

The effect of university service quality on student satisfaction and student engagement

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ABSTRACT

This study examined the effects of university service quality on student satisfaction and student engagement and tested the mediating role of engagement in the relationship between service quality and satisfaction. A cross-sectional quantitative survey was conducted with 323 accounting students from three universities in Surabaya, Indonesia. The data were analyzed using partial least squares structural equation modeling (PLS-SEM) with 5,000 bootstrap resamples. The measurement model demonstrated acceptable internal consistency and convergent validity for university service quality, student engagement, and student satisfaction. University service quality had strong positive effects on student satisfaction ($\beta = .800$, $t = 40.744$, $p < .001$) and student engagement ($\beta = .875$, $t = 35.123$, $p < .001$). Student engagement also positively affected student satisfaction ($\beta = .231$, $t = 6.296$, $p < .001$). The model explained 76.6% of the variance in engagement and 71.2% of the variance in satisfaction. The indirect effect of service quality on satisfaction through engagement was significant ($\beta = .202$, $t = 5.845$, $p < .001$, 95% CI [.145, .268]), indicating complementary partial mediation. The findings highlight service quality as a central institutional resource for strengthening both students' evaluative satisfaction and their active engagement in university learning.

Keywords: Higher education service quality, student satisfaction, student engagement, PLS-SEM, university management.

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INTRODUCTION

Higher education institutions operate in an environment in which students evaluate not only academic content but also the broader quality of services that support their learning experience. Registration systems, academic advising, lecturer accessibility, administrative responsiveness, digital platforms, facilities, communication, and student-support services collectively shape how students perceive their university. As competition for students intensifies and expectations for service responsiveness increase, service quality has become a strategic issue for universities seeking to improve student experience and institutional outcomes (Ali et al., 2016; Teeroovengadum et al., 2019).

Service quality in higher education differs from quality in conventional commercial services because the educational experience is co-produced by institutions and students. Students are recipients of services, but they are also active participants whose effort, interaction, and engagement influence educational outcomes. Higher-

education service-quality instruments such as HEdPERF, HiEduQual, and HESQUAL therefore include academic, administrative, support, access, reputation, and physical-environment dimensions rather than relying exclusively on generic service-quality indicators (Abdullah, 2006; Annamdevula and Bellamkonda, 2016; Teeroovengadum et al., 2019).

Student satisfaction is among the most frequently studied outcomes of university service quality. Satisfaction reflects an overall evaluation of whether educational experiences and institutional services meet or exceed student expectations. Previous studies have consistently reported positive associations between perceived service quality and satisfaction in higher education (Ali et al., 2016; Chaudhary and Dey, 2021; Pham et al., 2019). However, satisfaction captures only one aspect of the student experience. A student may be satisfied with facilities and administrative efficiency while remaining relatively passive in academic activities. For this reason, student

engagement should be examined as a distinct outcome.

Student engagement refers to students' behavioral participation, emotional connection, cognitive investment, and purposeful involvement in learning and university life. Engagement is shaped by both student characteristics and institutional conditions (Kahu, 2013; Kahu and Nelson, 2018). When institutional services are reliable, accessible, and supportive, they may reduce barriers to participation and strengthen students' willingness to invest effort in learning. Recent evidence supports a direct relationship between higher-education service quality and engagement, suggesting that service quality may have consequences beyond satisfaction alone (Kankhuni et al., 2023).

The present study integrates these perspectives by examining university service quality as an antecedent of both student satisfaction and student engagement and by testing the additional relationship between engagement and satisfaction. This structure reflects the analytical logic commonly used in PLS-SEM studies of higher education: first establishing the reliability and validity of the measurement model, then assessing explained variance, and finally testing structural paths among the latent constructs. The study contributes by placing satisfaction and engagement in the same model and by evaluating whether engagement provides an additional mechanism through which service quality can shape the overall student experience.

Accordingly, the objectives of this study are to: (1) determine the effect of university service quality on student satisfaction; (2) determine the effect of university service quality on student engagement; (3) examine the effect of student engagement on student satisfaction; and (4) test the indirect effect of university service quality on satisfaction through engagement.

Research questions

The study addresses four research questions: (1) Does university service quality significantly influence student satisfaction? (2) Does university service quality significantly influence student engagement? (3) Does student engagement significantly influence student satisfaction? (4) Does student engagement mediate the relationship between university service quality and student satisfaction?

