting standards in the Evaluation of Service Satisfaction refers to the Guidelines for Compiling the Public Satisfaction Index (IKM) based on the Decree of the Minister of Administrative Reform No. 25 of 2004. Based on the provisions of the Main Performance Indicator target for the user or community satisfaction (including customer satisfaction) from tertiary institutions as mandated is a minimum of 80, which converts this target into a minimum value of 3.2 on a scale of 1 – 4. To determine service quality it is necessary to categorize by converting the IKM value that has been obtained. Because there are 4 categories of answers to the questionnaire, the conversion of the IKM value is obtained through the categorization of service quality.

Data collection can produce a group of data that needs to be recapitulated and tabulated in the form of raw data. The data that has been collected is then processed and tested for validity and reliability. After testing the validity and reliability, the data analysis technique in the form of a two-stage confirmatory factor analysis was carried out to obtain the factor weight values of the indicators for each construct, as well as the factor weight values of each construct on the variable (quality of service in tertiary institutions). The significance criterion used in this study is five percent or it must be below 0.05. The calculated factor weight values must meet the significance level to be declared significant in reflecting the constructs observed in this study.

RESULTS AND DISCUSSION

Data was successfully collected over two months, from July to August 2022. The research respondents were students who were active at a vocational college in the city of Bandung. Table 1 below shows the identification of the characteristics of the 241 respondents who were categorized based on their respective gender and department.

Table 1. Personal Characteristics of the Respondents

Sex	n	Percentage
Male	74	30.7
Female	167	69.3
Total	241	100.0
Department	n	Percentage
Department of State Development Administration	70	29.0
Department of Public Sector Business Administration	55	22.8
Department of Human Resource Management Apparatus	108	44.8
Department of Post Graduate – State Development Administration	8	3.3
Total	241	100.0

Source: Data Processed (2022)

Based on Table 1, it is known that the majority of respondents in this survey, namely around 69.3%, consisted of female students and the rest were male students. This is also supported by data from students at Polytechnic X in the city of Bandung, which is dominated by women on average. In filling out this survey, students from all study programs were also involved, with most coming from the Department of Human Resource Management Apparatus Study Program, which was around 44.8% of the total number of students who were respondents in this survey. However, only a small portion of the Post Graduate study programs contributed in expressing opinions regarding the academic services provided, namely only around 3.3% of the 241 people who filled out the survey.

Furthermore, the results of data processing are presented in a concise table. The following tables discuss the correlation coefficient values, mean values, and factor weight values for each construct observed in this study. Presenting the following table briefly makes it easier to interpret each of the findings that were revealed in this study.

Table 2. Validity Test Results, Factor Weights, MSA and Mean Score for Educational Facilities

Indicator	r	Loading Factor	MSA	Mean
The classrooms are clean, comfortable, and neat	0.429	0.630	0.772	3.31
The learning facilities in the classroom are quite adequate	0.631	0.807	0.731	3.11
The laboratories are relevant to scientific needs	0.535	0.734	0.797	3.03
The library facilities are quite good	0.494	0.699	0.794	3.18
The online learning system developed is relevant and sufficient	0.443	0.638	0.840	3.21

Source: Data Processed (2022)

Table 2 shows that the value of the correlation coefficient for each indicator of the educational facilities construct was found to be in the range of 0.429 to 0.631. The overall value is above the value of 0.3, which means that all indicators of educational facilities can be declared valid or valid. Then the mean value of each indicator was found to be in the value range of 3.03 to 3.31 so that a mean value for the educational facilities construct of 3.2 can be obtained. This means that the

aspects of educational facilities in service at vocational tertiary institutions in the city of Bandung are perceived in the good category by students.

The KMO and Bartlett's Test scores for the educational facilities aspect show the KMO MSA score of 0.779 (which is still greater than 0.50). While the value of Bartlett's Test of Sphericity shows a sign of 0.000 (<0.05). These results indicate that the factor analysis for the educational facilities aspect can be continued because it meets the KMO MSA criteria and Bartlett's Test. Meanwhile, the Measure of Sampling Adequacy (MSA) value for all the indicators studied on the aspects of assurance and trust is > 0.50 , so the minimum MSA scores requirements have been met. Factor weights for all aspects of assurance and trust were found to be in the range of 0.630 to 0.807, all of which correlated with the established factors. All existing indicators can also explain factors because the extraction value is $> 50\%$. This dimension of educational facilities is best reflected by the indicator the learning facilities in the classroom are quite adequate at 0.652. This indicator is the one with the largest loading factor weight compared to other indicators in the educational facilities dimension.

