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How Service Quality Shapes Satisfaction, Institutional Image, and Loyalty among Postgraduate Students

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ABSTRACT

Higher education institutions increasingly depend on service quality to sustain student relationships, strengthen institutional reputation, and encourage positive post-study behavior. This study examines how the five SERVQUAL dimensions - tangibles, reliability, responsiveness, assurance, and empathy - shape student satisfaction and how satisfaction subsequently influences institutional image and student loyalty. A quantitative cross-sectional survey was conducted among 275 active postgraduate students at the Faculty of Economics and Business, Universitas Negeri Jakarta. Respondents were selected proportionally from six master and doctoral programs, and the data were analyzed using partial least squares structural equation modeling. All measurement constructs demonstrated satisfactory indicator reliability, convergent validity, internal consistency, and discriminant validity. The structural results show that all five service-quality dimensions positively and significantly affect student satisfaction. Responsiveness produced the strongest effect (beta = 0.299), followed by tangibles (beta = 0.264), empathy (beta = 0.216), reliability (beta = 0.210), and assurance (beta = 0.162). Student satisfaction strongly improved institutional image (beta = 0.599) and directly increased loyalty (beta = 0.409), while institutional image also strengthened loyalty (beta = 0.403). The findings position responsive service and student experience as central mechanisms for building reputation and long-term relationships in postgraduate education.

Keywords: SERVQUAL; higher education; partial least squares; relationship marketing; Indonesia

1. INTRODUCTION

Universities operate in an environment where students evaluate not only teaching outcomes but also the complete bundle of academic, administrative, technological, and interpersonal services received throughout their studies. These evaluations are strategically important because they influence whether students consider the institution dependable, whether they describe their educational experience positively, and whether they maintain a relationship with the university after graduation. In postgraduate education, the service challenge is particularly pronounced. Many students combine study with employment, entrepreneurship, family responsibilities, and professional commitments; consequently, they require accurate information, flexible access, reliable digital systems, and rapid responses to academic and administrative needs.

Service quality has therefore become an institutional capability rather than a peripheral support activity. The SERVQUAL framework conceptualizes perceived quality through tangibles, reliability, responsiveness, assurance, and empathy (Parasuraman et al., 1988). Although the framework originated in commercial services, it has been applied extensively to higher education because students interact with physical facilities, learning resources, digital platforms, lecturers, administrators, and institutional procedures. Studies across different national settings generally show that service quality is associated with satisfaction and loyalty, but the relative importance of individual dimensions is not uniform (Bwachele et al., 2023; Elahinia and Karami, 2019; Sibai et al., 2021). This variation suggests that institutions need evidence about specific service attributes instead of relying only on an aggregate quality score.

Student satisfaction represents an overall evaluation of educational experience. It reflects whether services, learning conditions, institutional interactions, and the decision to enroll are judged positively (Elliott and Healy, 2001; Gruber et al., 2010; Wong and Chapman, 2023). Satisfaction is economically and managerially consequential because dissatisfied students can generate negative word of mouth, weaken retention, and reduce willingness to participate as alumni. Conversely, satisfied students are more likely to develop favorable attitudes toward the institution and to recommend it to others (Borishade et al., 2021; Chandra et al., 2018).

Institutional image is another strategic asset. It summarizes cognitive judgments about reputation, professionalism, program quality, graduate prospects, and academic credibility, together with affective reactions toward the institution (Brown and Mazzarol, 2009; Palacio et al., 2002). Image is not created solely through communication campaigns; it is continually reconstructed through lived service experiences. When students receive consistent, responsive, and considerate services, their evaluation of the institution becomes more favorable. A positive image can in turn reinforce loyalty by providing students with confidence, pride, and a socially meaningful reason to remain connected with the university (Mohammed et al., 2023; Seow and Hussain, 2024).

Existing research nevertheless leaves three important gaps. First, many studies model service quality as a single higher-order construct, which limits the ability to identify the operational dimension that should receive priority. Second, the causal ordering among satisfaction, image, and loyalty remains inconsistent. Some studies position image as an antecedent of satisfaction, while others argue that satisfaction formed through actual experience improves image and subsequently supports loyalty (Mesta, 2019; Romero et al., 2023; Wijaya et al., 2021). Third, evidence focusing on postgraduate students in Indonesia remains limited, even though their service requirements differ from those of conventional full-time undergraduates.