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

University service quality

University service quality represents students' judgments about the effectiveness, reliability, responsiveness, accessibility, and overall adequacy of services delivered

by a higher education institution. HEdPERF emphasizes both academic and non-academic aspects of the university experience (Abdullah, 2006), whereas later models such as HiEduQual and HESQUAL extend the construct to include administrative services, support, physical environment, institutional image, and transformative aspects of higher education (Annamdevula and Bellamkonda, 2016; Teeroovengadum et al., 2019). These models recognize that students experience the university as an interconnected service system in which academic and administrative encounters jointly shape perceived quality.

Service quality is particularly important because students repeatedly interact with the institution across multiple touchpoints. Clear communication, timely administrative support, lecturer responsiveness, reliable digital systems, suitable learning facilities, and accessible student services can reduce friction and strengthen the perception that the institution is competent and supportive. Such perceptions are expected to influence both evaluative outcomes, such as satisfaction, and behavioral or psychological outcomes, such as engagement.

Student satisfaction

Student satisfaction is an overall evaluative response to educational experiences, services, and institutional performance. It is commonly conceptualized as the degree to which the university experience meets students' expectations and needs. Empirical research has repeatedly identified service quality as an important antecedent of satisfaction. For example, Ali et al. (2016) found that higher-education service-quality dimensions significantly influenced satisfaction among international students, while Teeroovengadum et al. (2019) confirmed the central role of service quality in a broader model involving perceived value, image, satisfaction, and loyalty. Similar patterns have been documented in e-learning and sustainability-oriented university contexts (Chaudhary and Dey, 2021; Pham et al., 2019).

When students perceive that academic and administrative services are dependable, staff are responsive, information is clear, and facilities or digital resources are adequate, they are more likely to evaluate their university experience positively. Therefore, the following hypothesis is proposed:

H1. University service quality has a positive effect on student satisfaction.

Student engagement

Student engagement is a multidimensional construct that encompasses the effort, attention, participation, emotional involvement, and cognitive investment that students

devote to learning. Kahu (2013) positioned engagement between its antecedents and educational consequences, emphasizing that it should not be reduced to attendance alone. Kahu and Nelson (2018) further argued that engagement emerges at the educational interface where student characteristics interact with institutional conditions. Measurement research also supports a multidimensional understanding of engagement in higher education (Gunuc and Kuzu, 2015).

Institutional service quality can influence engagement by shaping the conditions under which students learn. Responsive academic support, accessible information, efficient administrative processes, functional learning platforms, and supportive staff can reduce frustration and enable students to devote more attention to academic tasks. Kankhuni et al. (2023) reported that higher-education service quality positively influenced student engagement, providing direct support for the view that institutional services can function as engagement resources. Therefore:

H2. University service quality has a positive effect on student engagement.

Student engagement and student satisfaction

Engagement may also contribute to satisfaction because actively involved students are more likely to experience meaningful interaction, progress, belonging, and accomplishment. Students who participate in learning activities and invest effort in their studies may develop more favorable evaluations of their educational experience. Nevertheless, the strength of the

engagement-satisfaction relationship can vary by context. Some studies report a positive association, while others indicate that the effect may weaken once institutional and relational factors are included in the model. This variability makes direct testing important rather than assuming that engagement and satisfaction are interchangeable outcomes.

Drawing on the broader engagement literature and the expectation that active involvement supports positive educational experiences, the following hypothesis is proposed:

H3. Student engagement has a positive effect on student satisfaction.

Mediating role of student engagement

If service quality promotes engagement and engagement contributes to satisfaction, then engagement may transmit part of the effect of service quality on satisfaction. Conceptually, supportive and well-functioning services can create conditions that make it easier for students to participate, interact, and concentrate; these engagement experiences may subsequently strengthen their satisfaction. At the same time, service quality may retain a direct effect on satisfaction because students can evaluate service encounters independently of their level of engagement. The resulting model therefore allows for partial mediation.

H4. Student engagement mediates the positive relationship between university service quality and student satisfaction.