Table 3. Validity Test Results, Factor Weights, MSA and Mean Score for Reliability

Indicator	r	Loading Factor	MSA	Mean
Lecturers provide lecture material clearly	0.649	0.768	0.899	3.15
Lecturers allocate time for discussion and question and answer in learning activities	0.633	0.750	0.903	3.27
Lecturers provide teaching materials (supplements) to complement the material provided	0.720	0.820	0.866	3.17
Lecturers always come on time for learning activities	0.553	0.676	0.914	3.00
The teaching staff is classified as skilled and able to serve the interests of students well.	0.731	0.835	0.844	3.17
The educational staff serves the interests of students well and politely.	0.671	0.786	0.863	3.17

Source: Data Processed (2022)

Table 3 shows that the value of the correlation coefficient for each indicator of the responsiveness construct was found to be in the range of 0.553 to 0.731. All of these values are above the value of 0.3, which means that all indicators of responsiveness can be declared valid or valid. If seen the mean value derived from each indicator is in the range of 3.00 to 3.27 where it is concluded that the average responsiveness construct is 3.16. This shows that the responsiveness aspect of Polytechnic X Vocational Higher Education services in the city of Bandung is perceived in the medium category by students. The priority that must be considered in this aspect of responsiveness is the Lecturers always coming on time in learning activities indicator with the smallest average among the other indicators, namely 3.00. The KMO and Bartlett's Test values for the responsiveness aspect show the KMO MSA value of 0.877 (a value greater than 0.50). While the value of Bartlett's Test of Sphericity shows a sign of 0.000 (<0.05). These results indicate that the factor analysis for the responsiveness aspect meets the criteria in the KMO MSA criteria and Bartlett's Test. Meanwhile, the Measure of Sampling Adequacy (MSA) value for all the indicators studied on the responsiveness aspect is > 0.50 , so the minimum MSA scores requirements have been met. Factor weights for all aspects of assurance and trust were found to be in the range of 0.676 to 0.835, all of which correlated with the established factors. All existing indicators can also explain factors because the extraction value is $> 50\%$. Based on the factor weight values of each indicator, the responsiveness aspect that is most maintained on the Lecturer providing teaching materials (supplements) to complement the material provided indicator is feasible, namely contributing 0.672.

Table 4. Validity Test Results, Factor Weights, MSA and Mean Score for Responsiveness

Indicator	r	Loading Factor	MSA	Mean
Lecturers can become good academic advisors for students	0.641	0.805	0.812	3.25
Academic guidance services (assignment consultations, exams, work practices, final assignments) are carried out well by the lecturers	0.716	0.855	0.768	3.13
Learning evaluation activities (exams) are carried out in a timely and effective manner	0.667	0.823	0.803	3.15
Learning activities according to the time allocation that has been planned properly	0.617	0.783	0.843	3.17

Source: Data Processed (2022)

The correlation coefficient values, factor weight values, and the mean from the Responsiveness aspect are shown in Table 4. The correlation coefficient values for each indicator from the Responsiveness aspect were found to be in the value range of 0.617 to 0.716. All of these values are above the value of 0.3, which means that all indicators of Responsiveness can be declared valid or valid. Then the mean value of each indicator was found to be in the value range of 3.13 to 3.25 so that a mean value for the price construct of 3.17 can be obtained. This means that the price aspect of Polytechnic X vocational higher education services in the city of Bandung is perceived in the medium category by students. If we look at the average indicators in this aspect, the priorities for improvement in Academic guidance services (assignment consultations, exams, work practices, final assignments) are carried out well by the lecturers. In the results of the factor analysis for the Responsiveness aspect, it was found that the KMO and Bartlett's Test values for the guarantee and trust aspects showed a KMO MSA value of 0.803 (still greater than 0.50). While the value of Bartlett's Test of Sphericity shows a sign of 0.000 (<0.05). These results indicate that the factor analysis for the Responsiveness aspect can be continued because it meets the KMO MSA criteria and Bartlett's Test. Meanwhile, the Measure of Sampling Adequacy (MSA) value for all indicators studied in the Responsiveness aspect is > 0.50 , so the minimum MSA scores requirements have been met. Factor weights on all aspects of assurance and trust were found to be in the range of 0.783 to 0.855, all of which correlated with the formed factors. All existing indicators can also explain factors because the extraction value is $> 50\%$. When viewed from the value of the largest factor weight for the Responsiveness aspect, the contradiction with the average obtained on the Academic guidance services indicator (assignment consultations, exams, work practices, final assignments) is carried out well by the lecturers, where the weight given is 0.731 while the average is only 3.13 which is the lowest compared to other indicators. It can be concluded that these indicators provide the highest contribution, but the services must be considered in efforts to increase Responsiveness.