This study addresses these gaps by separately testing the five SERVQUAL dimensions as predictors of student satisfaction and by examining the direct effects of satisfaction on institutional image and loyalty, as well as the effect of institutional image on loyalty. The context is the postgraduate unit of the Faculty of Economics and Business, Universitas Negeri Jakarta, which serves students across six master and doctoral programs and combines face-to-face, online, and hybrid learning. The study contributes by identifying the strongest service-quality lever, clarifying the role of satisfaction in forming institutional image, and demonstrating how satisfaction and image jointly support postgraduate student loyalty.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Social Exchange Theory and Service Quality

Social Exchange Theory explains relationships as continuing exchanges in which actors compare benefits received with resources contributed. In educational relationships, students contribute tuition, time, effort, trust, participation, and institutional identification, while the university provides learning, facilities, information, administrative support, professional expertise, and access to academic resources. When this exchange is evaluated positively, reciprocity encourages favorable attitudes and relationship continuity (Blau, 1964; Cropanzano and Mitchell, 2005).

SERVQUAL operationalizes the benefits delivered through the student-institution exchange. Tangibles capture visible and technological evidence of service, including classrooms, libraries, internet access, learning materials, and communication media. Reliability reflects the accurate and consistent fulfillment of promised academic and administrative services. Responsiveness concerns speed, availability, and willingness to help. Assurance reflects competence, courtesy, professionalism, and the ability to inspire trust. Empathy concerns individualized attention and understanding of student circumstances (Parasuraman et al., 1988). Treating these dimensions separately permits a direct comparison of their effects on satisfaction.

2.2. SERVQUAL Dimensions and Student Satisfaction

Tangibles provide students with concrete signals about institutional preparedness and resource commitment. In postgraduate education, these signals include not only buildings and classrooms but also databases, digital learning systems, internet connectivity, current library resources, and professionally presented information. Adequate physical and digital evidence reduces functional obstacles and communicates that the institution is capable of supporting advanced study. Prior studies have linked tangible resources to satisfaction, although their magnitude varies by learning context (Bwachele et al., 2023; Leonard, 2018; Sibai et al., 2021).

H1: *Tangibles have a positive effect on student satisfaction.*

Reliability is the institution's capacity to deliver services accurately, consistently, and as promised. For postgraduate students, reliable teaching, correct academic records, predictable procedures, and dependable problem resolution reduce uncertainty and the time cost of study. Reliability is frequently identified as an important satisfaction driver because repeated errors or inconsistent information undermine confidence in the exchange relationship (Bwachele et al., 2023; Mulyono et al., 2020).

H2: *Reliability has a positive effect on student satisfaction.*

Responsiveness concerns the speed and willingness with which lecturers and administrative personnel address requests. It is especially relevant to working postgraduate students, whose academic decisions often depend on timely information about schedules, assessments, supervision, registration, and thesis procedures. Rapid responses reduce waiting costs and demonstrate that the institution values students' time. Evidence from higher education indicates that responsiveness can be among the most influential SERVQUAL dimensions (Sibai et al., 2021; Theresia and Bangun, 2017).

H3: *Responsiveness has a positive effect on student satisfaction.*

Assurance develops when students perceive personnel as knowledgeable, professional, courteous, and trustworthy. Because postgraduate services frequently involve complex academic and administrative decisions, students need confidence that information and advice are accurate. Competent interactions reduce perceived risk and reinforce institutional credibility. Previous studies show that assurance contributes to satisfaction by strengthening trust in service personnel and procedures (Hassan and Shamsudin, 2019; Sibai et al., 2021).

H4: *Assurance has a positive effect on student satisfaction.*

Empathy reflects individualized attention, accessibility, and understanding of student needs. Postgraduate cohorts are heterogeneous in employment status, study stage, program requirements, and personal constraints. Services that consider these differences are more likely to be evaluated as fair and supportive. Although some studies report weaker empathy effects, the broader literature suggests that individualized care can improve satisfaction by signaling relational commitment (Elahinia and Karami, 2019; Leonard, 2018).

