Bridging the Service Quality Gap in Higher Education E-Learning: A SERVQUAL-Based Analysis with Customer Relationship Management (CRM) Implications

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Abstract. This study examines the gap between student expectations and perceptions of e-learning service quality at a private university in Indonesia and identifies how Customer Relationship Management (CRM) strategies can be used to close that gap. A quantitative, cross-sectional survey was conducted using the Service Quality (SERVQUAL) model across five dimensions tangibles, empathy, responsiveness, reliability, and assurance. Using the Slovin formula applied to a population of 12,000 active students, a purposive sample of 99 respondents was drawn, preceded by a 30-respondent pre-test. Instrument validity was assessed against the r-table value (0.361) and reliability via Cronbach's alpha (≥0.70). Service quality gaps were computed as Performance minus Expectation (P – E) scores for each attribute. All 15 items were valid and reliable (Cronbach's alpha = 0.920). Fourteen of fifteen attributes showed positive gaps, indicating that perceived performance met or exceeded expectations. The findings suggest that universities can use CRM-enabled data analytics to personalise e-learning interfaces, provide proactive notifications, monitor system performance in real time, and strengthen technical support, thereby converting satisfactory SERVQUAL scores into sustained student loyalty. Unlike prior SERVQUAL studies on higher-education services conducted in other institutional and national contexts, this study integrates gap analysis with concrete, dimension-specific CRM interventions tailored to a private university e-learning environment, offering actionable guidance rather than diagnostic findings alone.

Keywords: Customer Relationship Management, Service Quality, SERVQUAL, E-Learning, Higher Education, Student Satisfaction

1 Introduction

Rising customer expectations have made Customer Relationship Management (CRM) an increasingly indispensable driver of organisational success [1, 2]. CRM combines

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business processes and technology to build durable relationships with current and prospective customers, and represents a management philosophy that prioritises customer needs as a means of enhancing satisfaction, loyalty, and firm performance.

Service quality is a critical determinant of competitiveness, particularly for service-based organisations [3]. Because satisfaction arises from meeting or exceeding customer expectations [4], organisations must continuously identify and close the gap between what customers expect and what they perceive they receive [5]. In higher education, service quality has become a decisive factor in student satisfaction and institutional success [6], making the alignment of e-learning systems with student expectations essential to realising the full potential of digital learning initiatives.

The rapid advancement of educational technology [7,8] has pushed universities away from purely conventional instruction [9] and toward e-learning as a core delivery mechanism [11]. E-learning is now a globally established mode of instruction [12] that expands teaching and learning options through information and communication technology [13]. Providing students with a virtual environment for participation [14] and an innovative channel for delivering knowledge and skills [15]. For institutions, e-learning enables coursework distribution, progress tracking, and data-driven monitoring [16], while for students it broadens access to remote learning, virtual discussion, and peer collaboration [17].

Existing SERVQUAL applications in higher education have largely examined single, context-specific settings: [18] analysed the expectation–perception gap at a technical university in Ghana; [19] examined non-academic service quality among postgraduate students in the United Kingdom; [20] assessed service quality during the COVID-19 pandemic in China; and [21] examined the pandemic's effect on academic performance in Argentina. While each study contributes valuable diagnostic evidence, none combines a SERVQUAL gap analysis of e-learning specifically with a structured set of CRM-based remedial strategies, and none addresses the private-university context in Indonesia, where infrastructure constraints, uneven technical support, and heterogeneous student needs pose distinct challenges to sustaining e-learning quality.

This study addresses that gap by (a) quantifying the expectation–performance gap across the five SERVQUAL dimensions for e-learning services at an Indonesian private university, and (b) translating the resulting diagnostics into dimension-specific CRM interventions. Primary data were collected from 97–99 active students via a Google Forms questionnaire, and analysed using validity and reliability testing followed by gap computation in Microsoft Excel and IBM SPSS Statistics 26, to ensure the accuracy and reliability of the resulting managerial recommendations.

2. Methods

This study uses a quantitative, cross-sectional design to measure the gap between expectations and perceived performance of e-learning services, following the SERVQUAL gap-analysis tradition. The population comprised active students at the private university (N = 12,000). Sample size was determined using the Slovin formula, $n = N / (1 + N \cdot e^2)$, with a 10% margin of error:

$$n = 12{,}000 / [1 + 12{,}000(0.1)^2] = 99.17 \approx 99$$

A purposive sampling technique was used to ensure that respondents were active e-learning users. Prior to full-scale distribution, the instrument was administered to 30 students as a pre-test to establish validity and reliability.