Table 5. Validity Test Results, Factor Weights, MSA and Mean Score for Empathy

Indicator	r	Loading Factor	MSA	Mean
Counseling assistance for students is provided by the campus	0.631	0.781	0.830	2.93
Awards are given to students who excel well	0.549	0.710	0.790	3.02
There are strict sanctions for the academic community who violate the rules or code of ethics that have been established and apply without exception	0.594	0.750	0.815	3.09
Lecturers are friendly and friendly to students	0.600	0.758	0.729	3.24
Lecturers are fair to students in learning activities (including learning processes and evaluations)	0.621	0.775	0.727	3.12

Source: Data Processed (2022)

The correlation coefficient values, factor weight values, and the mean for the empathy aspect are shown in Table 5. The correlation coefficient values for each indicator for the empathy aspect were found to be in the range of 0.549 to 0.631. All of these values are above the value of 0.3,

which means that all indicators from the empathy aspect can be declared valid or valid. Then the mean value of each indicator was found to be in the value range of 2.93 to 3.24 so that a mean value for the empathy aspect of 3.08 can be obtained. This means that the empathy aspect of Polytechnic X Vocational Higher Education services in the city of Bandung is perceived in the medium category by students. In this aspect of empathy, the results of the factor analysis showed that the value of KMO and Bartlett's Test for the aspect of physical evidence found that the KMO MSA value was 0.775 (still greater than 0.50). While the value of Bartlett's Test of Sphericity shows a sign of 0.000 (<0.05). These results indicate that the factor analysis for the empathy aspect can be continued because it meets the KMO MSA criteria and Bartlett's Test. Meanwhile, the Measure of Sampling Adequacy (MSA) value for all the indicators studied on the empathy aspect was found to be > 0.50 , so the minimum MSA scores requirements have been met. Factor weights on all aspects of assurance and trust were found to be in the range of 0.710 to 0.775, all of which correlated with the formed factors. All existing indicators can also explain factors because the extraction value is $> 50\%$. Based on calculations obtained by the empathy aspect with the indicator "Counseling assistance for students is provided by the campus" it produces the highest factor weight score but the lowest average is 2.93. This can be taken into account in improving the services provided to students must be considered again.

Table 6. Validity Test Results, Factor Weights, MSA and Mean Score for Academic Services Information System

Indicator	r	Loading Factor	MSA	Mean
The use of the system makes it easier for students to carry out academic activities and administration	0.760	0.855	0.771	3.20
Better academic activities and administration by using the academic system	0.823	0.896	0.781	3.18
Better academic services by using the system to fill in the study plan at the beginning of the semester	0.762	0.851	0.904	3.22
Better academic services use a system in supporting the Class Schedules	0.771	0.856	0.876	3.19
Academic services use a system in terms of supporting the Smoothness of Course Grades in each semester which has been carried out well	0.701	0.804	0.864	3.12

Source: Data Processed (2022)

Table 6 shows the results of calculating the correlation coefficient values, factor weight values, and the mean of the Academic Services Information System construct. The value of the correlation coefficient for each indicator of the reliability construct was found to be in the range of 0.701 to 0.823. All of these values are above the value of 0.3, which means that all indicators from the Academic Services Information System can be declared valid or valid. Then the mean value of each indicator was found to be in the value range of 3.12 to 3.22 so that a mean value for the Academic Services Information System aspect of 3.182 can be obtained. This means that the aspect of the Academic Services Information System in the vocational higher education services of Polytechnic X in the city of Bandung is perceived in the medium category by students. The results of the factor analysis for the Academic Services Information System aspect revealed that the KMO and Bartlett's Test values for the Academic Services Information System aspect found a KMO MSA value of 0.833 (still greater than 0.50). While the value of Bartlett's Test of Sphericity shows a sign of 0.000 (<0.05). These results indicate that the factor analysis for the Academic Services Information System aspect meets the KMO MSA criteria and Bartlett's Test. The Measure of Sampling Adequacy (MSA) value for all indicators studied in the Academic Services Information System aspect is > 0.50 , so the minimum MSA scores requirements have been met. Factor weights for all aspects of assurance and trust were found to be in the range of 0.804 to 0.896, all of which correlated with the established factors. All existing indicators can also explain factors because the extraction value is $> 50\%$. This means that aspects of the Academic Services Information System

of vocational higher education services can be reflected by the Smoothness of Course Grades in each semester which has been carried out well and needs to be taken into account. This aspect of the reliability of vocational higher education services is best reflected by better academic activities and administration by using the academic system with a factor weight of 0.803.

