Assessing Overall Service Quality in Higher Education in the Pandemic Context

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ABSTRACT

Service quality is essential for higher educational institutions (HEIs) to maintain competitiveness and foster growth. Amidst the global COVID-19 pandemic, online learning platforms have experienced significant and rapid expansion. Higher education transitioned to digital learning due to its perceived practicality and enhanced safety. The changes in services provided by HEIs have resulted in alterations in the perception of service quality. Service quality parameters in the pandemic setting differ from regular times due to the predominant delivery of higher education services through online portals. This study enhances the existing knowledge of service quality by examining the many aspects of service quality within the context of the pandemic. Data was obtained from 703 participants using structured questionnaires and analyzed using structural equation modeling (SEM). The results indicate that curriculum, services and facilities, and e-service quality contribute to the overall quality of education in higher education institutions during the pandemic. While this study focused on the higher education sector, the findings contribute to the service literature by deepening the theoretical understanding of the overall service quality amidst certain circumstances.

Keywords: Service quality, higher education, pandemic.

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1. INTRODUCTION

The COVID-19 pandemic has significantly altered the higher education landscape (Quiachon & Paulino, 2023), requiring a re-evaluation of service quality across educational institutions worldwide. The significance of robust quality assessment mechanisms has been emphasized by the abrupt transition to online learning and the challenges of ensuring equitable access to educational resources. To sustain their competitiveness and promote growth, higher educational institutions (HEIs) must prioritize service quality (Al-Otaibi *et al*., 2020). Online learning platforms have expanded rapidly and significantly during the global COVID-19 pandemic (Quiachon & Paulino, 2023). Online education platforms have become indispensable in providing education during lockdowns (Demir *et al*., 2020); however, they also present obstacles

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regarding engagement, assessment, and digital discords. Its perceived practicality and improved safety facilitated the transition to digital learning in higher education (Quiachon & Paulino, 2023). The perception of service quality has been altered because of the changes in services provided by HEIs. Due to the predominance of online portals in delivering higher education services, service quality parameters in the pandemic context are distinct from those in regular times. Various dimensions, such as academic services, administrative support, infrastructure, and the overall learning environment, are included in providing service quality in higher education. The pandemic has tested these dimensions, identifying strengths and areas requiring refinement. Institutions have been compelled to innovate and modify their service delivery models to preserve educational standards and student satisfaction, as the pandemic has expedited the adoption of digital technologies in education. Even though this study is limited to the higher education sector, the findings contribute to the service literature by deepening the theoretical understanding of service quality amidst certain situations.

2. HYPOTHESES DEVELOPMENT

2.1 Relation between Curriculum and Overall Service Quality

According to Ambler *et al*. (2021), there is a strong correlation between the curriculum and students' success since it penetrates their learning experiences. In several studies, the various features of curriculum design have been connected to the level of satisfaction experienced by students. Course design impacts the level of pleasure experienced by students (Nortvig *et al*., 2018). The efficiency of the course and the instructor are other factors that influence the degree to which students are satisfied with their educational experiences (Al-Sheeb *et al*., 2018). Weerasinghe and Fernando (2018) found that the quality of the degree programs or a curriculum that is well-established and flexible also impacts the level of satisfaction experienced by students. Previous studies have established a connection between curriculum and service quality, even though earlier studies have focused on the significant impact of curriculum on student satisfaction. As an illustration, Osman and Saputra (2019) stated that the curriculum was a component or an essential quality dimension of the program's overall quality. In addition, the curriculum was seen as a necessary condition for receiving a quality education. The authors Vijaya and Jiju (2018) state that a lousy curriculum design could fail to meet quality standards. As a result, the following hypothesis is proposed:

