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Exploring How Service Quality Drives Student Satisfaction in Higher Education

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ABSTRACT

This study investigates the relationship between service quality and student satisfaction within higher education institutions. Drawing on the HESQUAL model, it examines six dimensions of service quality: administrative quality, teaching quality, physical environment, support services, e-service quality, and transformative quality. Data were collected through an online survey of 956 students and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that transformative quality, e-service quality, and staff attitudes positively influence student satisfaction, whereas pedagogical practices and support services do not have significant effects. The study extends the multi-contextual understanding of university satisfaction by identifying relational, digital, and transformative dimensions as key drivers of the student experience. These findings provide actionable priorities for institutions seeking to strengthen student satisfaction, institutional reputation, and long-term sustainability.

Keywords: Service Quality, Student Satisfaction, Higher Education, HESQUAL Model, Institutional Performance
JEL Classifications: I23, M31

1. INTRODUCTION

In recent decades, higher education has undergone considerable change driven by globalization, intensified competition among institutions, and changing student populations. As a result of these changes, institutions have had to reconsider their mission from an academic standpoint and rethink the quality of service they provide to their students. The move towards thinking of students as "clients" or participants within the educational exchange has led to service quality within the educational experience becoming a strategic variable that may influence student satisfaction, student engagement, and student loyalty to an institution.

Service quality within higher education has a far wider remit than just the in-classroom experience for students. It also includes administrative, technological, and relational processes that contribute to student perspectives of their learning experience as a whole. The development of conceptual models, such as SERVQUAL (Parasuraman et al., 1988), HEdPERF (Firdaus, 2005), HESQUAL (Teeroovengadum et al., 2016; Teeroovengadum et al., 2019) have all reinforced the notion that service quality is itself a multidimensional construct. A multitude of factors influence student satisfaction, such as: quality of teaching, quality of infrastructure, quality of administration, quality of learning environment and even more recently, quality of digital and e-services.

In a globalized and increasingly digitalized educational landscape, understanding the determinants of student satisfaction has become more important for the sustainability of institutions. Universities are now expected to provide not only high-quality academic experiences, but also organizational and technological environments that foster personal and professional growth.

The aim of this study is to investigate the impact of service quality on student satisfaction within higher education. Using the HESQUAL

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framework, this study seeks to investigate how the dimensions of service quality, identified in the framework—administrative quality, teaching and learning, physical environment, support services, e-service quality, and transformative quality, may cumulatively relate to overall satisfaction. This study seeks to provide an overarching understanding of how the dimensions of service quality relate to satisfaction by applying the framework, and provide strategic insights with actionable recommendations to higher education institutions to enhance student experience, institutional performance and sustainability through student satisfaction.

2. LITERATURE REVIEW

2.1. Quality Service Determinants

Perceived quality of service in higher education has emerged as an area of interest in relation to institutional performance, student satisfaction, and competition in a higher education context that is rapidly becoming increasingly globalized. Quality of service in the context of higher education refers to a number of aspects that influence a student's perceptions of the quality of educational service. These include Internet access, availability of subject-related programs in a timely fashion, expedient administrative processing and faculty-student interaction. In addition, quality also encompasses educational settings that involve the intellectual intensity and organizational capacity of institutions but also reflect the extent to which students are exposed to enriching experiences that promote their academic and personal development. Physical facilities, technology, faculty accessibility and the supportive nature of the climate, further enhance students' engagement with their academic learning endeavors and contribute to the image and perceived status of the institution.

The notion of students as clients is an important part of the current dialogue about quality in service delivery within higher education. Drawing on Gamage et al. (2008) and Sohail and Shaikh (2004), the idea of "clientele" is emerging, which suggests that students are now being identified as active participants within the educational exchange and service-dominant logic with service providers, i.e. a university, who they expect to provide education related to gaining knowledge and professional capabilities. When we consider education in a service sense, we assume education is, indeed, an exchange in which the institution is deriving value and responding to the value proposition of the student, in the same way that a customer may derive value from an organization's products/services (Cam et al., 2024). The notion of students as clients is not without merit, however. Opponents contend that students as clients may be a dangerous construct, as it may diminish the educational relationship to a transactional authority, but ineffectively retheorizes the relationship as educational quality, and does little to consider the institutional formative, ethical, and social aspects of higher education overall (Kankhuni et al., 2023). Moreover, the notion of 'client' extends past the students as clients to other stakeholder groups, such as parents, employers, governments, and society, thereby exposing the complexities of the multi-actor quality management associated with a university (Arif et al., 2023).

In the past few decades, expectations for higher education providers to enhance their service quality have increased in contexts of decreasing public funding and increasing global competition (Harvey and Williams, 2010). Although universities are not profit-driven entities, they have employed managerial approaches found in other sectors, such as industry, to enhance their service delivery and to safeguard their reputational capital (Halai, 2013). Empirical evidence shows that perceived service quality is central to student loyalty and institutional sustainability (Zammuto et al., 1996). If students perceive any dimension of service quality as poor, the institution's reputation and attractiveness, ultimately its financial viability, may be jeopardized. This indicates that quality regarding academic and administrative processes is salient to perceptions and outcomes.

Historically, the SERVQUAL model (Parasuraman et al., 1988) has been foundational in measuring service quality within different contexts, including education. The model measures the gap between customer expectations and perceived performance, across five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. In higher education SERVQUAL has been used extensively to measure the quality of teaching, administrative efficiency, and support services (Ford et al., 1999; McElwee and Redman, 1993).

Nonetheless, the model has been extensively criticized, despite its widespread acceptance and use. Researchers such as Brochado (2009) and Hameed and Amjad (2011) have questioned the theoretical underpinning of expectation measures, claiming that they are unstable and depend on the situation. Operational criticisms also indicate that SERVQUAL's items may not accommodate the inherent complexity involved in educational services, and the paired expectation–perception statements complicate data collection and introduce potential bias (Wisniewski, 2001).