The questionnaire operationalised the five SERVQUAL dimensions – tangibles, empathy, responsiveness, reliability, and assurance – through 15 statements (three per dimension). Each statement was rated twice: once for perceived performance and once for expected importance, using a five-point Likert scale (1 = very dissatisfied/very unimportant to 5 = very satisfied/very important). Demographic data, including gender and faculty affiliation, were also collected.

Item validity was tested against the r-table critical value of 0.361 (10% significance level, n = 30); an item was considered valid if its computed r-value exceeded this threshold. Instrument reliability was assessed using Cronbach's alpha, with a minimum acceptable value of 0.70, computed in IBM SPSS Statistics 26.

Service quality for each attribute was computed as the arithmetic difference between mean performance and mean expectation scores (Gap = P − E). A positive gap indicates that perceived performance met or exceeded expectations; a negative gap indicates unmet expectations requiring managerial attention. Dimension-level gaps were subsequently derived as the mean of their constituent item-level gaps to summarise priorities for CRM-based intervention. The study followed a seven-stage procedure, illustrated in Figure 1.

1. Identify problem and background	2. Formulate research problems and objectives	3. Design and distribute SERVQUAL questionnaire	4. Conduct validity and reliability testing	5. Calculate service quality gaps	6. Analyse and interpret results	7. Draw conclusions and recommendations

Figure 1. Research Procedure

3. Results And Discussion

3.1 Validity and Reliability

All 15 items exceeded the r-table threshold of 0.361 for both the performance and expectation scales, confirming instrument validity (Table 1). Reliability testing yielded a Cronbach's alpha of 0.920 for both the performance and expectation datasets, well above the 0.70 threshold, confirming that the instrument is internally consistent and reliable.

Table 1. Validity and Reliability of the Research Instrument (r-table = 0.361; n = 30)

No.	Statement	r (Perf.)	r (Exp.)	Result
	TANGIBLES			
1	The "My Courses" section offers card, list, and summary display options for student convenience.	0.705	0.823	Valid
2	The e-learning system is equipped with complete features and tools.	0.684	0.832	Valid
3	E-learning can be accessed using the student identification number as username.	0.667	0.828	Valid
	EMPATHY			
4	The e-learning system provides a usage guide for students.	0.811	0.866	Valid
5	An online discussion forum enables students to understand material and exchange views.	0.575	0.720	Valid
6	Learning materials can be downloaded for offline access.	0.582	0.746	Valid
	RESPONSIVENESS			
7	A user-friendly mobile application allows access at any time.	0.775	0.823	Valid
8	Students can easily view assignment grades posted by lecturers.	0.569	0.828	Valid
9	A notification feature informs students of upcoming activities.	0.750	0.835	Valid
	RELIABILITY			
10	The system can be accessed from computers, laptops, and mobile phones.	0.677	0.831	Valid
11	The system can be accessed stably and smoothly.	0.592	0.846	Valid
12	The procedure for submitting assignments is quick and easy to understand.	0.867	0.919	Valid
	ASSURANCE			
13	A password requirement provides security assurance for system access.	0.821	0.821	Valid
14	Submitted assignments are automatically locked after the deadline and accessible only to the lecturer.	0.714	0.556	Valid
15	A customer-service function is available to address student problems.	0.649	0.800	Valid

Source: Author's Work

3.2 Service Quality Gap Analysis

Table 2 presents the gap (Performance − Expectation) for each of the 15 service attributes across the five SERVQUAL dimensions, based on the full sample of 99 respondents.