H1: *The curriculum predicts overall service quality.*

2.2 Relation between Skills Development and Overall Service Quality

In previous research, such as that conducted by Poon (2019), it was found that the development of skills is one of the critical variables that contribute to the overall satisfaction of students. As a result, most higher education institutions strive to generate graduates with high competency levels. Talents such as communication, problem-solving, critical thinking, and teamwork are examples of abilities that are important and relevant to businesses. These skills go beyond the understanding of a field and technical skills. Cotronei-Baird (2019) and Cotronei-Baird (2020) are two examples of scholars who have referred to these talents as employability skills, professional skills, graduate outcomes skills, or transferable skills. Within the body of research on career management, academics agreed that acquiring career management skills is crucial for securing acceptable work and possibilities for further study. On the other hand, the responsibility for professional development is shifting away from the university and toward the person

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(see Bordean & Sonea, 2018). The students must put much effort into self-exploration to improve their talents. This means they must investigate their experiences and values to determine which professional path is most suitable for them. Consequently, it is of the utmost importance for educational institutions to offer high-quality services that aim to improve student's skills and capabilities and assist them in beginning their future jobs. Supporting students in their pursuit of self-exploration by providing them with relevant channels must be a component of the services provided by the institution. Therefore, it is proposed that:

H2: *The skills development predicts overall service quality.*

2.3 Relation between Services and Facilities and Overall Service Quality

The students evaluate the quality of the services provided by higher education institutions based on various factors, including but not limited to educational services, physical elements, academic services, administrative services, and so on (Camilleri, 2021). Before the pandemic, most services provided by higher education institutions required in-person engagement. As a result, the students' opinions of the quality of the service were primarily focused on how the staff provided the services. The way services are delivered is another factor that contributes to the student's success (Camilleri, 2021). According to Abdulmajeed *et al*. (2021), the school's electronic educational facilities, including electronic educational tools and e-library services, make it possible for students to receive an education of comparable quality during the pandemic. Because these services and facilities offered by the university impact the student's ability to learn, they also impact the quality of the services. According to the research conducted by Yudiawan *et al*. (2021), during the COVID-19 pandemic, essential institutional services provided during regular times became irrelevant. On the other hand, it has been determined that the system's infrastructure, e.g., the internet network, is the most critical factor in the success of the learning process. Therefore, it is postulated that:

H3: *The services and facilities predict overall service quality.*

2.4 Relation between E-Service Quality and Overall Service Quality

Since e-service quality is one of a kind, it is often regarded as an essential component in the success of online commerce. A definition of it is "*an ability of electronic services to satisfy the needs of customers in an effective and efficient manner*" (see Shankar & Datta, 2020, p79). This definition is founded on the idea that the quality of an e-service is distinct from the quality of the service that has been perceived. The extent to which a website can facilitate various transactions is called the e-service quality (Demir *et al*., 2020). According to Demir *et al*.'s 2020 research, e-services in higher education encompass website design, privacy, information quality, and other related topics. According to Simbolon and Yanti (2021), the quality of the e-services offered by online higher education institutions reflects how people perceive the quality of online transactions in various aspects, including fulfillment, agreement, information, and post-sales services. During the COVID-19 epidemic, the introduction of internet-based lecture services in higher education has shifted how lecturers and students engage with one another. The upshot of this is that their level of service is evaluated differently than in the past. Electronic service quality, often known as e-service quality, is the most recent iteration of the service quality concept. E-service quality is an interactive service that interacts with information. One of the competitive advantages that a firm possesses is the quality of its e-service. The expansion of its distribution capabilities, the simplification of

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shopping activities, and the effective and efficient operation of purchases are all made possible by e-service quality. As a result, the following hypothesis is proposed:
H4: *The e-Service quality predicts the overall service quality.*

3. METHOD

3.1 Survey and Sample Characteristics

Using stratified random sampling, a nationwide online survey was launched to generate data using Google Forms. The link for such a survey was distributed to the different HEIs in the country. Internet and social media were also utilized to broaden the survey's reach. Only those who willingly participated in the survey were included as study respondents. This study recruited 703 participants from twenty-four (24) universities and colleges in the Philippines. Regarding sex, 63.3 percent of the respondents were female, while 36.7 percent were male. Most respondents aged 20 to 24, representing 60.74 percent of the total participants, were single (96.87%). Most respondents have bachelor's degrees (83.1%) and are enrolled in public universities or colleges.