In response to these limitations, SERVPERF (Cronin and Taylor, 1992) and later, HEdPERF (Firdaus, 2005), were developed as a performance-based model. SERVPERF circumvents some of the challenges of using alternative models by only focusing on performance perception rather than expectation gap. Evidence suggests that SERVPERF offers scores that are more stable and reliable. Firdaus (2005) introduced HEdPERF, a higher education service quality model, as a significant step forward, as it identifies the academic and non-academic components of students' experiences. Grounded in empirical studies in Malaysian Universities, HEdPERF proposes five determinants of service quality: non-academic factors (responsiveness and fairness of administration staff), academic factors (the faculty's level of engagement and feedback), reputation (the institution's prestige and recognition of the program), access (contacting faculty, accessibility of resources), and program factors (curricular flexibility and relevance). Compared with SERVPERF, HEdPERF explains a greater portion of the variance in student satisfaction, suggesting a higher contextual validity for the higher education sector (Brochado, 2009; Huang, 2009).

However, although HEdPERF advanced the measurement of service quality, it has been criticized for its limited consideration

of other stakeholders like employers, policy makers and industry partners. Acknowledging this drawback, Teeroovengadum et al. (2016) developed HESQUAL, which includes functional and technical service quality. Functional quality is concerned with the mechanisms by which education services are delivered, whereas technical quality explores higher education's change-making orientation by transforming the knowledge, abilities and attitudes of students. Subsequent studies (Teeroovengadum et al., 2019) demonstrated that technical quality, referred to here as transformative quality, is a significant predictor of student satisfaction, institutional image, and loyalty. This further supports the argument that universities should not only view themselves as an institution that delivers services, but as a transformative body that influences the intellectual and professional identities of learners.

Beyond measurement models, the determinants of perceived service quality have been widely discussed across the literature. Parasuraman et al. (1985) first identified ten determinants - access, communication, competence, courtesy, credibility, reliability, responsiveness, security, understanding and tangibles - then condensed these into five dimensions that later formed the theoretical framework SERVQUAL. Following Johnston and Silvestro (1990), Hameed and Amjad (2011), and Aldridge and Rowley (1998) extended these linkages to include notions of flexibility, integrity, aesthetics, and comfort to highlight that service quality involves multidimensional alignments that are contextualized. In higher education, multidimensionality is expressed when teaching quality, administrative performance, facilities and institutional reputation are aligned with stakeholder expectations.

Perceived service quality in higher education cannot be reduced to a single model. It arises from a confluence of academic, administrative, and relational processes with regard to different stakeholders, and from diverse cultural and institutional contexts. The move from SERVQUAL to HEdPERF and HESQUAL draws on yet a further epistemological change – the shift away from students as 'end-users' of a poorly understood educational experience, towards students as co-producers of value in an increasingly variegated educational environment. Because of these factors, perceptions of service quality are not simply based on an organization's performance—they are socially constructed in experiences, expectations and transformations conferred through the modernization and contextual reality surrounding higher education.

2.2. Student Satisfaction in Higher Education

Student satisfaction in higher education is a complex and multidimensional concept that is an important contributor to the success and sustainability of universities. As Andreassen and Lindestad (1998) note, satisfaction may be defined using two distinct but related approaches – transaction-specific satisfaction (referring to one experience), and cumulative satisfaction (which refers to an overall evaluation based upon a series of experiences over time). Oliver (1980) further supports this assertion when he suggests that cumulative satisfaction is a general perception after several experiences in some context involving the student and the educational setting (e.g. their academic experience). Cumulative satisfaction is particularly relevant in the university context as the student experience is extended beyond single courses and semesters encompassing academics, administrative issues and social lives on campus.

Kotler and Clarke (1987) further describe satisfaction as a state of being experienced when the performance of a service experience meets or exceeds expectations. In terms of higher education, student satisfaction is a result of the alignment of the student's expectations and the quality of their perception of their academic experience. As Hill et al. (2003) note, however, the main issue is developing a standardized definition of student satisfaction, given that theories related to satisfaction which originated in the consumer satisfaction literature will have to be modified to fit the educational context. Students' expectations often form even before entering university (Palacio et al., 2002) and evolve throughout their academic journey based on their interactions with instructors, facilities, and administrative services (Carey et al., 2002).

Student satisfaction is described as a subjective assessment of a student's educational experiences and educational success (Elliot and Shin, 2002). It is primarily dependent on the teaching quality, support services, and institutional environment. A number of studies elucidate the main elements that shape student satisfaction. Douglas et al. (2006) outline teaching ability, quality of the curriculum, university image, independence, personal development and campus environment as main aspects. Likewise, Rowley (2003) asserts the quality of lectures, the appearance of the campus and the effective use of technology as main influencers of student satisfaction. Lassar et al. (2000) add to this list teacher-student relationship, program content, library services, and availability of learning materials.

Different models have been produced to measure student satisfaction in higher education. The SERVQUAL model developed by Parasuraman et al. (1985) is one of the most used for this purpose and assesses five dimensions: tangibility, reliability, assurance, responsiveness and empathy. These tools allow universities to evaluate the perceived quality of service and identify areas of improvement. Elliot and Shin (2002) proposed another model which included campus life, academic advising, climate, safety, and service quality, while Rowley (2003) identified the main dimensions as faculty, teaching techniques, administration, infrastructure, and enrollment.

Perceptions of service quality are a major contributor to the degree of student satisfaction (Lassar et al., 2000). Several academic dimensions such as faculty qualifications and relevant curricula, as well as non-academic dimensions (e.g. infrastructure, extracurricular offerings, administrative support) are encompassed in service quality (Hameed and Amjad, 2011). Pors (2001) states that student perceptions are a significant measure for determining quality teaching. Louden (2000) goes one step further and suggests teachers should endorse continued professional development to ensure educational quality. Hill et al. (2003) expand on this area of inquiry, emphasizing the teacher's role to nurture positive student interactions, create and deliver suitable feedback, and

provide clear communication regarding standards. Collectively, these components of teaching are actions on their own, but the pedagogical dimensions addressed above, also inform an overall perception of educational value, hence directly influencing overall satisfaction.