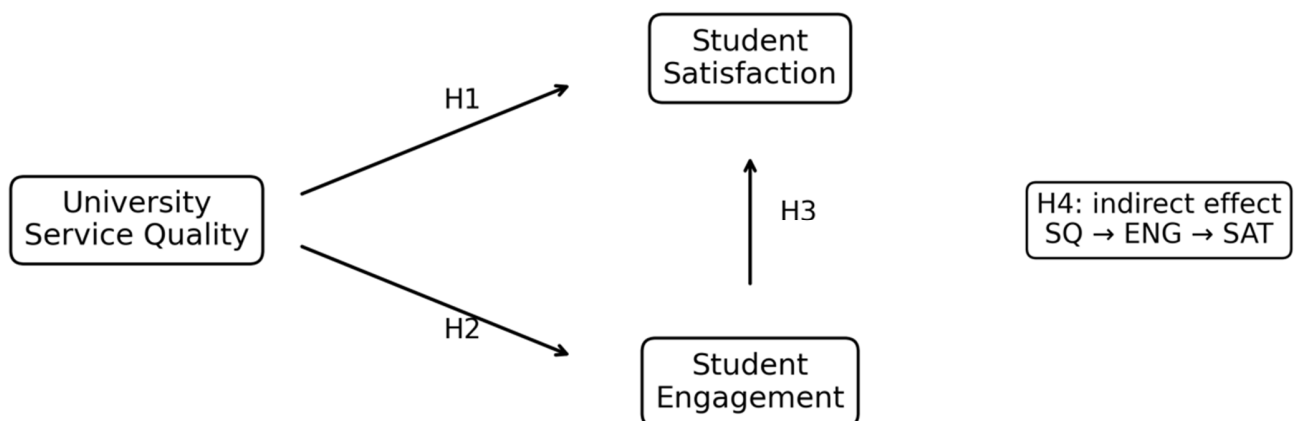


Figure 1. Conceptual Framework. Note. SQ = university service quality; ENG = student engagement; SAT = student satisfaction. H4 represents the indirect pathway SQ → ENG → SAT.

METHODS

Research design and setting

A quantitative, cross-sectional survey design was used to test the hypothesized relationships. The study focused on accounting students enrolled at three universities in Surabaya, Indonesia. The unit of analysis was the individual student, and the empirical model examined university service quality as an antecedent of student engagement and student satisfaction, together with the effect of engagement on satisfaction.

Population, sampling and sample size

The target population comprised accounting students who were actively enrolled and had experienced online learning. Purposive sampling was used to recruit students from the 2018–2021 entry cohorts. A total of 385 responses were received. After screening for eligibility and completeness, 323 responses were retained for analysis, corresponding to 83.9% of the received responses.

The final sample size of 323 was adequate for the proposed PLS-SEM model, which contained a small number of predictors for each endogenous construct and used bootstrapping for significance testing. The sample also exceeded commonly used minimum recommendations for stable PLS-SEM estimation in models of this complexity (Hair et al., 2019).

Instrument and measures

The questionnaire consisted of two sections. The first section collected demographic and study-related information, including gender and age. The second section measured university service quality, student engagement, and student satisfaction using multi-item Likert-type measures adapted from established higher-education research.

University service quality was represented by three indicators reflecting students' evaluations of institutional services. Student engagement was measured with five indicators capturing involvement in learning activities, and student satisfaction was measured with six indicators reflecting students' overall evaluation of their university experience. The measurement approach was informed by established higher-education service-quality and engagement research (Abdullah, 2006; Gunuc and Kuzu, 2015; Teeroovengadum et al., 2019).

Data collection

The questionnaire was administered online to eligible students. Responses were screened before analysis, and

only cases that satisfied the sampling criteria and contained usable data were retained. The resulting analytical sample comprised 323 students.

Data analysis

Data analysis was conducted using descriptive statistics and partial least squares structural equation modeling (PLS-SEM). The analysis followed a two-stage procedure. First, the reflective measurement model was evaluated using indicator loadings, Cronbach's alpha, rho_A, composite reliability (CR), and average variance extracted (AVE). Reliability coefficients of approximately .70 or higher and AVE values of .50 or higher were treated as evidence of acceptable construct quality (Hair et al., 2019).

Second, the structural model was evaluated using standardized path coefficients, coefficients of determination (R^2), and bootstrapped significance tests. Bootstrapping with 5,000 resamples was used to obtain t-statistics and p-values for the direct paths and the specific indirect effect. The mediating effect of student engagement was assessed through the indirect path from university service quality to student satisfaction via engagement. Statistical significance was evaluated at $p < .05$, and mediation was considered significant when the 95% bootstrap confidence interval for the indirect effect did not include zero.