Table 1. Demographic Information of Participants (N=703)

Demographics		N	%
Gender	Female	445	63.30
	Male	258	36.70
Age	20-24	427	60.74
Marital Status	Single	681	96.87
Degree	Bachelor's Degree	584	83.10
University	Public	474	67.40

3.2 Measurements

Service quality dimensions were measured using the UnivQual (University Quality) scale developed and validated by Marimon *et al*. (2017) and the e-Service Quality Scale developed by Kaur *et al*. (2020). UnivQual is used to assess the quality of student's experience at the university. The tool has three dimensions: curriculum, skills development, and services and facilities. The instrument has 17 items (curriculum – 7, services and facilities – 6, skills development – 4) and is measured using a five-point Likert-type scale (1 = strongly disagree to 5 = strongly agree). On the other hand, Kaur *et al*.'s (2020) e-service Quality scale measures e-service quality. The scale has six dimensions: information quality and usability, reliability, security and privacy, efficiency, system availability, and assurance. The scale has 26 items and is measured using a 7-point Likert scale ranging from agreement to disagreement (1 = strongly disagree to 7 = strongly agree). Service quality was measured using the Overall Service Quality scale adopted by He and Li (2010). The construct has three items and is measured using a three-point Likert-type response (1 = never, 2 = sometimes, and 3 = always).

3.3 Data Analysis and Hypothesis Testing

Structural Equation Modeling (SEM), a path modeling approach with the aid of WarpPLS 7.0 software, was employed to examine the relationships of the variables under investigation. Structural Equation Modeling is "*a method that allows researchers to model, simultaneously estimate, and test complex theories with empirical data*" (Sarstedt *et al*., 2014, p.106). This technique tests multiple relationships simultaneously (Muchran

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et al., 2024), wherein some can be moderated or mediated. Structural Equation Modeling indicates if the observed data fits adequately (see Lee, 2024; Paulino *et al*., 2021). Thus, it is considered a more effective and comprehensive approach to examining intricate models (Muchran *et al*., 2024; Paulino *et al*., 2021).

4. RESEARCH FINDINGS

4.1 Measurement Model

The outcomes of the construct reliability and validity (convergent and discriminant) are presented by the measurement model with their respective results. An evaluation of the measurement model for reflective indicators in PLS-SEM is based on reliability, convergent validity of the measures linked with specific constructs, and discriminant validity (Hulland, 1999). This evaluation is based on the theory of structural equation modeling. An evaluation of the extent to which a reflective item or group of reflective items is consistent in what it is intended to measure can be carried out using construct reliability assessment. According to Kock (2015), composite reliability and Cronbach's alpha are the two methods that are typically utilized to evaluate construct dependability. If the composite reliability and Cronbach's alpha are greater than or equal to .70 (Fornell & Larcker, 1981; Nunnally, 1978; Nunnally & Bernstein, 1994; Kock, 2015), or if they are greater than the more relaxed requirement of .60 (Nunnally & Bernstein, 1994; Kock, 2015), then construct reliability is satisfactory. All the variables that make up the models in this investigation are trustworthy (please refer to Table 2 for more information). These variables include the Curriculum (Curr), Services and Facilities (Serfa), Skill Development (SkillDev), Service quality (SerQual), and E-Service (E-Serv). According to Kock (2020), a conservative criterion stipulates that the composite reliability and Cronbach's alpha coefficients should be at least 0.70. This is said to be the minimum acceptable value.