Outside of teaching quality, structural dimensions can also significantly affect satisfaction. Sohail and Shaikh (2004) reveal a positive relationship between perceptions of service quality and physical or technological infrastructure. The physical state of a campus, for example campus appearance, cleanliness, classroom condition and availability to campus related technology, all factor into the student experience. Aldridge and Rowley (1998) primarily cite three components of academic facilities, such as library, laboratories and technological facilities—have significant impacts on students' learning experiences, although LeBlanc and Nguyen (1997) suggest accessibility, as well as frequent interaction with these facilities increases satisfaction. Academic advising also plays an important role for students. Peterson et al. (2001) and Helgesen and Nesset (2007) suggest when academic advising is a part of student learning, it helps students create and define educational and career goals, which ultimately leads to higher assessment of satisfaction and retention.

Financial issues also impact satisfaction. As the market for higher education has become increasingly competitive, the characteristics of scholarship options, loans, and tuition may have a much greater influence on students' perceptions of service quality. Lassar et al. (2000) and Gamage et al. (2008) observe that the availability of financial support makes students more likely to enroll in and persist at a university. Ford et al. (1999) endorse this perspective by stating that reasonable tuition prices can improve perceived service quality and illustrate the importance of value-for-money in student satisfaction.

The institutional image is another key consideration in predicting student satisfaction. According to Andreassen and Lindestad (1998), image is based on prior experiences and communication, which creates a "halo effect" that leads to assessments of satisfaction. In higher education, Telford and Masson (2005) confirmed that institutional image is one of the strongest predictors of student satisfaction and loyalty. Satisfied students are often ambassadors for their institution, generating positive word-of-mouth, and enhancing the reputation of the university (Helgesen and Nesset, 2007).

In the context of a highly competitive international education environment, universities will need to employ strategic planning that prioritizes student satisfaction in order to sustain themselves in the market. Satisfaction affects student retention, recruitment and ultimately the success of students (DeShields et al., 2005). Receiving feedback from students is also essential in improving service quality and meeting students' needs and expectations of what the universities offer (Rowley, 2003). As Telford and Masson (2005) state, satisfaction is an important measure of institutions' effectiveness and a stimulus for strategic planning and development, and should therefore be embedded within universities' mission, priorities, and strategic planning.

3. RESEARCH METHODOLOGY

3.1. Data Collection and Sample

In this quantitative research, the researcher utilized an online questionnaire to collect data for the purpose of assessing the degree to which service quality impacts students' overall satisfaction. The selection of this data collection approach is thoughtful and appropriate. First, digital surveys are incredibly easy for the participant and the researcher (Frippiat and Marquis, 2010). They facilitate the rapid rate of responses from one-to-many individuals, which allows for a larger and representative dataset within a limited time to construct the database.

Since the survey is conducted online, it lessens the impact of geographical restrictions, allowing people to respond from any location and at any time to respond in the manner they prefer. However, along with the benefits of online surveys, the approach has obvious disadvantages. For example, sampling bias is a concern, as only those individuals with sufficient internet access are able to respond and some populations may be excluded because they do not have reliable internet access. Also, the response rate may be low, potentially introducing non-response bias. Finally, while online comfort and anonymity often encourage less restrained participation and possibly more honesty and conviction in their responses, it is also difficult to substantiate or verify if the responses are accurate or true. These limitations must be considered when evaluating and interpreting the results for the study (Gamage et al., 2008).

To mitigate the above limitations, participants were selected through stratified random sampling to help ensure that the sample represented the overall student population across key demographic variables, including age, gender, level of study, and academic major. This approach helped ensure that sampled students had relevant academic experience and enabled meaningful analysis of the research objectives.

A total of 956 students completed the online questionnaire. This sample size was sufficient to support reliable statistical analysis and adequate power for the planned regression analyses. Overall, the study goal was to build a conceptual model to assess the relationship between service quality and student satisfaction across cognitive, emotional, and behavioural dimensions. Student satisfaction was examined from a service-quality-dimensions perspective using the HESQUAL scale (Teeroovengadum et al., 2019).

The HESQUAL scale is a valid and reliable means of measuring service quality in higher education, consisting of 26 items representing five factors: Academic Environment, Reputation, Administrative Services, Campus Facilities, and Teaching and Learning. Responses were collected using a 5-point Likert scale, allowing participants to express their level of agreement with statements related to these areas of educational service quality.

The HESQUAL scale was originally created for assessing service quality in higher education broadly; however for the purposes of this study the HESQUAL scale was adapted to include items

that focused on students' perceptions of service quality related to academic performance, institutional reputation, and general satisfaction. HESQUAL is a reliable scale that is widely used in higher education research, and so it provided valid and reliable measures for the study.

In this study, we assumed a maximum margin of error of 4.06% and a 95% confidence level ($P \leq 0.05$). In order to address bias in responses and procedures, we included several safeguards in the survey design and data analysis. We treated late respondents as proxies for non-respondents to check for non-response bias, and our analyses indicated no significant differences between early and late respondents. We also conducted Harman's single-factor test (Podsakoff et al., 2003) to test for common method bias. The factor analysis produced three distinct factors with none accounting for appreciably more variance than others (DeShields et al., 2005), which makes common method bias unlikely in this research.

3.2. Hypothesis Development

This section will outline and justify the research hypotheses based on the conceptual model adopted from the theoretical framework and influenced by the HESQUAL model (Teeroovengadum et al., 2016; Teeroovengadum et al., 2019). These hypotheses propose examining the different dimensions of service quality in higher education and overall student satisfaction. We contend, based on existing frameworks or theories, such as service quality models, customer satisfaction theory, and stakeholder theory, that the various predictors of service quality are significant predictors of student satisfaction.

