Image and Quality from the Student Perspective: An Empirical Model in Portuguese Higher Education Solution

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Abstract: Higher education institutions (HEIs) face numerous uncontrollable environmental factors that increasingly demand consistency between institutional discourse and actual practice. This coherence requires managers to redefine the role of organizational image, aligning it closely with real institutional practices rather than building a superficial facade to satisfy short-term demand. This paper develops and validates a structural model to examine the relationship between corporate image and perceived quality in higher education institutions from the student perspective in Portugal. Methodologically, Principal Component Analysis (PCA) and path analysis within a structural equation modeling (SEM) framework were conducted on a representative sample of 869 students across 11 diverse public and private Portuguese universities. The empirical results reveal that image behaves as a complex, multi-dimensional construct. While the alignment with faculty specialization features is positively associated with satisfaction, a stronger emphasis on physical infrastructure and services is negatively associated with functional student satisfaction. The structural paths highlight the intricate interplay between image, satisfaction, perceived quality, and loyalty, offering critical strategic insights for university administrators.

Key words: Institutional Image, Perceived Quality, Higher Education, Student Satisfaction, Student Loyalty, Portugal.

INTRODUCTION

Higher education institutions are facing unprecedented structural, societal, and economic shifts. As highlighted by Cortés and Onsalo (2007), contemporary challenges include the homogenization of educational services, market saturation of academic offerings, accelerating student consumption patterns, communication clutter, and changing audience expectations and behaviours. In addition to these pressures, competition is intensified by the implementation of the Bologna Convention and the subsequent harmonization of academic degrees across the European Union.

This structural alignment facilitates cross-border mobility and employability for students, professors, and researchers alike. Consequently, less competitive universities risk losing significant portions of their student body and intellectual capital to international or better-positioned peers (Alves & Raposo, 2010).

The corporate image of an educational institution develops from the systematic manifestation of its distinct dimensions (such as the quality of the educational service) and its qualification through specific experiential attributes. The collective degree of knowledge and perception held by stakeholders fundamentally dictates an institution's long-term reputation within the highly competitive educational marketplace. Therefore, university administrators and strategic managers must recognize that evaluating and managing institutional image is an indispensable component of modern strategic planning.

The relationship between external environmental changes and shifting internal and external stakeholder perceptions has been established in the literature (Albert & Whetten, 1985; Gioia & Thomas, 1996; Baker & Balmer, 1997; Kazoleas et al., 2001; Melewar & Akel, 2005). Simultaneously, the heightened emphasis on quality, operating efficiency, productivity, and cross-institutional competitiveness observed in universities represents a response to macroeconomic forces. In Portugal, this evolution reflects a long-term process of massification in higher education: student enrolment increased from 81,582 in 1978 to 456,032 in 2025 (PORDATA, n.d.).

LITERATURE REVIEW

According to Kotler and Fox (1999), an organizational image is defined as the general impression that an individual or public holds regarding an object or institution. This image is frequently built upon fragmented or incomplete information and naturally varies across distinct target audiences. From the seminal perspective of Kennedy (1977), image is composed of two primary dimensions: a functional component, which relates to tangible, easily measured stimuli, and an emotional component, which is associated with deeper psychological conditions manifested through feelings and enduring attitudes.

Similarly, Mazursky and Jacoby (1986) explain how consumers form images of retail stores from multiple attributes and experiences. In the university context, these ideas help distinguish functional evaluations from affective responses.

Organizational image is never uniform; it depends tightly on the specific stakeholder group perceiving it. Hence, it is essential for managers to segment relevant stakeholders (e.g., current students, prospective

students, alumni, employers, faculty) and evaluate the image distinctively within each group (Cortés & Onsalo, 2007). General audiences perceive academic institutions through an array of multi-attribute dimensions including academic reputation, campus appearance, cost structures, personalized attention, geographical location, distance, and the professional readiness of graduates (Huddleston & Karr, 1982). These perceptions are combined with internal psychological factors unique to each individual, such as prior learning, baseline expectations, motivations, and socio-economic background (Schiffman & Kanuk, 1983).