The loadings-approach criteria discussed in Amora (2021) were used in concluding that the variables of the study have satisfactory convergent validity, to wit: a) the indicator loadings should be .50 or higher (Kock, 2020; Kock, 2014); b) the p-values associated with the indicator loadings should be less than .05 (Kock, 2020; Kock, 2014); and c) the cross-loadings should be low relative to the indicator loadings. Indicators for which these criteria were not satisfied were excluded from the analysis. In this paper, only SerQual2 (the indicator of Service Quality) was excluded. Excluding the said indicator, all the variables have satisfactory convergent validity because the p-values, indicator loadings, and cross-loadings are within acceptable ranges. The average variance extracted (AVE) can also be used to assess convergent validity. There is evidence of convergent validity if the AVE is .50 or higher (Fornell & Larcker, 1981; Kock & Lynn, 2012; Kock, 2020). E-service is a formative latent variable; hence, indicator weights are appropriate. All indicator loadings have p-values of .000; hence, e-service has satisfactory convergent validity. For reference, the indicator loadings and cross-loadings are still presented. The average variance extracted (AVE) can also be used to assess convergent validity. There is evidence of convergent validity if the AVE is .50 or higher (Fornell & Larcker, 1981; Kock & Lynn, 2012; Kock, 2020) (see Table 3).

Table 2. Reliability Coefficients of the Latent Variables

Variables	Cronbach's Alpha	Composite Reliability
Curriculum	.971	.971
Services and Facilities	.960	.960

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Skills Development	.971	.971
Service Quality	.898	.898
E-Service Quality	.981	.981

Table 3. Convergent Validity Statistics: Indicator Loadings, Cross-loadings, and AVEs

Variables	Indicator Loadings	Range of Absolute Cross-Loadings	P-value of Indicator Loadings	AVEs
Curriculum (Curr)				.826
Curr1	0.925	.016-.257	.000	
Curr2	0.902	.012-.151	.000	
Curr3	0.867	.035-.227	.000	
Curr4	0.911	.038-.192	.000	
Curr5	0.933	.025-.109	.000	
Curr6	0.915	.000-.052	.000	
Curr7	0.908	.003-.231	.000	
Services and Facilities (SerFa)				.799
SerFa1	0.919	.018-.438	.000	
SerFa2	0.877	.010-.099	.000	
SerFa3	0.899	.045-.345	.000	
SerFa4	0.889	.008-.407	.000	
SerFa5	0.882	.030-.403	.000	
SerFa6	0.897	.003-.195	.000	
Skills Development (SkillDev)				.893
SkilDev1	0.922	.018-.054	.000	
SkilDev2	0.962	.001-.080	.000	
SkilDev3	0.981	.000-.081	.000	
SkilDev4	0.915	.005-.047	.000	
Service Quality (SerQual)				.897
SerQual1	0.894	.030-.220	.000	
SerQual3	0.912	.027-.141	.000	
E-Service Quality (E-Serv)				**.799**
IQU	0.935	.016-.070	.135	
Reli	0.955	.029-.124	.206	
SecP	0.938	.006-.126	.158	
Effi	0.953	.005-.120	.222	
SysA	0.935	.012-.198	.116	
Assu	0.966	.029-.054	.197	

Table 4 presents the discriminant validity statistics. The values on the diagonal reflect the square roots of the variable's AVEs, whereas those on the off-diagonal represent correlations between variables. Fornell and Larker (1981) define convergent validity as the square roots of the AVEs being greater than the correlations.

Table 4. Discriminant Validity Statistics

	Curr	SerFa	SkillDev	SerQual	E-Serv
Curr	**0.909**				
SerFa	0.882	**0.894**			
SkillDev	0.846	0.891	**0.945**		
SerQual	0.579	0.601	0.589	**0.903**	
E-Serv	0.807	0.850	0.826	0.759	**0.947**

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4.2 Structural Model

A structural model was estimated to evaluate the four hypotheses. The goodness-of-fit statistics of the proposed model indicate that it is a reasonable fit for the current data. The results in Table 5 show the model's goodness of fit and quality indices are satisfactory. That is, the average path coefficient (APC=.301), average R-squared (ARS=.798), and the average adjusted R-squared (AARS=.797) are statistically significant (p<.05; Kock, 2020), and the average block VIF and average full collinearity VIF are less than 5 (the acceptable range: Kock, 2020). In addition, the Tenenhaus Goodness of Fit (GoF=.822) is large, while the Standardized Root Mean Squared Residual (SRMR=.031) and Standardized Mean Absolute Residual (SMAR=.024) are less than .10, which is acceptable (Kock, 2020).