3.2.1. Hypothesis H_1: The influence of administrative quality on student satisfaction

Administrative quality is a very specific type of perceived service quality in higher education. It includes not only the efficiency of administrative processes but also, to a lesser extent, the disposition of administrative staff. The effective administration of academic procedures—including enrollment, examinations, records, and institutional communications—together with positive staff-student interactions, encourages an environment of trust and anticipation. Consistent with past service quality research (Parasuraman et al. 1988; Teeroovengadum et al. 2019), it is posited that administrative quality has a direct, positive influence on student satisfaction.

- H_1: Administrative quality influences student satisfaction
- H_{1a}: Administrative processes influence student satisfaction
- H_{1b}: The attitude of administrative staff influences student satisfaction.

3.2.2. Hypothesis H_2: The influence of transformative quality on student satisfaction

Transformative quality refers to the institution's capacity to engender positive change among its students in intellectual, emotional, and professional domains. It reflects the value added through an educational experience in the ways of knowledge, skills, and self-identity.

Previous literature has shown that institutions that provide meaningful and transformative learning experiences and, therefore, greater student satisfaction (Massarini et al., 2019; Douglas et al., 2006). As a result, the following hypothesis is proposed:

- H_2: Transformative quality positively influences student satisfaction.

3.2.3. Hypothesis H_3: The influence of support facilities quality on student satisfaction

Support services and facilities, including libraries, IT services, study spaces, and academic guidance offices, are fundamentally important to the broader learning experience. Services that are accessible and up-to-date, as well as efficient, improve perceptions of service quality and enhance student satisfaction. Previous studies have shown a strong connection between the quality of support facilities and satisfaction levels (Douglas et al., 2006; Sohail and Shaikh, 2004). Thus, we make the following hypothesis:

- H_3: The quality of support facilities influences student satisfaction.

3.2.4. Hypothesis H_4: The influence of teaching staff quality on student satisfaction

The teaching staff is the heart of the educational process and is a key determinant of students' perceptions about the service quality perceived. The teaching staff's capabilities, methods of instruction, design of their curricula, and perspectives of the learner will affect all aspects of the learning environment and experience. Skilled and enthusiastic teachers employing constructive initiatives and demonstrating positive teacher-to-learner rapport significantly contribute to engagement and satisfaction for students (Hill et al., 2003; Teeroovengadum et al., 2019). Therefore, we propose the following hypotheses:

- H_4: Teaching staff quality influences student satisfaction
- H_{4a}: Teacher competence influences student satisfaction
- H_{4b}: Pedagogical approach influences student satisfaction
- H_{4c}: Curriculum design influences student satisfaction
- H_{4d}: Teacher attitude influences student satisfaction.

3.2.5. Hypothesis H_5: The influence of physical environment quality on student satisfaction

The physical environment, including infrastructure, learning spaces, and related support facilities, greatly influences students' perceptions of service quality. A pleasant, inviting, and well-kept environment enhances students' experience of education in a positive way. As further detailed by Bitner (1992) and (Hill et al., 2003), the physical environment influence emotions and can increase students' overall feelings of belonging and satisfaction. Thus, from this perspective the following hypotheses are developed:

- H_5: The quality of the physical environment influences student satisfaction
- H_{5a}: The quality of support facilities influences student satisfaction
- H_{5b}: General infrastructure influences student satisfaction
- H_{5c}: The learning environment influences student satisfaction.

3.2.6. Hypothesis H_6: The influence of e-service quality on student satisfaction

In recent years, the rising digitalization of higher education has emphasized the importance of e-service quality as a significant

contributor to student satisfaction. As more universities rely on the web to provide administrative, pedagogical, and support services, the quality of these interactions is central to students' higher education experience. E-service quality includes four dimensions: responsiveness, personalization, reliability, and ease of use (Sohail and Shaikh, 2004; Teeroovengadum et al., 2019). Research has shown that e-service quality leads to stronger levels of perceived institutional performance and satisfaction, which come from convenience, trust, and emotional engagement (Cam et al., 2024; Teeroovengadum et al., 2019). i.e., if electronic systems are unreliable, impersonal, or difficult to use, those factors may erode satisfaction, even if service performance elsewhere in the institution (i.e. teaching, administrative service/effectiveness) is high. In this regard, e-service quality is both a functional and experiential consideration of the overall construct of perceived service quality that informs students' evaluations and feelings toward the institution (Teeroovengadum et al., 2016). Building on the research body, the current study argues that the higher the perceived quality of electronic services from the university, the greater the perceived level of student satisfaction.

- H_6: E-service quality influences student satisfaction.

4. RESULTS AND DISCUSSION

4.1. Measurement Model Assessment

The measurement model's reliability and validity were assessed following Hair et al. (2019). The reliability of the indicators was confirmed as all standardized loadings were above 0.70. This indicates that each construct explains over half of the variance of its indicators. Overall, all loadings were significant, providing support for indicators' reliability.

Cronbach's Alpha (α) and Composite Reliability (CR) were utilized to confirm internal consistency. All the constructs' α and CR coefficients were well above their 0.70 threshold, with the α values ranging from 0.781 to 0.942 and CR values from 0.788 to 0.942. Overall, this demonstrates satisfactory internal consistency among the indicators and shows no redundancy, indicating the reliability of the measurement scales.

Convergent validity was evaluated by calculating Average Variance Extracted (AVE). Construct AVE values ranged from 0.596 to 0.850, exceeding the 0.50 standard of convergent validity. We validated discriminant validity using the Fornell–Larcker criterion and cross-loadings. The square root of the AVE for all constructs was higher than the inter-construct correlations, along with the observed indicators loading higher on their respective construct than any cross-loadings on any other construct. This demonstrates the distinctiveness of the latent variables. The reliability and validity results for all constructs are presented in Table 1.

All standardized factor loadings had $P < 0.001$. Additionally, the Cronbach's α and Composite Reliability values were above 0.70, indicating strong internal consistency. Furthermore, all Average Variance Extracted (AVE) values were above 0.50 indicating convergent validity (Hair et al., 2019).