H5: *Empathy has a positive effect on student satisfaction.*

2.3. Satisfaction, Institutional Image, and Student Loyalty

Student satisfaction is an overall evaluative response to educational experience. Repeated positive encounters become cognitive evidence that the institution is professional, credible, and capable. Satisfaction should therefore improve institutional image because students use their own experience as a primary information source when judging reputation and quality. Research has found that favorable experiences and satisfaction are closely associated with university image, although the direction of the relationship differs across models (Ali et al., 2016; Brown and Mazzarol, 2009; Romero et al., 2023).

Loyalty in higher education contains attitudinal and behavioral components. Attitudinal loyalty is expressed through pride, commitment, and concern for institutional reputation, while behavioral loyalty is reflected in recommendation, positive communication, continued participation, and preference for future programs. Satisfaction creates a motivation to reciprocate positive treatment and reduces incentives to distance oneself from the institution. Studies in Nigeria, Indonesia, and other settings consistently report a positive satisfaction-loyalty relationship (Borishade et al., 2021; Chandra et al., 2019; Todea et al., 2022).

Institutional image can independently strengthen loyalty. A respected, professional, and emotionally attractive institution provides social and functional value beyond immediate service encounters. Students who believe that their institution has a strong reputation and credible academic standing are more willing to recommend it and preserve a long-term affiliation. Empirical studies have demonstrated direct or mediating effects of image on loyalty (Masserini et al., 2019; Mohammed et al., 2023; Seow and Hussain, 2024).

H6: *Student satisfaction has a positive effect on institutional image.*

H7: *Student satisfaction has a positive effect on student loyalty.*

H8: *Institutional image has a positive effect on student loyalty.*

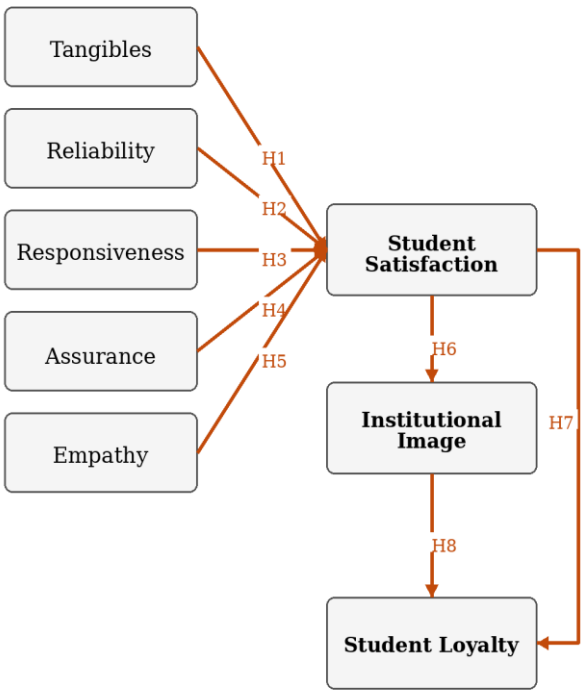


Figure 1. Conceptual Model

3. RESEARCH METHODOLOGY

3.1. Research Design, Population, and Sample

The study used a quantitative, causal-associative, cross-sectional survey design. The population consisted of 878 active postgraduate students in the Faculty of Economics and Business, Universitas Negeri Jakarta, during the 2025 academic reporting period. The population included Master of Accounting, Master of Management, Master of Economic Education, Doctor of Management Science, Doctor of Accounting Science, and Doctor of Business Management students.

The minimum sample was calculated with the Slovin formula using a 5% margin of error, resulting in 274.80 and rounded to 275 respondents. Proportionate random sampling allocated the sample across the six programs: 110 Master of Management students, 39 Master of Accounting students, 7 Master of Economic Education students, 102 Doctor of Management Science students, 10 Doctor of Accounting Science students, and 7 Doctor of Business Management students. Eligible respondents were active students who had completed at least one semester and had used academic or non-academic postgraduate services.

Data were collected through an online questionnaire. Participation was voluntary, respondents were informed that there were no right or wrong answers, and responses were treated confidentially for academic purposes. A six-point Likert scale was used, ranging from 1 (strongly disagree) to 6 (strongly agree). The even-numbered scale was selected to encourage a directional evaluation rather than a neutral midpoint.