RESULTS

Respondent profile

After data screening, 323 valid responses were included in the final analysis. The sample consisted of 191 female students (59.1%) and 132 male students (40.9%). Most respondents were 18–21 years old ($n = 246$, 76.2%), followed by those older than 21 years ($n = 67$, 20.7%) and those younger than 18 years ($n = 10$, 3.1%). All respondents were accounting students drawn from three universities. Table 1 summarizes the respondent profile.

Table 1. Profile of respondents.

Characteristic	Category	n	%
Gender	Female	191	59.1
Gender	Male	132	40.9
Age	< 18 years	10	3.1
Age	18–21 years	246	76.2
Age	> 21 years	67	20.7

Note. Percentages may not total exactly 100% because of rounding.

Measurement model

The reflective measurement model was evaluated before testing the structural relationships. As shown in Table 2, Cronbach's alpha ranged from .713 to .833, rho_A from .714 to .868, and composite reliability from .840 to .877. All AVE values exceeded .50, ranging from .544 to .636, supporting convergent validity. The service-quality and

satisfaction indicators showed generally acceptable loadings. The engagement construct had a wider loading range (.318–.926), including one weak indicator; however, the construct-level reliability and AVE remained above the adopted thresholds. The engagement results should therefore be interpreted with this measurement limitation in mind.

Table 2. Construct reliability and convergent validity.

Construct	Items	Loading range	Cronbach's α	rho_A	CR	AVE
University service quality	3	.764–.820	.713	.714	.840	.636
Student engagement	5	.318–.926	.785	.868	.863	.579
Student satisfaction	6	.710–.787	.833	.836	.877	.544

Note. CR = composite reliability; AVE = average variance extracted. Common guidelines: α , rho_A, and CR $\geq$.70; AVE $\geq$.50.

Structural model and explained variance

The structural model demonstrated substantial explanatory power. University service quality explained 76.6% of the variance in student engagement ($R^2 = .766$;

adjusted $R^2 = .765$). University service quality together with student engagement explained 71.2% of the variance in student satisfaction ($R^2 = .712$; adjusted $R^2 = .710$). Table 3 summarizes the explained variance of the endogenous constructs.

Table 3. Explained variance of endogenous constructs.

Endogenous construct	R^2	Adjusted R^2	Variance explained
Student engagement	.766	.765	76.6%
Student satisfaction	.712	.710	71.2%

Hypothesis testing

Bootstrapping with 5,000 resamples was used to test the structural paths. University service quality had a positive and significant effect on student satisfaction ($\beta = .800$, $t = 40.744$, $p < .001$), supporting H1. University service quality also had a positive and significant effect on student

engagement ($\beta = .875$, $t = 35.123$, $p < .001$), supporting H2. Student engagement had a positive and significant effect on student satisfaction ($\beta = .231$, $t = 6.296$, $p < .001$), supporting H3. The results show that service quality was the strongest direct predictor in both endogenous equations.

Table 4. Path coefficients and hypothesis tests.

Hypothesis	Relationship	β (O)	STDEV	t	p	Decision
H1	Service quality $\rightarrow$ Satisfaction	.800	.020	40.744	< .001	Supported
H2	Service quality $\rightarrow$ Engagement	.875	.025	35.123	< .001	Supported
H3	Engagement $\rightarrow$ Satisfaction	.231	.037	6.296	< .001	Supported

Mediation analysis

The specific indirect effect of university service quality on student satisfaction through student engagement was positive and significant ($\beta = .202$, $t = 5.845$, $p < .001$, 95% bootstrap CI [.145, .268]). Because the confidence interval

did not include zero, H4 was supported. The direct effect of service quality on satisfaction remained positive and significant after inclusion of the mediator ($\beta = .800$, $p < .001$). Because both the direct and indirect effects were significant and operated in the same direction, the findings indicate complementary partial mediation.

Table 5. Specific indirect effect.

Indirect relationship	β	t	p	95% CI LL	95% CI UL	Decision
Service quality → Engagement → Satisfaction	.202	5.845	< .001	.145	.268	Supported

DISCUSSION

The purpose of this study was to examine how university service quality relates to student satisfaction and student engagement and to test engagement as a mediating mechanism. The first major finding was that service quality exerted a strong positive effect on student satisfaction ($\beta = .800$). This result is consistent with prior higher-education research showing that students' evaluations of academic and non-academic services are important determinants of satisfaction (Ali et al., 2016; Annamdevula and Bellamkonda, 2016; Teeroovengadum et al., 2019). The magnitude of the path suggests that students' day-to-day experiences with university services are central to their overall evaluation of the institution.