All construct parameters were estimated and depicted in the structural model output generated by SmartPLS 4 (Figure 1).

4.2. Structural Model Evaluation

The structural model was evaluated through Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4. The analysis of the measurement model began once the indicator reliability, convergent validity, and discriminant validity indicated that the measurement model was sufficient to move to hypothesis testing of the proposed causal relationships among latent constructs.

The assessment of global model fit produced appropriate results. Specifically, the standardized root mean square residual (SRMR) was below the recommended cutoff of 0.08, again indicating that the model fits the empirical data reasonably well as a small SRMR value indicates little variance between observed values and estimated correlations. Results indicate that the model has a reasonable degree of predictive accuracy and also reflects the theoretical relationships proposed.

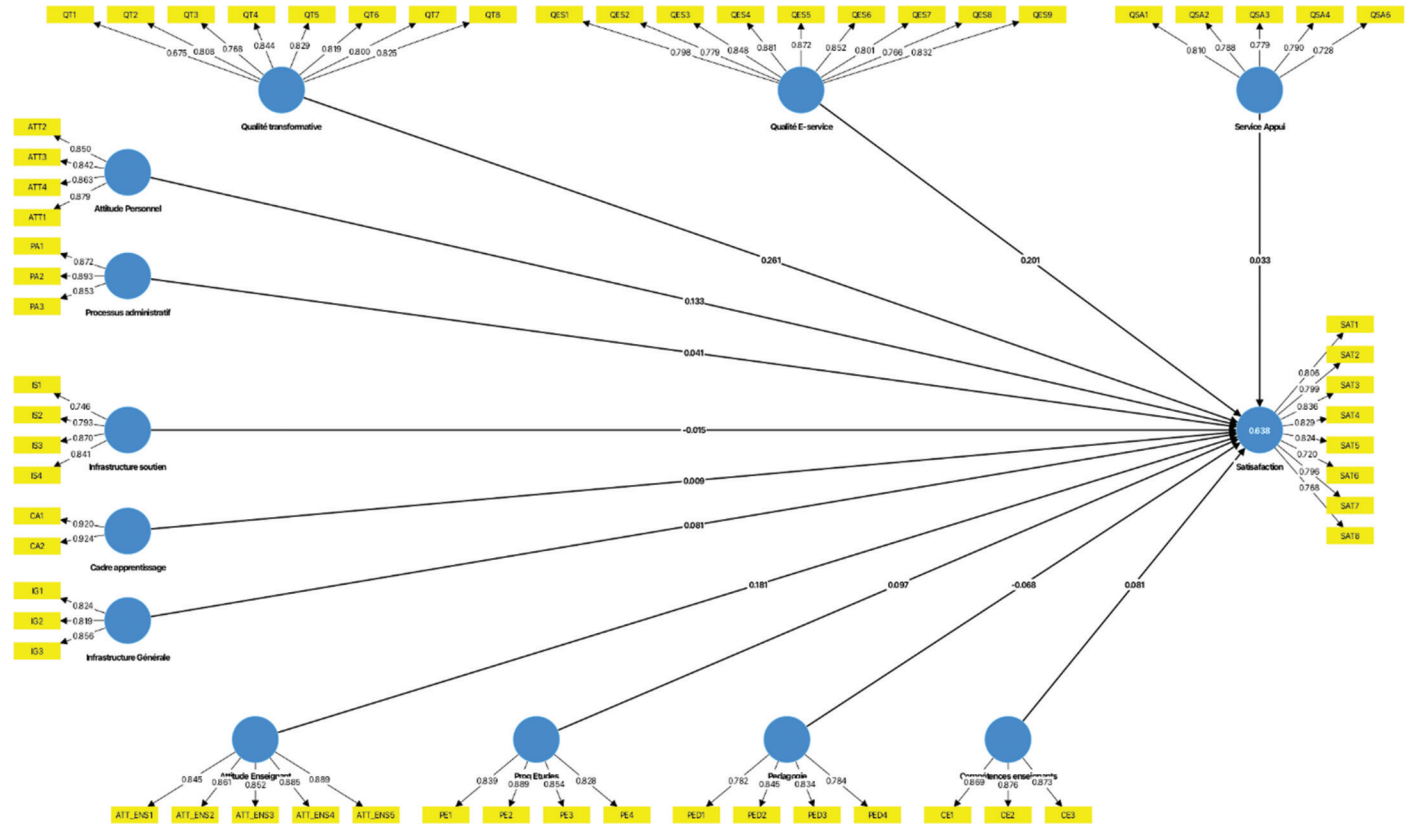
To confirm the validity of the regression estimates, collinearity diagnostics were computed. All the Variance Inflation Factor (VIF) values were well below the critical cutoff of 5, indicating that

Table 1: Reliability and validity of constructs

Construct	Number of items	Factor loading range	Cronbach's α	Composite reliability (CR)	Average variance extracted (AVE)
Administrative Process	4	0.74-0.88	0.812	0.853	0.596
Administrative Staff Attitude	5	0.71-0.86	0.841	0.876	0.639
Teacher Competence	4	0.75-0.90	0.842	0.886	0.660
Pedagogy	3	0.79-0.89	0.828	0.874	0.698
Study Program	3	0.73-0.87	0.801	0.857	0.602
Teacher Attitude	4	0.72-0.89	0.835	0.882	0.652
Support Facilities	4	0.76-0.88	0.849	0.890	0.621
General Infrastructure	4	0.78-0.91	0.861	0.903	0.704
Learning Environment	3	0.84-0.93	0.902	0.936	0.850
Transformative Quality	3	0.79-0.88	0.831	0.879	0.646
E-Service Quality	4	0.83-0.92	0.920	0.942	0.762
Support Service Quality	3	0.74-0.88	0.781	0.788	0.608
Student Satisfaction	4	0.80-0.92	0.893	0.920	0.742

Source: Authors

Figure 1: Structural model estimates



Source: Authors

multicollinearity was not a concern among the exogenous constructs. Thus, all predictors uniquely contribute to explaining the variance in student satisfaction, increasing the interpretability and stability of the estimated path-coefficients. Also, the bootstrapping with 5,000 subsamples was used in assessing the statistical significance of the path coefficients. This resampling procedure provides more accurate measures of standard errors and confidence intervals, as well as minimizes Type I and Type II error in a complex model.