3.2. Measurement

The model contained eight reflective constructs measured by 42 indicators. Tangibles used five indicators, reliability three, responsiveness four, assurance four, and empathy five; these measures were adapted primarily from Bwachele et al. (2023), with the SERVQUAL foundation provided by Parasuraman et al. (1988). Student satisfaction was measured through five overall-experience indicators adapted from Hossain et al. (2025) and Ali et al. (2016). Institutional image used ten indicators covering cognitive judgments and affective reactions, adapted from Hossain et al. (2025) and Palacio et al. (2002). Student loyalty used six indicators representing attitudinal and behavioral loyalty, adapted from Ngo et al. (2025). A construct-level summary is provided in Table 1, while the complete English wording of all 42 items is reported in Appendix A to facilitate replication and future adaptation.

Table 1. Measurement Constructs and Main Sources

Construct	Items	Main source(s)
Tangibles	5	Bwachele et al. (2023)
Reliability	3	Bwachele et al. (2023)
Responsiveness	4	Bwachele et al. (2023)
Assurance	4	Bwachele et al. (2023)
Empathy	5	Bwachele et al. (2023)
Student satisfaction	5	Hossain et al. (2025); Ali et al. (2016)
Institutional image	10	Hossain et al. (2025); Palacio et al. (2002)
Student loyalty	6	Ngo et al. (2025)
Total	**42**	—

Note: All items were rated on a six-point Likert scale (1 = strongly disagree; 6 = strongly agree). The original questionnaire was administered in Indonesian.

3.3. Data Analysis

Partial least squares structural equation modeling was performed with SmartPLS. The measurement model was assessed through outer loadings, Cronbach's alpha, rho_A, composite reliability, average variance extracted, the heterotrait-monotrait ratio, the Fornell-Larcker criterion, and cross-loadings. The structural model was assessed through inner variance inflation factors, coefficients of determination, effect sizes, predictive relevance, and bootstrapped path coefficients. A two-tailed 5% significance level was applied; paths were considered significant when t exceeded 1.96 and p was below 0.05.

4. RESULTS AND DISCUSSION

4.1. Respondent Characteristics

All 275 questionnaires were included in the analysis. Men represented 53.45% of respondents and women 46.55%. The two largest program groups were Master of Management (40.00%) and Doctor of Management Science (37.09%). Students in semester four formed the largest semester group (25.82%). Hybrid learning was the most common delivery mode (50.91%), followed by face-to-face learning (32.73%) and online learning (16.36%). Most respondents were employed (54.91%), while 25.45% were entrepreneurs and 19.64% were not employed. This profile confirms the practical importance of flexible, rapid, and digitally supported services.

Table 2. Main Respondent Characteristics

Characteristic	Category	n	%
Gender	Male	147	53.45
Gender	Female	128	46.55
Program	Master of Management	110	40.00
Program	Doctor of Management Science	102	37.09
Delivery mode	Hybrid	140	50.91
Employment	Employed	151	54.91
Employment	Entrepreneur	70	25.45

Source: Primary survey data (2026).

4.2. Measurement Model

All 42 indicators exceeded the 0.70 loading criterion. The lowest loading was 0.835 for an institutional-image indicator, while the highest was 0.940 for an assurance indicator. Cronbach's alpha values ranged from 0.914 to 0.968, composite reliability from 0.946 to 0.972, and average variance extracted from 0.775 to 0.861. These results demonstrate strong indicator reliability, internal consistency, and convergent validity. Discriminant validity was also supported: all HTMT values were below 0.90, with the highest value equal to 0.680 between student satisfaction and student loyalty; the Fornell-Larcker and cross-loading assessments produced consistent conclusions.

Table 3. Measurement Model Assessment

Construct	Items	Loading range	Alpha / CR	AVE
Tangibles	5	0.894-0.932	0.954 / 0.964	0.844
Reliability	3	0.919-0.933	0.914 / 0.946	0.853
Responsiveness	4	0.904-0.926	0.934 / 0.953	0.835
Assurance	4	0.918-0.940	0.946 / 0.961	0.861
Empathy	5	0.906-0.928	0.953 / 0.964	0.843
Student satisfaction	5	0.904-0.932	0.951 / 0.962	0.837
Institutional image	10	0.835-0.913	0.968 / 0.972	0.775
Student loyalty	6	0.887-0.926	0.957 / 0.965	0.822

Source: Authors' calculations from SmartPLS output (2026).