Table 7. Validity Test Results, Factor Weights, MSA and Mean Score for General Facilities & Infrastructure

Indicator	r	Loading Factor	MSA	Mean
Toilet facilities which are always clean and well maintained	0.515	0.717	0.802	2.86
Places of worship facilities that students can use adequately	0.455	0.656	0.861	3.19
On-campus facilities are relevant to the needs of student activities	0.738	0.888	0.637	2.95
The facilities used for student activities are adequate	0.626	0.827	0.654	2.95

Source: Data Processed (2022)

In the General Facilities & Infrastructure aspect, the results of calculating the correlation coefficient values, factor weight values, and the mean are shown in Table 7. The correlation coefficient values for each indicator from the General Facilities & Infrastructure aspect were found to be in the value range of 0.455 to 0.738. All of these values are above the value of 0.3, which means that all indicators from the General Facilities & Infrastructure aspect can be declared valid or valid. Then the mean value of each indicator was found to be in the value range of 2.86 to 3.19 so that a mean value for the General Facilities & Infrastructure aspect of 2.99 could be obtained. This means that the General Facilities & infrastructure aspects of the Vocational Higher Education services at Polytechnic X in Bandung City are perceived as being in the medium category by students. The results of the factor analysis for the General Facilities & Infrastructure aspect revealed that the KMO and Bartlett's Test values for the reliability aspect found that the KMO MSA value was 0.699 (still greater than 0.50). While the value of Bartlett's Test of Sphericity shows a sign of 0.000 (<0.05). These results indicate that the factor analysis for the General Facilities & infrastructure aspect meets the KMO MSA criteria and Bartlett's Test. The Measure of Sampling Adequacy (MSA) value for all indicators studied in the General Facilities & Infrastructure aspect is > 0.50, so the minimum MSA scores requirements have been met. Factor weights for all aspects of assurance and trust were found to be in the range of 0.656 to 0.888, all of which correlated with the established factors. All existing indicators can also explain factors because the extraction value is > 50%. When viewed from the aspects described previously, the General Facilities & infrastructure aspect has the lowest average. It can be concluded that this aspect should be of particular concern in the service of vocational higher education at Polytechnic X in the city of Bandung.

Table 8. Validity Test Results, Factor Weights, MSA and Mean Score for Students' interest and activity

Indicator	r	Loading Factor	MSA	Mean
Students' interests and talents are facilitated in their development	0.604	0.718	0.813	2.99
Monitoring and evaluation of student activities are carried out through coaches, companions, and the student affairs section	0.663	0.764	0.806	3.07
Officials, supervisors, or student assistants are willing to help students who experience difficulties in student activities	0.805	0.896	0.866	3.11
Officials, supervisors, or student assistants are friendly toward students	0.762	0.877	0.736	3.12
Officials, supervisors, or student assistants are friendly toward students	0.759	0.875	0.781	3.12

Source: Data Processed (2022)

From the Students' interest and activity aspect, the correlation coefficient values, factor weight values, and the mean are shown in Table 8. The correlation coefficient values for each indicator of the student's interest and activity aspect were found to be in the range of 0.604 to 0.805. All of these values are above the value of 0.3, which means that all indicators of reliability can be declared valid or valid. Then the mean value of each indicator was found to be in the value range of 2.99 to 3.12 so a mean value for the student's interest and activity aspect of 3.082 was obtained. This means that the student's interest and activity aspects in the vocational higher education services of Polytechnic X in the city of Bandung are perceived in the medium category by students. The results of the factor analysis for the student's interest and activity aspect revealed that the KMO and Bartlett's Test values for the student's interest and activity aspect found that the MSA KMO value was 0.797 (still greater than 0.50). While the value of Bartlett's Test of Sphericity shows a sign of 0.000 (<0.05). These results indicate that the factor analysis for the student's interest and activity aspect meets the KMO MSA criteria and Bartlett's Test. The Measure of Sampling Adequacy (MSA) value for all the indicators studied in the student's interest and activity aspect is > 0.50 , so the minimum MSA scores requirements have been met. Factor weights for all aspects of assurance and trust were found to be in the range of 0.718 to 0.896, all of which correlated with the established factors. All existing indicators can also explain factors because the extraction value is $> 50\%$. On the Indicator Students' interests and talents are facilitated in their development, and special attention is needed to improve services because from Table 8 it can be seen that the factor weight values and the average values are the smallest among the other indicators.