Finally, the estimation of all parameters for every construct and the inter-relationships between them is presented visually in a path diagram produced by SmartPLS 4, which indicates both direct and indirect effects between the different dimensions of service quality, while also indicating student satisfaction. The path diagram provides a clear visual interpretation of the hypothesized relationships and enhances the conceptualization of the structural dependencies in the model.

4.3. Hypothesis Testing

After validating the measurement model, we proceeded to examine the structural model to determine the hypothesized relationships between the antecedents of service quality and student satisfaction. We used the PLS-SEM approach to analyze the structural model using SmartPLS 4.

Table 2 summarizes the results of the first-order model which provides the path estimates (O), standard deviations (STDEV), t-values, and P-values for each hypothesized relationship. A path is considered significant when the t-value is >1.96 ($P < 0.05$), which shows statistical significance at the 5% level of significance.

The evaluation of the hypothesized relationships revealed that seven of the twelve direct paths were statistically significant, confirming the strength of the proposed theoretical framework. The results suggest that the framework of student satisfaction is complex, and not all dimensions of service quality are created equal.

With respect to administrative quality, the results were unequivocal with regard to the complexity of its subdimensions. The administrative process did not make a statistically significant contribution to student satisfaction, indicating that efficiency of service is not a sufficient condition to increase perceived satisfaction. The findings are consistent with past research stating that if human interactions are absent, or impersonal, transactional or procedural service is often of secondary consideration (Parasuraman et al. 1988; Brochado, 2009).

Administrative staff's characteristic had a sizable and statistically significant effect. Professional, responsive, and caring interactions with administrative staff are necessary to achieve positive student experiences. These findings support the SERVQUAL framework that quality is dependent on the human dimension of service delivery, and has also been supported by the HEdPERF model that recognized staff responsiveness and fairness as key variables associated with the perceived quality of higher education (Firdaus, 2005). This finding suggests that universities have an obligation

Table 2: Structural model path coefficients and hypothesis testing results

Hypothesis	Original sample (O)	Standard deviation (STDEV)	T-Value	P-value	Decision
H_{1a}: Administrative Process→SAT	0.041	0.028	1.478	0.140	Rejected
H_{1b}: Staff Attitude→SAT	0.133	0.031	4.284	0.000	Supported
H_{2}: Transformative Quality→SAT	0.261	0.031	8.441	0.000	Supported
H_{3}: Support Services→SAT	0.033	0.031	1.043	0.297	Rejected
H_{4a}: Teacher Competence→SAT	0.081	0.030	2.664	0.008	Supported
H_{4b}: Pedagogy→SAT	−0.068	0.038	1.771	0.077	Rejected
H_{4c}: Study Programs→SAT	0.097	0.038	2.571	0.010	Supported
H_{4d}: Teacher Attitude→SAT	0.181	0.032	5.615	0.000	Supported
H_{5a}: Support Facilities→SAT	−0.015	0.029	0.524	0.600	Rejected
H_{5b}: General Infrastructure→SAT	0.081	0.029	2.788	0.005	Supported
H_{5c}: Learning Environment→SAT	0.009	0.031	0.294	0.769	Rejected
H_{6}: E-Service Quality→SAT	0.201	0.030	6.692	0.000	Supported

Source: Authors

to streamline administrative processes, as well as, develop staff relational skills that contribute towards the overall satisfaction of students.

Transformative quality was among the strongest effects on student satisfaction and highlights the responsibility of higher education institutions to foster personal development, critical thinking, innovation, and employability. This finding aligned with the findings of the HESQUAL framework that stated that both functional and transformative objectives are equally important within that form of education (Teeroovengadum et al., 2016; Teeroovengadum et al., 2019). Through the use of modern pedagogies such as AI-based learning tools and digital platforms for collaborative learning, institutions can provide transformative learning experiences that greatly contribute to the overall satisfaction of students. These findings indicate that higher education irreducibly is about transforming students; therefore, higher education institutions no longer can be seen as a simple service provider, but instead a transformative agent of students' intellectual and professional identities (Brochado, 2009; Huang, 2009).

The aspect of support services did not contribute significantly to the overall student satisfaction scores, which leads to the suggestion that these types of services are not factors in students' qualitative judgement or satisfaction until a threshold of necessity is achieved for the effectiveness of their learning experience. This finding is also consistent with other research, which has indicated that support services are not prioritized compared to "core" elements of education (Douglas et al., 2006; Marzo-Navarro et al. 2005). This implies that if universities build support services into their educational programs, they may be able to illustrate the normalization of supporting services.

The findings for the teaching quality aspect were mixed. Teacher effectiveness, relevance to the educational program, and teacher disposition had a significant positive impact on student satisfaction, and could possibly be considered contributors to higher satisfaction (Elliot and Shin, 2002; Hill et al., 2003). However, the pedagogical methods aspect had no statistical impact. This question conflates with a teacher pedagogical method may not increase satisfaction until the pedagogical method is entertained and productive interactions occurred. This also echoes earlier research studies that highlighted that the authenticity and effective pedagogy rely as much on the relational and contextual elements of pedagogical methods as on the pedagogical methods themselves (Louden, 2000; Pors, 2001).

Regarding the physical environment, only general infrastructure had a statistically significant effect on student satisfaction. Presumably, the presence of functional, well-kept facilities serves as a positive indicator for students' interpretation of their learning environment; the support facilities and broader learning environment were not significant. This perception may reflect students' increasing use of digital platforms that have made physical spaces less relevant (Sohail and Shaikh, 2004). These findings suggest there are more demonstrable outcomes on satisfaction associated with investments in visible and functional infrastructure than with investments in less frequently used facilities, or types of specialized facilities.