Interest in service quality grew substantially in the 1980s, establishing two major research paradigms in marketing literature (Brogowicz, Delene, & Ly, 1990; Brady & Cronin, 2001). The Nordic school, pioneered by Grönroos (1982, 1984) and informed by service-marketing research such as Gummesson (1978), models service quality around corporate image and the interaction between technical quality (what is delivered) and functional quality (how it is delivered). Conversely, the North American school, led by Parasuraman, Zeithaml, and Berry (1985, 1988), centres on the gap model, analysing service deficiencies by comparing customer expectations with perceptions through the SERVQUAL scale.

In higher education, the conceptualization of Total Quality Management (TQM) has faced significant debate. Sahney, Banwet, and Karunes (2004) define educational TQM as a multifaceted system integrating managerial, technical, and social subsystems. Houston (2007) cautions against the superficial transfer of commercial TQM paradigms to higher education, arguing that treating students purely as traditional commercial customers can distort the distinct educational mission of universities. Academic quality should instead prioritize learning and improvement in context.

In the context of higher education, university image plays an important role in shaping students' expectations and evaluations of their institutional experience. Previous research has highlighted the relevance of university image in influencing student perceptions and behaviour (Alves & Raposo, 2010; Cortés & Onsalo, 2007). Furthermore, service quality literature recognizes the relationship between corporate image and the overall evaluation of service quality (Grönroos, 1984; Brady & Cronin, 2001). These contributions provide a theoretical basis for examining the relationships between university image, student satisfaction, and perceived educational quality.

Student satisfaction is also relevant to the development of student loyalty, as positive institutional experiences may strengthen students' willingness to maintain their relationship with the university and

recommend it to others (Alves & Raposo, 2010). Moreover, students' perceptions of educational quality may be associated with their accumulated experiences and overall evaluations of the institution. From this perspective, satisfaction and loyalty are examined as complementary dimensions of the student experience that may be associated with perceived quality. Although conventional service-quality models generally position perceived quality as an antecedent of satisfaction and loyalty, the present study adopts a complementary perspective by examining these relationships in the opposite direction within the specific context of higher education.

Research Model and Hypotheses

To empirically test these theoretical relationships, a conceptual structural model was formulated. The model evaluates the directional links between University Image, Student Satisfaction, Student Loyalty, and Perceived Quality. Based on the literature review, five hypotheses were established for empirical validation. Figure 1 presents the proposed conceptual model.

Hypothesis 1a: The corporate image of the University is positively related to student satisfaction with their institution

Hypothesis 1b: The image that the University projects in society is positively related to the students' perception of the educational quality practiced

Hypothesis 2a: Student satisfaction is positively related to student loyalty

Hypothesis 2b: Student satisfaction is positively related to perceived quality

Hypothesis 2c: Student loyalty is positively related to perceived quality

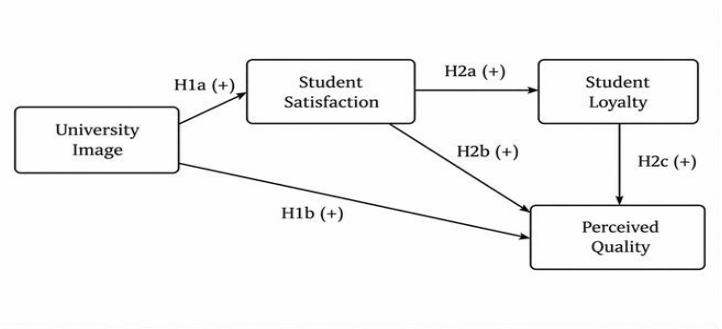


Figure 1. Conceptual research model

Note: Positive directions (+) reproduce the hypotheses; empirical paths and signs should be reported separately.

Source: Author’s own elaboration.

METHODOLOGY

The primary objective of this empirical study is to provide evidence regarding the attributes associated with the relationships between institutional image and perceived educational quality, as well as the factors influencing the structural pathways among the constructs. The research design integrates an exploratory qualitative phase followed by a descriptive quantitative phase.

A questionnaire was developed based on the relevant literature and structured into four sections. Section A collected students' sociodemographic information, including age, gender, institution, degree programme, year of study, and employment status. Section B measured students' expectations and general attitudes using semantic differential scales.

Section C assessed institutional image through a set of attributes measured on a seven-point Likert scale (1 = totally disagree; 7 = totally agree). The conceptual framework initially described 23 foundational image attributes distributed across five domains: Personal/Social Prestige, Interpersonal Transactions, Labour Market Insertion, Academic Level, and Physical Environment. The operational measurement scale submitted to statistical analysis comprised 25 items, including two supplementary indicators incorporated to provide a broader assessment of institutional image.