Table 6 illustrates the structural results of the proposed model. The findings among construct variables relationship show that curriculum (ß=-.071, SE=.037, p<.05), services and facilities (ß=.171, SE=.037, p<.01), and e-service quality (ß=.908, SE=.034, p<.01) were the significant predictors of service quality during the pandemic. Based on Cohen's (1988) rule of thumb about effect size, the effects of curriculum (f^2=.041), services and facilities (f^2=.102), and e-service quality (f^2=.705) on the overall service quality are large extents (see Figure 1).

Table 5. Model Fit and Quality Indices

	Value	P-value	Criteria	Remark
Average path coefficient (APC)	.301	.000	P should be less than .05	Ok. Statistically significant
Average R-squared (ARS)	.798	.000	P should be less than .05	Ok. Statistically significant
Average adjusted Rsquared (AARS)	.797	.000	P should be less than .05	Ok. Statistically significant
Average block VIF (AVIF)	4.277		Acceptable if <=5; ideally <= 3.3	Acceptable
Average full collinearity VIF (AFVIF)	4.249		Acceptable if <=5; ideally <= 3.3	Acceptable
Tenenhaus GoF (GoF)	.822		small >= 0.1, medium >= 0.25, large >= 0.36	Large
Standardized Root Mean Squared Residual (SRMR)	.031		Acceptable if <=0.1	Acceptable
Standardized Mean Absolute Residual (SMAR)	.024		Acceptable if <=0.1	Acceptable

Table 6. Relationships among constructs

Hypotheses	Path Coefficient (β)	Standard Error	p-value	Effect size (f^2)	Remarks
H1: Curr →SerQual	-.071	.037	.029	.041	Supported
H2: SkillDev→SerQual	.054	.038	.074	.032	Not Supported
H3: SerFa→SerQual	.171	.037	.000	.102	Supported
H4: E-Serv→SerQual	.908	.034	.000	.705	Supported

Note: *Effect Size (f^2) is Cohen's (1988) effect size: 0.02=small, 0.15=medium, 0.35=large.*

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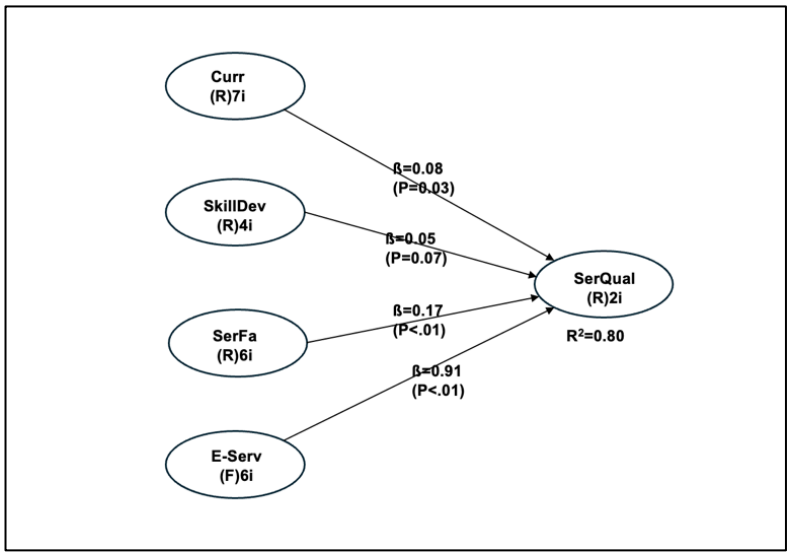