4.3. Structural Model and Hypothesis Testing

Inner VIF values ranged from 1.000 to 1.560, indicating that collinearity did not threaten the structural estimates. The five SERVQUAL dimensions jointly explained 47.9% of the variance in student satisfaction. Satisfaction explained 35.9% of institutional image, while satisfaction and institutional image jointly explained 52.7% of student loyalty. All endogenous constructs had positive Q-squared values, demonstrating predictive relevance.

Table 4. Explanatory and Predictive Power

Endogenous construct	R-squared	Adjusted R-squared	Q-squared
Student satisfaction	0.479	0.469	0.393
Institutional image	0.359	0.357	0.276
Student loyalty	0.527	0.524	0.430

Source: Authors' calculations from SmartPLS output (2026).

Bootstrapping showed that every hypothesized relationship was positive and significant at $p < 0.001$. Among the service-quality dimensions, responsiveness had the largest coefficient (beta = 0.299), followed by tangibles (beta = 0.264), empathy (beta = 0.216), reliability (beta = 0.210), and assurance (beta = 0.162). The effect of satisfaction on institutional image was the strongest relationship in the model (beta = 0.599). Satisfaction (beta = 0.409) and institutional image (beta = 0.403) exerted nearly equal direct effects on loyalty.

Table 5. Direct Effects and Hypothesis Decisions (SmartPLS Bootstrapping Output, 2026)

Hypothesis / path	Beta	t	p	Decision
H1: TG -> SS	0.264	5.777	<0.001	Supported
H2: RL -> SS	0.210	4.291	<0.001	Supported
H3: RS -> SS	0.299	6.427	<0.001	Supported
H4: AS -> SS	0.162	3.877	<0.001	Supported
H5: EM -> SS	0.216	4.424	<0.001	Supported
H6: SS -> II	0.599	13.789	<0.001	Supported
H7: SS -> SL	0.409	7.411	<0.001	Supported
H8: II -> SL	0.403	7.186	<0.001	Supported

4.4. Discussion

The positive effect of tangibles supports H1 and confirms that physical and digital evidence remains central even when postgraduate learning is partly online or hybrid. Contemporary tangibles extend beyond buildings and classroom furniture to include internet access, digital library resources, learning materials, and consistent academic communication. Students interpret these resources as visible evidence of institutional investment and preparedness. The result is aligned with findings that tangible facilities and technology contribute to satisfaction in higher education (Bwachele et al., 2023; Sibai et al., 2021). Its second-largest service coefficient indicates that infrastructure and information presentation are not merely supporting conditions but substantive components of the postgraduate experience.

Reliability significantly increased satisfaction, supporting H2. Accurate records, dependable teaching, and consistent handling of academic problems reduce uncertainty and transaction costs for students. This is especially important for respondents who work or run businesses and cannot absorb repeated administrative errors or unpredictable procedures. The result is consistent with studies that identify reliability as a key determinant of satisfaction because it represents the institution's ability to fulfill its side of the exchange relationship (Bwachele et al., 2023; Mulyono et al., 2020).

Responsiveness was the strongest SERVQUAL predictor, supporting H3. The finding reflects the time sensitivity of postgraduate services. Students frequently need rapid clarification regarding schedules, registration, assessment, supervision, and graduation requirements. When lecturers and staff communicate completion times, provide prompt service, and remain available, students experience lower waiting costs and greater control over their study obligations. This result reinforces evidence from service-quality studies that responsiveness can dominate other dimensions when users value speed and accessibility (Sibai et al., 2021; Theresia and Bangun, 2017). Operationally, the institution can achieve a relatively immediate satisfaction gain by establishing response-time standards and integrated service channels.

Assurance had the smallest coefficient but remained statistically significant, supporting H4. Professionalism, trustworthy information, courteous behavior, and management support for personnel contribute to satisfaction by reducing perceived risk. The comparatively smaller coefficient may indicate that assurance is treated as a basic expectation: students presume that lecturers and administrators are competent, so additional assurance produces a smaller marginal increase than faster responses or better facilities. Nevertheless, assurance cannot be neglected because inconsistency or unprofessional behavior can quickly damage trust and institutional credibility (Hassan and Shamsudin, 2019).