Section D assessed student satisfaction through an initial set of 31 items. The conceptual description covered the same 23 foundational attributes considered in the institutional image assessment, together with five additional integrative indicators addressing tuition fees, the relationship between institutional image and teaching-related aspects, and institutional selection drivers. Three supplementary indicators were incorporated into the operational satisfaction scale to capture students' overall evaluation of their educational experience. This structure enabled satisfaction to be assessed in relation to both institutional characteristics and students' broader academic experience.

A pilot implementation was administered to a stratified random sample of 200 students across 11 higher education institutions through the Universia platform. The preliminary psychometric assessment provided evidence of the reliability and construct structure of the measurement instrument. For the institutional image and student satisfaction measures, the exploratory factor analysis identified seven factors with eigenvalues greater than one, explaining 43% of the total variance. Factor loadings exceeded 0.30. Cronbach's alpha reached .941 for the Image Attributes scale and .950 for the Student Satisfaction scale, indicating high internal consistency. The individual subscales achieved internal consistency coefficients ranging from .634 to .825, while the overall scale discriminatory power was Z = .785, significant at the 99.9% confidence level.

Measurement Scales and Factor Structure

The measurement instrument comprised four constructs: institutional image, student satisfaction, student loyalty, and perceived educational quality. For institutional image and student satisfaction, the initial item sets submitted to principal component analysis (PCA) comprised 25 and 31 items, respectively. These figures represent the complete operational measurement sets used in the empirical analysis, whereas the 23 and 28 indicators reported in the initial questionnaire description refer to the conceptual organisation of the respective constructs.

More specifically, the institutional image scale included the 23 foundational attributes described in Section C and two supplementary indicators. The student satisfaction scale comprised the same 23 foundational attributes, five additional integrative indicators, and three supplementary indicators addressing students' overall educational experience. This distinction accounts for the difference between the conceptual descriptions and the item counts used in the PCA.

The PCA was conducted using Varimax rotation, and items with communalities below .40 were excluded from the final factor solutions. Institutional image yielded two dimensions: Infrastructure and Services (Image1) and Faculty Characteristics (Image2). Student satisfaction also yielded two dimensions: Functional Quality and Fees (Satisfaction1), and Reputation and Academic Exchange (Satisfaction2).

Student loyalty was operationalised as an attitudinal construct reflecting students' commitment and intention to maintain their relationship with the institution. The PCA identified one attitudinal dimension (Loyalty1). Perceived educational quality was represented by two dimensions: Facilities and Services (Quality1), and Academic Faculty Qualifications (Quality2). One item (d1_q) was excluded from the latter scale due to its low internal consistency.

The internal consistency of the resulting dimensions was assessed using Cronbach's alpha. The coefficients were .949 for Infrastructure and Services and .750 for Faculty Characteristics; .903 for Functional Quality and Fees and .796 for Reputation and Academic Exchange; .726 for Attitudinal Loyalty; and .853 for Facilities and Services and .737 for Academic Faculty Qualifications. These results indicate satisfactory to high internal consistency across the measurement dimensions.

The resulting factor structure provided the basis for the subsequent analysis of the relationships among institutional image, student satisfaction, student loyalty, and perceived educational quality.

Sample Characteristics

The final validated sample comprised 869 active students from 11 public and private Portuguese higher education institutions. The demographic breakdown included 464 female students (54%) and 405 male students (46%). Participants' ages ranged from 17 to 52 years, with a mean

age of 22.38 years (standard deviation = 3.39). More than 60% were between 17 and 22 years old, while only 2% were over 30.

Regarding employment status, 233 participants were working students (27%), while the remaining 73% were full-time students. The participants represented 34 degree programmes across technical, scientific, artistic, humanistic, and social sciences fields.

Table 1. Profile of Participating Higher Education Institutions

Institution	Frequency	Percentage (%)
Technical University of Lisbon	201	23.1
University of Lisbon	127	14.6
University of Coimbra	110	12.7
University of Porto	103	11.9
Other institutions (NOVA, ISCTE, Évora, Algarve, UCP, etc.)	328	37.7
Total	869	100.0

Source: Author's own elaboration.