The second finding showed that university service quality strongly predicted student engagement ($\beta = .875$). This result supports the argument that institutional services are not merely peripheral conveniences; well-functioning services can create conditions that facilitate participation, concentration, interaction, and sustained academic effort. The finding is consistent with Kahu and Nelson's (2018) educational-interface framework and with empirical evidence reported by Kankhuni et al. (2023), who found that higher-education service quality positively influenced student engagement.

The third finding confirmed that student engagement positively contributed to student satisfaction ($\beta = .231$). Although the effect was smaller than the direct service-quality effect, it remained statistically significant. This indicates that students' active involvement in learning contributes an additional source of positive evaluation beyond their direct perceptions of institutional services. The result also reinforces the value of modeling engagement and satisfaction as related but distinct constructs.

The mediation analysis further showed that student engagement partially transmitted the effect of service quality on satisfaction (indirect $\beta = .202$, 95% CI [.145, .268]). Because the direct effect remained significant and the indirect effect was positive, the pattern represents complementary partial mediation. In practical terms, universities can strengthen satisfaction through two pathways: directly, by improving the quality of services students receive, and indirectly, by creating service conditions that encourage students to participate more actively in learning.

Theoretical implications

The study contributes to the higher-education service-

quality literature by integrating an evaluative outcome (satisfaction) and a motivational-behavioral outcome (engagement) in one structural model. Service-quality studies have traditionally emphasized satisfaction, perceived value, image, and loyalty, whereas engagement research has more often focused on psychological, pedagogical, and relational antecedents. Bringing these streams together helps clarify whether institutional service quality operates only through students' evaluations of the institution or also through their active involvement in learning.

The model also distinguishes direct and indirect pathways. A significant service-quality-to-engagement path would support an institutional-resource interpretation of engagement, while a significant engagement-to-satisfaction path would position engagement as one mechanism linking institutional conditions to students' overall evaluations. This distinction is useful because it avoids collapsing satisfaction and engagement into a single broad notion of student experience.

Practical implications

For university administrators, the results should be translated into improvements across the student journey rather than isolated service departments. Academic advising, registration, communication, lecturer accessibility, learning-management systems, library and digital resources, facilities, and student-support services should be monitored for reliability, response time, clarity, and accessibility. If service quality shows a comparatively large effect on satisfaction, universities should prioritize high-frequency service encounters where delays, ambiguity, or inconsistent treatment are most visible to students.

If service quality also predicts engagement, service improvement becomes part of the university's learning strategy rather than only a customer-service objective. Institutions can support engagement by reducing administrative friction, ensuring timely academic support, making learning resources easy to access, and strengthening the connection between students and staff. These practices should complement pedagogical strategies that build autonomy, competence, feedback, and meaningful interaction.

Limitations and future research

Several limitations should be considered. First, the cross-sectional design limits strong causal inference because all

variables were measured at one point in time. Second, the sample consisted of accounting students from three universities in one city, which may limit generalizability to other disciplines, institutions, and national contexts. Third, the study relied on self-reported perceptions. Fourth, the student-engagement measurement included one comparatively weak indicator (loading = .318), even though construct-level reliability and AVE met the adopted thresholds. Future research should use longitudinal or multi-source designs, test the model across disciplines and university types, and refine the engagement scale before replication.

Future studies may also model university service quality as a higher-order multidimensional construct and examine which dimensions—academic quality, administrative quality, support services, access, physical environment, or digital service quality—most strongly influence satisfaction and engagement. Incorporating learning outcomes, loyalty, persistence, or institutional attachment would further clarify the downstream consequences of service quality and engagement.

CONCLUSION

This study investigated the effects of university service quality on student satisfaction and student engagement using PLS-SEM. University service quality had significant positive effects on both satisfaction ($\beta = .800$) and engagement ($\beta = .875$), while student engagement also positively affected satisfaction ($\beta = .231$). Service quality explained 76.6% of the variance in engagement, and service quality together with engagement explained 71.2% of the variance in satisfaction. The indirect effect through engagement was significant ($\beta = .202$, 95% CI [.145, .268]), demonstrating complementary partial mediation. Overall, the findings position university service quality as a strategic component of the student experience: it directly shapes students' satisfaction while also fostering engagement that further contributes to positive evaluations of the university.

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