Finally, e-service quality had a strong and statistically significant effect on student satisfaction, which exhibits that the growth of digital platforms, online administrative systems, and AI tools will become increasingly important in higher education, if it has not already. Digital services that in their thoughtfulness are efficient, usable, and accessible support convenience, increase accessibility, and present the impression of institutional responsiveness, which positively shapes student satisfaction. These results align with a growing body of literature that advocates for the importance of digital services in higher education institutions, both strategically and instrumentally, especially if institutions are expected to support seamless and responsive digital access to services (for example, Cam et al., 2024).

5. CONCLUSION

This research showcases a robust construct of how students' satisfaction is formed through various aspects of service quality within higher education institutions. Building on the research of the existing constructs, SERVQUAL (Parasuraman et al., 1988), HEdPERF (Firdaus, 2005), and HESQUAL (Teeroovengadum et al., 2016; Teeroovengadum et al., 2019), the reconfigured conceptual framework proposed in this study suggests that service quality is formative, comprising the factors of administrative quality, academic quality, physical quality, and digital quality. The

PLS-SEM analysis lends credence to our proposed conceptual framework, as seven of the twelve proposed hypothesized relationships were supported at statistically significant levels. Overall, the findings indicate that students' satisfaction occurs from a complex interplay of human, organizational, and digital, indicative of the complexity of higher education service ecosystems.

The findings reveal that transformative quality, e-service quality, and attitudes of administrative and teaching staff are the most salient factors influencing students' satisfaction. That is, in addition to education quality, and institutional reputation, the nature of the relationships and the effectiveness of digital interfaces clearly play pivotal roles in influencing students' evaluations of institutional performance. Moreover, that some dimensions were found to be not significant (support services or pedagogical practices) shows that students emphasize interpersonal, and transformative quality towards the learning experiences, instead of indirect (peripheral) or additionally procedural dimensions of learning experiences. This highlights the need for universities to focus on meaningful interactions and creating value with students, rather than an emphasis on process efficiency.

On a conceptual level, this study contributes to the literature by progressively advancing the traditional perspective on service quality in higher education. It confirms and develops the HESQUAL model by evaluating both the human and digital dimensions in the analysis of the perceived quality of the service. By doing so, it acknowledges that the student experience is both functional and experiential. The study also reaffirms the crucial role of transformative quality as its net influence on satisfaction, reaffirming that universities should not only be conceptualised as professionals of education but as transformative agents of intellectual, personal, and professional development. Additionally, this study situates itself within the contemporary discourse on the digital transformation of higher education by evaluating e-service quality as a significant contributor to satisfaction whilst also contributing to the ongoing discourse around hybrid models of learning which are predicated on interdependence between physical and digital experiences.

The research provides several managerial implications for higher-education leaders and policymakers within higher education. Universities must adopt a more holistic approach in management of services, incorporating the human interaction, with digital engagement, to the pedagogical transformation. Central to the positive enhancement of student experience, is the training and continual enhancement of staff social skills, including, empathy, responsiveness, and communication. Higher education must also have a strategic focus to invest in the quality of reliability, responsiveness and ease of use of their digital services, as students are now interacting with their institution daily, with the majority occurring in digital pacing. Ensuring transformative quality will also be essential to enhancing institutional image, and developing student loyalty, which is key in order for ongoing development of programs that are relevant, innovative pedagogical practice, as well as continuing emphasis on employer outcomes. While it is still an area to be considered, the study suggests that it is likely that the human and digital, facilitate more immediate potential lasting behaviours towards satisfaction than actual physical facilities.

Considering this, further research would be useful in examining whether these findings are transferable beyond the current cultural, geographical, and institutional contexts. Comparative research among public and private universities and between traditional and digital-first institutions would provide additional insight into whether the determinants of student satisfaction differ according to structural, cultural, and/or technological contexts. It would be useful to consider longitudinal research on student satisfaction in the larger academic journey of students to help understand how students' shift or evolve in satisfaction as they move through their experiences, including whether different aspects of service quality change in importance over time.

In addition, further understanding of the service quality and satisfaction construct can evolve by looking at mediating or moderating variables such as student engagement, trust, or institutional image. Expanding the construct even further to include other stakeholders in the student journey such as faculty, employers, or alumni, could provide an even more well-rounded understanding and value co-creation within the higher education space. Lastly, looking at the usage of more general technological advances, such as AI-enhanced learning platforms or adaptive educational technologies, (i.e., "smart" e-learning), can help us understand the role of technology on perceived service quality and overall student satisfaction within higher education contexts.

REFERENCES

Aldridge, S., Rowley, J. (1998), Measuring Customer satisfaction in higher education. Quality Assurance in Education, 6(4), 197-204.

Andreassen, T.W., Lindestad, B. (1998), Customer loyalty and complex services: The impact of corporate image on quality, customer satisfaction and loyalty for customers with varying degrees of service expertise. International Journal of Service Industry Management, 9(1), 7-23.

Arif, S., Ali, F. (2023), Stakeholder perspectives on quality management in universities. Journal of Higher Education Policy and Management, 45(2), 123-138.

Bitner, M.J. (1992), Servicescapes: The impact of physical surroundings on customers and employees. Journal of Marketing, 56(2), 57-71.

Brochado, A. (2009), Comparing alternative instruments to measure service quality in higher education. Quality in Higher Education, 15(3), 207-220.

Cam, M., Efe, I., Yilmaz, M.B. (2024), Perceived service quality in higher education: A global perspective. Journal of Educational Management, 38(1), 45-62.

Carey, K., Cambiano, R., De Vore, J. (2002), Measuring student satisfaction. Journal of College Student Retention, 4(2), 129-143.

Cronin, J.J., Taylor, S.A. (1992), Measuring service quality: A reexamination and extension. Journal of Marketing, 56(3), 55-68.