STATISTICAL ANALYSIS AND STRUCTURAL RESULTS

The statistical analysis followed a two-stage approach. First, Principal Component Analysis (PCA) with Varimax rotation was conducted using SPSS v.27 to examine the dimensional structure of the scales. Items with communalities below 0.40 were removed. Second, path analysis within a structural equation modelling framework was performed using AMOS v.17 and maximum likelihood estimation to evaluate structural relationships. The procedures followed established guidance on structural equation modelling (Maroco, 2010).

Factorial Structure of Image and Satisfaction Scales

The initial 25-item Image scale was reduced to two clear dimensions via PCA: Component 1 (Image1 - Infrastructure and Services, alpha = 0.949) and Component 2 (Image2 - Faculty Characteristics, alpha = 0.750), explaining a substantial portion of total variance.

Table 2 outlines the extracted factor matrix for the Image scale items showing high component loadings.

Table 2. Principal Components Extracted from the Image Scale

Item Code	Description	Component 1	Component 2
c17_q	Speed and efficiency of administrative services	0.836	0.120
c28_q	Modern infrastructure and facilities	0.831	0.145
c14_q	Modern laboratory environments	0.803	0.201
c26_q	Social support systems for students	0.797	0.115

c6_q	Library infrastructure and access	0.769	0.220

Source: Author's own elaboration

The initial 31-item Satisfaction scale was reduced to two dimensions: Component 1 (Satisfaction1 - Functional Quality and Fees, alpha = 0.903) and Component 2 (Satisfaction2 - Reputation and Academic Exchange, alpha = 0.796). Similarly, the Loyalty scale isolated an attitudinal dimension (Loyalty1, alpha = 0.726). The Quality scale yielded two dimensions: Component 1 (Quality1 - Facilities and Services, alpha = 0.853) and Component 2 (Quality2 - Academic Faculty Qualifications, alpha = 0.737 after removing item d1_q due to low consistency).

Structural Model Fit Validation

The global fit of the structural model was evaluated using standard absolute and comparative fit indices, including the Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), Normed Fit Index (NFI), Root Mean Square Residual (RMR), and Root Mean Square Error of Approximation (RMSEA). Multicollinearity was controlled using Variance Inflation Factors (VIF), with all values below the critical threshold of 5. Outliers were checked via Mahalanobis squared distance (D^2), showing no distorting effects on the parameters.

Table 3 confirms that the structural model achieves an outstanding fit to the real data matrix.

Table 3. Structural Model Global Fit Indices

Fit Statistic	Observed Model Value	Standard Recommended Threshold
Chi-Square (χ^2)	8.998 (df=3, p=.029)	p > .01
Normed Chi-Square (χ^2/df)	2.999	< 3.00
Comparative Fit Index (CFI)	0.997	> 0.90
Goodness-of-Fit Index (GFI)	0.997	> 0.90
Normed Fit Index (NFI)	0.995	> 0.90
RMSEA	0.048	< 0.08

Source: Author's own elaboration

Hypotheses Testing and Path Coefficients

The structural coefficients and statistical significance of each path were evaluated using critical ratios (CRs) and p-values. The relationship between corporate image and student satisfaction differed by dimension: Image1 had a significant negative association with Satisfaction1, whereas Image2 had a significant positive association.

Table 4 summarizes the standardized structural regression weights for the final path model.

Table 4. Standardized Regression Weights and Path Significance

Structural Path	Estimate (β)	Standard Error (SE)	Critical Ratio (CR)	p-value
Satisfaction1 <--- Image2	0.165	0.033	4.967	< .001***
Satisfaction1 <--- Image1	-0.134	0.033	-4.046	< .001***
Quality2 <--- Image2	0.111	0.015	7.430	< .001***
Quality2 <--- Image1	0.034	0.015	2.278	.023*
Quality1 <--- Image2	0.273	0.030	9.102	< .001***
Quality1 <--- Image1	0.310	0.030	10.405	< .001***
Loyalty1 <--- Satisfaction1	-0.372	0.032	-11.794	< .001***
Quality2 <--- Satisfaction1	-0.189	0.032	-5.825	< .001***
Quality1 <--- Satisfaction1	0.881	0.026	33.884	< .001***
Quality2 <--- Loyalty1	-0.244	0.047	-5.191	< .001***

Source: Author's own elaboration

DISCUSSION OF FINDINGS

The empirical findings provide several relevant insights into the relationships between institutional image, student satisfaction, perceived quality, and attitudinal loyalty in higher education. Overall, the results suggest that these constructs should not be considered interchangeable or assumed to operate uniformly across all their dimensions. Instead, the estimated relationships indicate that different aspects of institutional image and students' experiences may be associated with distinct evaluations of the institution. This distinction is particularly relevant for university managers seeking to strengthen institutional reputation while maintaining consistency between the image communicated to prospective students and the experience delivered to current students.