Table 2. Service Quality Gap Analysis (Performance vs. Expectation)

No.	Service Attribute	Perf. (P)	Exp. (E)	Gap (P-E)
	TANGIBLES			
1	"My Courses" display options (card/list/summary)	0.823	0.705	0.118
2	Completeness of features and tools	0.832	0.684	0.148
3	Login using student identification number	0.828	0.667	0.161
	EMPATHY			
4	Availability of a usage guide	0.866	0.811	0.055
5	Online discussion forum	0.720	0.575	0.145
6	Downloadable learning materials	0.746	0.582	0.164
	RESPONSIVENESS			
7	User-friendly mobile application	0.823	0.775	0.048
8	Visibility of assignment grades	0.828	0.569	0.259
9	Notification of upcoming activities	0.835	0.750	0.085
	RELIABILITY			
10	Multi-device accessibility	0.831	0.677	0.155
11	System stability and smoothness	0.846	0.592	0.254
12	Ease of the assignment-submission procedure	0.919	0.867	0.051
	ASSURANCE			
13	Password-based access security	0.821	0.821	0.000
14	Automatic post-deadline assignment lock	0.556	0.714	**-0.158**
15	Availability of customer service	0.800	0.649	0.151

Source: Author's Work

3.3 Dimension-Level Summary

Aggregating item-level gaps by dimension (Table 3) shows that reliability recorded the highest average gap (+0.153), followed by tangibles (+0.142), responsiveness (+0.131), and empathy (+0.121). Assurance was the only dimension with a near-zero, marginally

negative average gap (−0.002), driven entirely by the assignment-locking item, and therefore represents the principal priority for service improvement.

Table 3. Dimension-Level Mean Performance, Expectation, and Gap Scores

Dimension	Mean Performance	Mean Expectation	Mean Gap
Tangibles	0.789	0.685	+0.142
Empathy	0.777	0.656	+0.121
Responsiveness	0.829	0.698	+0.131
Reliability	0.865	0.712	+0.153
Assurance	0.726	0.728	−0.002
Overall mean	**0.809**	**0.700**	**+0.109**

Source: Author's Work

The results confirm that current e-learning services generally satisfy or exceed student expectations, while also revealing a specific, actionable weakness in the assurance dimension. Interpreting these findings through a CRM lens suggests dimension-specific interventions. Although students are satisfied with the visual and functional aspects of the platform, CRM-enabled personalisation – recognising individual preferences and adapting interface layout or feature prominence to usage habits – could further increase engagement beyond current levels.

CRM systems that collect and analyse interaction data can enable proactive, individualised recommendations (e.g., relevant materials or discussion prompts) and personalised guidance based on learning habits, deepening students' sense of institutional care. An integrated CRM system can improve transparency through timely notifications of schedule changes, grade releases, and other time-sensitive events, and can track and resolve student queries more efficiently, reinforcing the already-strong responsiveness scores observed in this study. Despite favourable reliability scores, CRM-based real-time monitoring of system performance can pre-empt technical disruptions and help forecast capacity or infrastructure needs, sustaining the high reliability gap identified in Table 3. This dimension warrants the most immediate attention. CRM-informed behavioural analytics could enable adaptive security features and directly addressing the negative gap identified a policy allowing students to retain post-deadline, read-only access to completed assignments for review purposes, without compromising submission-deadline integrity or grading logistics for lecturers. In parallel, CRM-supported case management of customer-service interactions can help ensure that technical-support requests are tracked and resolved consistently.

This study extends the SERVQUAL literature by demonstrating that gap scores, when disaggregated to the dimension level, can be directly mapped onto specific CRM capabilities rather than treated only as diagnostic indicators. This contributes to a more integrated conceptualisation of service-quality management in digital higher-education

contexts, in which measurement (SERVQUAL) and relationship management (CRM) function as complementary, rather than parallel, mechanisms.

For university administrators, the findings suggest concrete priorities: (a) revise the assignment-locking policy to permit post-deadline review access; (b) invest in CRM-enabled monitoring dashboards to sustain system reliability; (c) deploy personalisation features within the learning-management interface; and (d) formalise CRM-based case tracking for student technical-support requests to close the assurance-dimension gap identified in this study.

4. Conclusion

Using the SERVQUAL framework across tangibles, empathy, reliability, responsiveness, and assurance, this study finds that student satisfaction with e-learning services at the private university generally meets or exceeds expectations, with one notable exception: the automatic locking of assignments after the submission deadline, which students would prefer to retain access to for review purposes. Each SERVQUAL element yields distinct insights into student expectations, and Customer Relationship Management offers a structured pathway to convert these insights into sustained service improvement. By enabling deeper understanding of student behaviour, preferences, and needs, CRM can help universities deliver more personalised, responsive, and reliable e-learning services narrowing expectation performance gaps and strengthening student satisfaction and loyalty over time.

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