DeShields, O.W.Jr., Kara, A., Kaynak, E. (2005), Determinants of business student satisfaction and retention in higher education: Applying Herzberg's two-factor theory available to purchase. International Journal of Educational Management, 19(2), 128-139.

Douglas, J., McClelland, R., Davies, J. (2006), Assessing the first year student experience in higher education. Quality in Higher Education, 12(1), 33-52.

Elliot, K.M., Shin, D. (2002), Student satisfaction: An alternative approach to assessing this important concept. Journal of Higher Education Policy and Management, 24(2), 197-209.

Firdaus, A. (2005), HEdPERF versus SERVPERF: The quest for ideal measuring instrument of service quality in higher education sector. International Review of Business Research Papers, 1(2), 1-10.

Ford, R.C., Joseph, M., Joseph, B. (1999), Importance-performance analysis as a strategic tool for service marketers: The case of service quality perceptions of business students in New Zealand and the USA. Journal of Services Marketing, 13(2), 171-186.

Frippiat, D., Marquis, N. (2010), Les enquêtes par Internet en sciences sociales: Un état des lieux. Population, 65(2), 309-338.

Gamage, D.T., Suwanabroma, J., Ueyama, T., Hada, S., Sekikawa, E. (2008), The impact of quality assurance measures on student services at the Japanese and Thai private universities. Quality Assurance in Education, 16(2), 181-198.

Hair, J.F., Risher, J.J., Sarstedt, M., Ringle, C.M. (2019), When to use and how to report the results of PLS-SEM. European Business Review, 31(1), 2-24.

Halai, N. (2013), Managerial approaches in higher education. International Journal of Management in Education, 7(2), 105-118.

Hameed, A., Amjad, S. (2011), Factors affecting student satisfaction in higher education. International Journal of Business and Social Science, 2(20), 275-281.

Harvey, L., Williams, J. (2010), Fifteen years of quality in higher education. Quality in Higher Education, 16(1), 3-36.

Helgesen, Ø., Nesset, E. (2007), What accounts for students' loyalty? Some field study evidence. International Journal of Educational Advancement, 7(1), 19-41.

Hill, F., Lomas, L., MacGregor, J. (2003), Students' perceptions of quality in higher education. Quality in Higher Education, 9(1), 1-15.

Huang, F. (2009), Measuring service quality in higher education: A comparative study of HEdPERF and SERVPERF. International Journal of Educational Management, 23(2), 171-184.

Johnston, R., Silvestro, R. (1990), Understanding service quality: Applying the SERVQUAL approach. European Journal of Marketing, 24(2), 35-53.

Kankhuni, L., Balderas, F.E. (2023), The student as client debate: Implications for higher education. Journal of Higher Education Studies, 13(1), 55-68.

Kotler, P., Clarke, R.N. (1987), Marketing for Health Care Organizations. Englewood Cliffs, NJ: Prentice Hall.

Lassar, W., Manolis, C., Lassar, S. (2000), Service quality perspectives and satisfaction in higher education. Journal of Services Marketing, 14(6), 452-471.

LeBlanc, G., Nguyen, N. (1997), Searching for excellence in business education: An exploratory study of customer impressions of service quality. International Journal of Educational Management, 11(2), 72-78.

Louden, W. (2000), Teaching quality and student satisfaction in higher education. Journal of Education for Teaching, 26(3), 227-237.

Masserini, L., Bini, M., Pratesi, M. (2019), Do quality of services and institutional image impact students' satisfaction and loyalty in higher education? Social Indicators Research, 146, 91-115.

Marzo-Navarro, M., Pedraja-Iglesias, M., Rivera-Torres, P. (2005), A new management element for universities: Satisfaction with the offered courses. International Journal of Educational Management, 19(6), 505-526.

McElwee, G., Redman, T. (1993), Using Servqual to measure the quality of student services. European Journal of Marketing, 27(3), 33-49.

Oliver, R.L. (1980), A cognitive model of the antecedents and consequences of satisfaction decisions. Journal of Marketing Research, 17(4), 460-469.

Palacio, A., Meneses, G., Perez, M. (2002), The development of student expectations before university entry. Quality in Higher Education, 8(2), 161-172.

Parasuraman, A., Zeithaml, V.A., Berry, L.L. (1985), A conceptual model of service quality and its implications for future research. Journal of Marketing, 49(4), 41-50.

Parasuraman, A., Zeithaml, V.A., Berry, L.L. (1988), SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. Journal of Retailing, 64(1), 12-40.

Peterson, R.M., Wagner, J., Lamb, C.W. (2001), Academic advising and student satisfaction. Journal of College Student Retention, 3(1), 45-59.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., Podsakoff, N.P. (2003), Common method biases in behavioral research: A critical review of the literature and recommended remedies. Journal of Applied Psychology, 88(5), 879-903.

Pors, N. (2001), Evaluating teaching quality from a student perspective. Quality in Higher Education, 7(2), 123-134.

Rowley, J. (2003), Designing student feedback systems. Quality in Higher Education, 9(1), 3-21.

Sohail, M., Shaikh, F. (2004), Service quality in higher education: A student perspective. Quality Assurance in Education, 12(1), 15-25.

Teeroovengadum, V., Seetanah, B., Soopramanien, D. (2016), HESQUAL: Measuring service quality in higher education. Quality in Higher Education, 22(1), 22–44.

Teeroovengadum, V., Seetanah, B., Soopramanien, D. (2019), Transformative quality as a predictor of student satisfaction. Journal of Further and Higher Education, 43(4), 537-555.

Telford, R., Masson, R. (2005), Student satisfaction with higher education. Higher Education, 50(1), 1-17.

Wisniewski, M. (2001), Using SERVQUAL to assess student perceptions of service quality in higher education. Quality in Higher Education, 7(1), 59-66.

Zammuto, R.F., Keaveney, S.M., O'Connor, E.J. (1996), Rethinking student services: Assessing and improving service quality. Journal of Marketing for Higher Education, 7(1), 45-70.