Empathy positively affected satisfaction, supporting H5. The result demonstrates that students value individualized attention and recognition of diverse postgraduate circumstances. Respondents differed in program, semester, employment, and learning mode; therefore, a uniform service approach may not meet all needs. Accessible personnel, concern for students' interests, and understanding of work-study constraints signal that the university values the relationship rather than treating service as an impersonal transaction. The finding is consistent with the relational logic of Social Exchange Theory and with studies that associate personalized care with more favorable service evaluations (Elahinia and Karami, 2019).

Student satisfaction exerted a strong effect on institutional image, supporting H6. This was the largest structural coefficient and shows that image is grounded in accumulated experience. Communication can introduce an institutional promise, but students revise that promise through actual interactions with facilities, systems, lecturers, administrators, and academic procedures. When the experience is satisfying, students are more likely to judge the institution as professional, reputable, credible, and emotionally attractive. This result supports models in which satisfaction precedes image (Mesta, 2019; Romero et al., 2023) and cautions institutions against managing reputation separately from operational service quality.

Student satisfaction also directly increased loyalty, supporting H7. A satisfying exchange creates a reciprocal tendency to recommend the institution, communicate positive experiences, feel proud, and consider future programs. This finding is consistent with evidence from several higher education markets (Borishade et al., 2021; Chandra et al., 2019; Todea et al., 2022). Satisfaction therefore has both an immediate behavioral value and an indirect reputational value: it encourages loyalty while simultaneously improving the image that further supports loyalty.

Institutional image positively influenced loyalty, supporting H8. Its coefficient was almost identical to the satisfaction-loyalty coefficient, showing that loyalty is driven by two complementary mechanisms. Satisfaction represents the evaluation of personal experience, whereas image represents the broader meaning and credibility attached to the institution. Students may be satisfied with individual services yet become strongly loyal only when they also believe that the institution has a respected and professional identity. This finding accords with research that identifies image as a direct or mediating mechanism in student loyalty (Masserini et al., 2019; Mohammed et al., 2023; Seow and Hussain, 2024).

Taken together, the results provide a sequential interpretation grounded in Social Exchange Theory. Service quality represents the benefits supplied by the institution; satisfaction is the student's evaluation of those benefits; institutional image is the generalized cognitive and affective perception formed from repeated experience; and loyalty is the reciprocal response that sustains the relationship. The model also demonstrates that institutions should not rely on a single quality initiative. Responsiveness has the greatest immediate operational leverage, but facilities, reliability, assurance, and empathy jointly form the service system from which satisfaction, image, and loyalty emerge.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

This study demonstrates that the five SERVQUAL dimensions are distinct and significant drivers of postgraduate student satisfaction. Responsiveness is the most influential dimension, followed by tangibles, empathy, reliability, and assurance. Satisfaction strongly shapes institutional image and directly promotes loyalty, while institutional image independently reinforces loyalty. The near-equal effects of satisfaction and image on loyalty show that long-term student relationships depend on both a favorable personal experience and a credible institutional identity.

Theoretically, the findings support Social Exchange Theory by showing how service benefits generate positive evaluations and reciprocal relationship behavior. They also extend the SERVQUAL application by treating the five dimensions as separate predictors and by linking them to a satisfaction-image-loyalty sequence in postgraduate education. The strong satisfaction-image relationship highlights that reputation is not only an antecedent communicated to students; it is also an outcome continuously produced through service experience.

5.2. Managerial Recommendations

Postgraduate management should place responsiveness at the center of service improvement. Clear response-time standards, a single integrated information channel, service-ticket monitoring, and defined responsibility for academic and administrative requests can reduce delays and inconsistent answers. Staff availability is particularly important for students balancing work and study.

Physical and digital tangibles should be managed as one service system. Libraries, internet access, learning platforms, classrooms, academic guidelines, and digital communication must be current,

reliable, easy to access, and visually consistent with the institution's professional positioning. Reliability can be strengthened through standardized procedures, synchronized information across channels, accurate records, and transparent service timelines.

Assurance and empathy require investment in people. Personnel should receive updated procedural information, adequate authority, supporting technology, and training in professional communication. At the same time, service policies should accommodate differences in program stage, thesis progress, employment status, and learning mode. Finally, institutional image should be built through verified experience: program quality, lecturer competence, service consistency, graduate outcomes, and credible communication must reinforce one another.