First, the results reveal different relationships between the two dimensions of institutional image and functional satisfaction. Image1 (Infrastructure and Services) presents a negative and statistically significant association with Satisfaction1 ($\beta = -0.134$, $p < 0.001$), whereas Image2, associated with faculty characteristics, presents a positive and statistically significant association with satisfaction ($\beta = 0.165$, $p < 0.001$). These contrasting coefficients suggest that institutional image is not a uniform construct in its relationship with student satisfaction. In particular, the positive relationship involving faculty characteristics is consistent with the importance of academic staff in shaping students' overall experience of higher education. Students' perceptions of faculty-related attributes may contribute to their evaluation of the institution because these attributes are closely connected to the educational experience.

The negative coefficient for Image1 requires a more cautious interpretation. It does not necessarily mean that better infrastructure or services reduce satisfaction. Rather, it indicates that, within the estimated model, a higher score on this image dimension is associated with a lower score on functional satisfaction, conditional on the other variables included in the analysis. One possible explanation is that students who place greater emphasis on infrastructure and services may also develop higher expectations regarding the institution's operational performance. If their experience does not fully meet those expectations, their evaluations may be less favourable. However, this explanation remains a hypothesis and cannot be established from the coefficient alone. Other possibilities, including the way the constructs are measured and the relationships among the model variables, would require further examination.

From a managerial perspective, this finding cautions against assuming that investments in visible facilities or the promotion of administrative services will automatically improve student satisfaction. Physical resources and service provision remain relevant aspects of the university experience, but their perceived value depends on how effectively they support students' academic and administrative needs. Institutions should therefore evaluate not only the availability of facilities and services but also their accessibility, reliability, responsiveness, and practical contribution to students' everyday activities. At the same time, the positive relationship between Image2 and satisfaction highlights the importance of understanding how students perceive faculty-related characteristics when developing institutional positioning and quality improvement strategies.

Second, both dimensions of institutional image are positively associated with the two dimensions of perceived quality. The estimated paths from Image1 to Quality1 and Quality2 are β = 0.310 and β = 0.034, respectively, while the paths from Image2 to Quality1 and Quality2 are β = 0.273 and β = 0.111. According to the reported results, all four relationships are positive and statistically significant, although their magnitudes differ considerably. The strongest of these associations concerns the relationship between Image1 and Quality1, followed by the relationship between Image2 and Quality1. By comparison, the estimated associations with Quality2 are smaller.

This pattern suggests that students' perceptions of institutional image are positively associated with their assessments of quality, but that the strength of these relationships depends on the specific dimensions being considered. The relatively small coefficient between Image1 and Quality2, for example, indicates a more limited association than the corresponding relationship with Quality1. Similarly, the positive coefficient involving Image2 and Quality2 is smaller than its relationship with Quality1. These differences reinforce the value of examining institutional image and perceived quality through their constituent dimensions rather than relying exclusively on aggregated scores.

For university administrators, the findings indicate that institutional image management should be connected to the actual characteristics of

the educational experience. Communication about infrastructure, services, and faculty should be credible and supported by institutional practices that students can experience directly. Although a favourable image is associated with higher perceived quality in the estimated model, the coefficients do not establish that image management alone produces improvements in educational quality. Rather, they support the view that image and perceived quality are related dimensions that should be monitored together when evaluating institutional performance.

Third, the relationship between Satisfaction1 and Quality1 is particularly noteworthy. With a coefficient of $\beta = 0.881$ ($p < 0.001$), this is the largest estimated path reported in the model. The magnitude of this positive association indicates that functional satisfaction is closely related to students' evaluations of infrastructure and services quality. This result is consistent with the idea that students' assessments of quality are informed by their accumulated experiences of the institution's everyday functioning, including their interactions with facilities, administrative processes, and the services that support their studies.