Table 9. Validity Test Results, Factor Weights, MSA and Mean Score for Library Services

Source: data processed

Indicator	r	Loading Factor	MSA	Mean
The library collections available in the library are following the needs of lectures or learning	0.575	0.727	0.860	3.11
The library collection available in the library is following the needs of research and community service	0.691	0.813	0.708	2.97
Searching, borrowing and returning literature can be done easily	0.652	0.782	0.693	2.98
Students can increase their knowledge after borrowing literature and expedite the learning or graduation process	0.599	0.762	0.738	3.15
Managers and or library service officers are friendly and polite to students	0.632	0.776	0.792	3.14

Source: Data Processed (2022)

Table 9 describes the correlation coefficient values, factor weight values, and the mean from the Library Services aspect. The value of the correlation coefficient for each indicator from the Library Services aspect was found to be in the value range of 0.575 to 0.691. All of these values are above the value of 0.3, which means that all indicators from the Library Services aspect can be declared valid or valid. Then the mean value of each indicator was found to be in the value range of 2.97 to 3.15, so a mean value for the Library Services aspect of 3.07 can be obtained. This means that the Library Services aspect of Polytechnic X vocational higher education services in the city of Bandung is perceived in the medium category by students. The results of the Library Services aspect factor analysis revealed that the KMO and Bartlett's Test values for the Library Services aspect found a KMO MSA value of 0.748 (still greater than 0.50). While the value of Bartlett's Test of Sphericity shows a sign of 0.000 (<0.05). These results indicate that the factor analysis for the Library Services aspect meets the KMO MSA criteria and Bartlett's Test. The Measure of Sampling Adequacy (MSA) value for all indicators examined in the Library Services aspect is > 0.50 , so the minimum MSA score requirements have been met. Factor weights on all aspects of assurance and trust were found to be in the range of 0.727 to 0.813, all of which correlated with the formed factors. All existing indicators can also explain factors because the

extraction value is $> 50\%$. This aspect of Library Services in vocational higher education services is most reflected by the Polytechnic because it has a good library collection available in the library is following the needs of research and community service with the largest factor weight of 0.661, but the average value obtained is the highest. small. Therefore, it is necessary to improve in improving services in the aspect of library collection for these indicators.

Table 10. Validity Test Results, Factor Weights, MSA and Mean Score for Financial Services

Indicator	r	Loading Factor	MSA	Mean
Students can easily get information on the number of bills and clarity of payment procedures	0.571	0.706	0.863	3.18
Students have the convenience of making payment transactions	0.761	0.862	0.768	3.22
The amount of tuition fees is determined according to the services provided to students	0.772	0.870	0.762	3.22
The tuition fee component is following the designation of the activity	0.700	0.813	0.861	3.23
Financial officers are polite and friendly to students	0.704	0.816	0.874	3.16

Source: Data Processed (2022)

The correlation coefficient values, factor weight values, and the mean from the Financial Services aspect are shown in Table 10. The correlation coefficient values for each indicator from the Financial Services aspect were found to be in the range of 0.571 to 0.772. All of these values are above the value of 0.3, which means that all indicators from the Financial Services aspect can be declared valid or valid. Then the mean value of each indicator was found to be in the value range of 3.16 to 3.23 so that a mean value for the Financial Services aspect of 3.202 could be obtained. This means that the Financial Services aspect of Polytechnic X vocational higher education services in the city of Bandung is perceived in the medium category by students. The results of the factor analysis for the reliability aspect revealed that the KMO and Bartlett's Test values for the Financial Services aspect found a KMO MSA value of 0.816 (still greater than 0.50). While the value of Bartlett's Test of Sphericity shows a sign of 0.000 (< 0.05). These results indicate that the factor analysis for the Financial Services aspect meets the KMO MSA criteria and Bartlett's Test. Meanwhile, the Measure of Sampling Adequacy (MSA) value for all indicators examined in the Financial Services aspect is > 0.50 , so the minimum MSA score requirements have been met. Factor weights for all aspects of assurance and trust were found to be in the range of 0.706 to 0.870, all of which correlated with the established factors. All existing indicators can also explain factors because the extraction value is $> 50\%$. Based on the results of calculating the factor weights and the largest average value obtained on the indicator "The amount of tuition fees is determined according to the services provided to students" it can be said that it has provided good service by producing the largest calculation of the other indicators, namely 0.757 and 3.22. It can be noted from several aspects that have been described previously that the Financial Services aspect produces the highest average service value compared to other aspects. This can be a matter of concern for Vocational Higher Education services of Polytechnic X in Bandung City to maintain their performance.