To translate satisfaction into loyalty, the institution should create structured opportunities for recommendation and continued engagement, including alumni communities, professional development programs, testimonial channels, mentoring, and recognition of student and alumni achievements. These activities should not substitute for service quality; they should provide satisfied students with credible reasons and practical channels to maintain the relationship.

5.3. Limitations and Future Research

The study is limited to one postgraduate faculty and uses cross-sectional self-reported perceptions, so causal interpretation and generalization should be made cautiously. The model explains 47.9% of satisfaction, 35.9% of institutional image, and 52.7% of loyalty, leaving meaningful variance for other determinants. The analysis focuses on direct effects and does not test mediation, moderation, or differences across programs and learning modes. Future research should compare public and private universities, use longitudinal or mixed-method designs, combine perception data with objective service metrics, test the mediating roles of satisfaction and image, and conduct multi-group analysis by program, employment status, semester, and face-to-face, online, or hybrid learning experience.

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APPENDIX A. MEASUREMENT ITEMS

The following statements reproduce the complete measurement instrument used in the study in English. The questionnaire was administered to respondents in Indonesian; the wording below is a publication translation prepared to support replication and contextual adaptation.

Table A1. Complete Measurement Items and Main Sources

Code	Construct / dimension	Measurement item	Main source(s)
TG1	Tangibles	The FEB UNJ Postgraduate Program has up-to-date and adequate library resources, both printed and digital, to support students' academic needs.	Bwachele et al. (2023)
TG2	Tangibles	The FEB UNJ Postgraduate Program has physical facilities, such as classrooms, buildings, and furniture, that are safe and suitable for learning activities.	Bwachele et al. (2023)
TG3	Tangibles	The FEB UNJ Postgraduate Program provides adequate printed materials or learning-support materials to support the learning process.	Bwachele et al. (2023)
TG4	Tangibles	The FEB UNJ Postgraduate Program has an internet connection that is easy to access and supports students' learning needs.	Bwachele et al. (2023)
TG5	Tangibles	The academic information materials and learning materials provided by the FEB UNJ Postgraduate Program reflect a professional institutional image.	Bwachele et al. (2023)
RL1	Reliability	Lecturers in the FEB UNJ Postgraduate Program have strong teaching ability and academic competence.	Bwachele et al. (2023)
RL2	Reliability	Lecturers in the FEB UNJ Postgraduate Program demonstrate commitment to helping students resolve academic problems.	Bwachele et al. (2023)
RL3	Reliability	The FEB UNJ Postgraduate Program maintains students' academic and administrative records in a detailed, accurate, and organized manner.	Bwachele et al. (2023)
RS1	Responsiveness	The FEB UNJ Postgraduate Program provides clear information about when academic and administrative services will be provided or completed.	Bwachele et al. (2023)
RS2	Responsiveness	Administrative staff in the FEB UNJ Postgraduate Program provide academic and administrative services to students promptly.	Bwachele et al. (2023)
RS3	Responsiveness	Lecturers in the FEB UNJ Postgraduate Program are willing to help students when they encounter academic difficulties.	Bwachele et al. (2023)
RS4	Responsiveness	Administrative staff in the FEB UNJ Postgraduate Program make time to respond promptly to students' needs.	Bwachele et al. (2023)
AS1	Assurance	I trust the lecturers and administrative staff of the FEB UNJ Postgraduate Program when they provide academic and administrative services.	Bwachele et al. (2023)
AS2	Assurance	Lecturers and administrative staff in the FEB UNJ Postgraduate Program inspire my confidence in the information and services they provide.	Bwachele et al. (2023)
AS3	Assurance	Lecturers and administrative staff in the FEB UNJ Postgraduate Program are courteous and considerate when providing services to students.	Bwachele et al. (2023)
AS4	Assurance	The management of the FEB UNJ Postgraduate Program provides adequate support to lecturers and administrative staff to improve service quality.	Bwachele et al. (2023)
EM1	Empathy	Administrative staff in the FEB UNJ Postgraduate Program give me individual attention when I need academic or administrative services.	Bwachele et al. (2023)
EM2	Empathy	Lecturers in the FEB UNJ Postgraduate Program give me individual attention when I need academic assistance.	Bwachele et al. (2023)
EM3	Empathy	Lecturers and administrative staff in the FEB UNJ Postgraduate Program understand my needs as a postgraduate student.	Bwachele et al. (2023)
EM4	Empathy	Lecturers and administrative staff in the FEB UNJ Postgraduate Program consider students' best interests when providing services.	Bwachele et al. (2023)
EM5	Empathy	Lecturers and administrative staff in the FEB UNJ Postgraduate Program are easy to contact when I need services or assistance.	Bwachele et al. (2023)