Figure 1: The Structural Model

5. DISCUSSION AND CONCLUSION

The results suggest that the student respondents' perceptions of curriculum, services, facilities, and e-service quality are linked to their perceptions of the overall service quality provided by the HEIs during the pandemic. For instance, the positive coefficient between services and facilities and overall service quality suggests that respondents with high perceptions about services and facilities expect the highest services. The same goes for e-service quality and overall service quality. The respondents with high perceptions of e-service quality tend to expect to get the highest services. Conversely, the negative coefficient between curriculum and service quality suggests that the respondents with high perceptions about curriculum tend not to expect to get the highest services. A positive path coefficient suggests a direct or linear relationship between variables, while a negative path coefficient suggests an inverse relationship among variables. Based on the results, vis-à-vis the service quality dimensions that influenced the overall service quality during the pandemic shows that H1: Curriculum predicts the overall service quality, H3: Services and facilities predict the overall service quality, and H4: e-Service significantly predicts the service quality is accepted. Meanwhile, H2: Skills development predicts the overall service quality, which is rejected.

The results show that not all service quality dimensions affect overall service quality. Among the service quality dimensions tested, only curriculum, services and facilities, and e-service quality appeared to be significant predictors of overall service quality. Student respondents do not consider skills development substantial in their perception of the overall service quality provided by higher education during the pandemic. The results suggest that curriculum (i.e., the structure of the syllabus, course contents, volume and consistency of course loads, lecturer factor, mentoring and personalized attention facets, methods of teaching, and evaluation system) is critical in the student respondents' assessment of the quality of services provided by the HEIs during the pandemic. Furthermore, the results indicate that students benchmark the curriculum for the quality of service of HEIs. Collaborating with the previous study of Abbas (2020), the results show that curriculum is indeed a predictor of overall service quality. Since the curriculum

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permeates the students' learning experiences, how students gauge their learning experiences impacts the quality of service HEIs provide. The better the learning experience due to program design, course effectiveness, instructional effectiveness, or degree program quality, the higher the service quality. If the students' perceptions of those aspects are poor, the quality of services is most likely poor. Like Vijaya and Jiju (2018), poor curriculum design leads to quality failure.

The study also shows that services and facilities are essential in students' perception of quality service. During the pandemic, student respondents evaluate HEI service quality based on the university's/school's mobility activities, facilities, library services and teaching support, student support services, complaints and suggestions response, and website information. These results imply that the university's support services and facilities during the pandemic are essential to students' assessment of HEIs service quality. In agreement with the previous studies, like that of Abdulmajeed *et al*. (2021), which divulged that during the pandemic, the school's electronic educational facilities (e.g., electronic educational tools, e-library services) bring high-quality education equivalent, the present study also found services and facilities provided by the university to affect the students' learning that may lead to high perceptions of service quality. However, the present study's findings contradict those of Yudiawan *et al*. (2021). Services and facilities continue to stay relevant during the COVID-19 pandemic. This may be because most HEIs in the Philippines upgraded their system's infrastructure (e.g., e-learning platforms and learning management systems). At the same time, other institutions adopted systems suited to the pandemic (e.g., distance learning, blended learning, modular learning).

Additionally, the study's findings underscore the service quality or the electronic/online services of HEIs during the pandemic. Students' perception of the overall service quality of HEIs is significantly influenced by system availability, information quality and usability, reliability, security and privacy, assurance, and efficiency. The findings indicate that students anticipate receiving exceptional online services to experience quality service during the pandemic. Additionally, the findings are consistent with those of Yudiawan *et al*. (2021), as they underscore the importance of the quality and infrastructure of digital systems in the efficacy of online learning during the COVID-19 pandemic. Students must have access to the Internet to facilitate their learning. This may influence their assessments and perceptions of the caliber of services offered by higher education institutions. The results also corroborate the assertions of previous studies that not all specific aspects of service quality significantly impact overall service quality (He & Li, 2020; Osman & Saputra, 2019). Service quality was not limited to a specific situation or specific factors. However, not all service quality dimensions similarly influence the aggregate service quality.

The study's findings suggest, in general, that the relevant elements of higher education service quality may differ depending on the situation. Although the study was done in the Philippines, the findings may have far-reaching implications for the service industry. Each industry has a separate market with distinct characteristics, resulting in varying preferences. Regardless of their distinctions, each industry must continue to monitor their customers' preferences to continue providing high-quality services.

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