Table 11. Construct Reliability Test Results, Factor Weight Value, MSA, and Mean for Service Quality

Construct	Alpha Cronbach	Loading Factor	MSA	Mean
Educational Facilities	.740	.777	.956	3.200
Reliability	.864	.829	.910	3.153
Responsiveness	.830	.866	.923	3.177
Empathy	.812	.852	.944	3.091

Academic Services Information Systems	.905	.834	.924	3.184
General Facilities & Infrastructure	.775	.758	.919	2.989
Students' interests & activity	.879	.830	.945	3.083
Library services	.828	.853	.917	3.070
Financial services	.873	.791	.903	3.200

Source: Data Processed (2022)

Based on the calculation results in Table 11, it can be seen that Cronbach's alpha value for each construct in the study. All Cronbach's alpha values of each construct were found to be in the range of values from 0.740 to 0.905. With this value, it can be said that high reliability with good consistency in research. The mean values for the constructs observed in the study range from 2,989 to 3,200. The highest mean value lies in the educational facilities and financial services aspect of the Service, which is 3,200. These findings indicate that educational facilities and financial services are the things that are most highly felt by respondents in receiving vocational higher education services. The lowest mean value lies in the general facilities and infrastructure aspect of 2,989. This aspect of general facilities relates to how good the level of cleanliness is in supporting facilities such as toilets.

The results of the factor analysis for the five aspects of the quality of vocational higher education services revealed that the KMO and Bartlett's Test values for the quality of vocational higher education services found a KMO MSA value of 0.926 (still greater than 0.50). While the value of Bartlett's Test of Sphericity shows a sign of 0.000 (<0.05). These results indicate that the factor analysis for the quality of vocational higher education services meet the KMO MSA criteria and Bartlett's Test. The Measure of Sampling Adequacy (MSA) value for all aspects of the quality of vocational higher education services studied was > 0.50 so that the minimum MSA score requirements have been met. Factor weights for all aspects of assurance and trust were found to be in the range of 0.758 to 0.866, all of which correlated with the established factors. All existing indicators can also explain factors because the extraction value is $> 50\%$.

Based on the results of factor analysis calculations with the first selection criteria with eigenvalues where more than 1 will be maintained in the model. With these criteria obtained the number of factors used is 1 factor. Furthermore, the second criterion is based on the total variance value which is explained by the number of factors to be formed. By extracting the initial variables into 1 factor, a fairly large cumulative variation is produced, namely 67,558%, where with 1 factor this can already represent 9 variables in the quality of service in tertiary institutions. If seen from the results of the component matrix the highest factor weight is responsiveness, which is equal to 0.866, while the smallest factor weight is General Facilities & Infrastructure with a value of 0.758. This needs to be paid attention to in improving Polytechnic X vocational higher education services in the city of Bandung so that the services provided are even better.

CONCLUSION

In line with the increasing attention to the quality of service in tertiary institutions, there needs to be a corresponding increase in the use of assessment tools. This study started with the basic SERVQUAL survey instrument. It collects literature on the perceptions and expectations of college students. From the surveys that have been developed and validated over the last decade, several further adjustments were made to adapt the survey instrument to the context of a transformed tertiary institution such as Polytechnic X in Bandung City. The research findings show that the quality of higher education services can be well confirmed in vocational higher education in the city of Bandung. Descriptive empirical facts revealed that the respondents considered that the educational facilities and financial services met the standards of the community satisfaction index that had been set for government organizations. While the thing that is rated the

lowest is general facilities & infrastructure, which relates to the availability of clean toilets and other public facilities. While the results of the factor analysis show that responsiveness is the most important thing that reflects the quality of service in tertiary institutions.

This research is expected to contribute practically and empirically to stakeholders from Polytechnic X in Bandung City so that in the future observers and practitioners can formulate the best plan for strengthening and increasing the competitiveness of Polytechnic X in Bandung City, which can be obtained from higher quality service management. This study is also add empirical evidence that the validation of measures of service quality is a process that lasts a long time and is always dynamic in context and locus so that it is always possible to replicate and modify research instruments on service quality. Likewise, the form of measurement used can always be improved.

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