Table A1. Complete Measurement Items and Main Sources (Continued)

Code	Construct / dimension	Measurement item	Main source(s)
SS1	Student satisfaction	I am satisfied with the overall educational services provided by the FEB UNJ Postgraduate Program.	Hossain et al. (2025); Ali et al. (2016)
SS2	Student satisfaction	I am pleased that I chose the FEB UNJ Postgraduate Program as the place to pursue my studies.	Hossain et al. (2025); Ali et al. (2016)
SS3	Student satisfaction	My experience as a student in the FEB UNJ Postgraduate Program has been enjoyable.	Hossain et al. (2025); Ali et al. (2016)
SS4	Student satisfaction	Choosing the FEB UNJ Postgraduate Program was a wise decision for me.	Hossain et al. (2025); Ali et al. (2016)
SS5	Student satisfaction	The academic environment of the FEB UNJ Postgraduate Program is appropriate and supportive for my studies.	Hossain et al. (2025); Ali et al. (2016)
II1	Institutional image (cognitive)	In my assessment, the FEB UNJ Postgraduate Program is viewed positively by students and the public.	Hossain et al. (2025); Palacio et al. (2002)
II2	Institutional image (cognitive)	The FEB UNJ Postgraduate Program has a strong reputation and presence at the national and international levels.	Hossain et al. (2025); Palacio et al. (2002)
II3	Institutional image (cognitive)	The FEB UNJ Postgraduate Program presents a professional image to the public.	Hossain et al. (2025); Palacio et al. (2002)
II4	Institutional image (cognitive)	The educational programs of the FEB UNJ Postgraduate Program are known to have a good reputation.	Hossain et al. (2025); Palacio et al. (2002)
II5	Institutional image (cognitive)	Graduates of the FEB UNJ Postgraduate Program have strong competitiveness and good career development prospects.	Hossain et al. (2025); Palacio et al. (2002)
II6	Institutional image (cognitive)	The FEB UNJ Postgraduate Program has reputable lecturers and researchers.	Hossain et al. (2025); Palacio et al. (2002)
II7	Institutional image (affective)	The FEB UNJ Postgraduate Program evokes pleasant feelings in me.	Palacio et al. (2002)
II8	Institutional image (affective)	The FEB UNJ Postgraduate Program gives me the impression of being an attractive institution.	Palacio et al. (2002)
II9	Institutional image (affective)	I feel comfortable being part of the FEB UNJ Postgraduate Program.	Palacio et al. (2002)
II10	Institutional image (affective)	The FEB UNJ Postgraduate Program gives the impression of being a lively and dynamic institution.	Palacio et al. (2002)
SL1	Student loyalty (attitudinal)	I feel proud of and have a sense of belonging to FEB UNJ.	Ngo et al. (2025)
SL2	Student loyalty (attitudinal)	I am committed to protecting the reputation and resources of FEB UNJ.	Ngo et al. (2025)
SL3	Student loyalty (attitudinal)	I tend to communicate positive information about FEB UNJ to my family, friends, and colleagues.	Ngo et al. (2025)
SL4	Student loyalty (behavioral)	I would prefer FEB UNJ if I were to pursue further study or an advanced competency development program.	Ngo et al. (2025)
SL5	Student loyalty (behavioral)	I am willing to recommend the FEB UNJ Postgraduate Program to my family, friends, or colleagues.	Ngo et al. (2025)
SL6	Student loyalty (behavioral)	I am willing to continue sharing my study experience at the FEB UNJ Postgraduate Program with others.	Ngo et al. (2025)

Note: All items were measured using a six-point Likert scale ranging from 1 = strongly disagree to 6 = strongly agree. Researchers adapting these items should cite this article together with the original source or sources shown in the final column.