The strength of this relationship highlights the importance of distinguishing between isolated service encounters and students' broader assessments of institutional quality. A university may possess substantial resources, but students' evaluations may also depend on whether those resources are accessible, well maintained, and effectively integrated into their academic experience. Functional satisfaction can therefore provide useful information about how students experience the operational aspects of the institution. Monitoring this dimension may help university managers identify service-related weaknesses and prioritise improvements that are relevant to students.

Nevertheless, the coefficient should be interpreted as a strong estimated association rather than evidence that satisfaction directly causes perceived quality. Its magnitude also makes it important to consider whether the two constructs are empirically distinct and whether their measurement items capture overlapping aspects of the student experience. Further assessment of construct validity and the model specification would help clarify the extent to which the relationship reflects a distinct association between satisfaction and perceived quality. This qualification does not diminish the importance of the result; it identifies a relevant point for interpreting the model and guiding subsequent research.

A further finding concerns the relationship between Satisfaction1 and Quality2, which is negative ($\beta = -0.189$). This contrasts with the strong positive relationship between Satisfaction1 and Quality1. The results therefore do not support the assumption that functional satisfaction is uniformly associated with all dimensions of perceived quality. One possible interpretation is that students distinguish between satisfaction with the institution's infrastructure and services and their assessment of the academic or faculty-related dimension represented by Quality2. However, the coefficient alone does not establish why these dimensions are associated in opposite directions. The result should consequently be

treated as an empirical pattern requiring further investigation rather than as evidence that greater satisfaction necessarily compromises academic quality.

Fourth, the relationship between Satisfaction1 and Loyalty1 is negative (β = −0.372), contrary to the hypothesised positive direction. This finding is important because it challenges the expectation that more favourable functional satisfaction will necessarily correspond to stronger attitudinal loyalty in the estimated model. Although satisfaction and loyalty are often considered related aspects of the student–institution relationship, the present result indicates that their relationship may be more complex in this particular empirical context.

Several explanations could be explored in future research, including differences between satisfaction with specific institutional services and broader emotional or attitudinal attachment to the institution. Students may evaluate administrative and infrastructural experiences separately from their overall identification with the university. Nevertheless, these are possible interpretations rather than explanations demonstrated by the current analysis. The negative estimate may also be influenced by the model specification, the operationalisation of the constructs, or the relationships among the included variables. Accordingly, the result should not be interpreted as establishing that satisfaction reduces loyalty. Instead, it indicates that the hypothesised positive relationship was not supported by the estimated coefficient and warrants further examination.

The relationship between Loyalty1 and Quality2 is also negative and statistically significant (β = −0.244, $p < 0.001$). This result suggests that higher attitudinal loyalty is associated with lower evaluations of the quality dimension represented by Quality2 in the estimated model. The finding is counterintuitive if loyalty is assumed to reflect a uniformly favourable evaluation of every institutional attribute. However, loyalty and perceived quality may capture different aspects of students' relationship with a university, and their relationship may vary across quality dimensions. The present results do not identify the underlying mechanism, and it would therefore be inappropriate to conclude that loyal students necessarily perceive faculty-related quality less favourably in general. Further analysis would be needed to determine whether the association is robust across different student groups, institutional settings, and measurement specifications.

From a managerial standpoint, these negative relationships underline the importance of avoiding overly simplified assumptions about student satisfaction, loyalty, and perceived quality. Universities should not rely on a single indicator to evaluate the student experience. Satisfaction with operational services, perceptions of academic quality, and attitudinal loyalty should be examined separately, while also considering how they relate to one another. Where unexpected relationships emerge, institutions may benefit from more detailed student feedback and additional analyses to understand which experiences or perceptions are associated with the observed patterns.

Taken together, the findings support a multidimensional approach to higher education branding and institutional performance. The results indicate that the two dimensions of institutional image are positively associated with perceived quality, but they relate differently to functional satisfaction. In addition, the strong positive association between Satisfaction1 and Quality1 contrasts with the negative estimated relationships involving Satisfaction1 and Quality2, Satisfaction1 and Loyalty1, and Loyalty1 and Quality2. These contrasting patterns suggest that the relationships among institutional image, satisfaction, quality, and loyalty are not necessarily uniform across dimensions.

The managerial implication is that universities should integrate institutional image management with the continuous assessment of students' actual experiences. A credible institutional image should reflect the institution's educational and operational realities rather than depend solely on promotional communication. Regularly monitoring student perceptions across different dimensions can help institutions identify areas of strength, recognise possible gaps between expectations and experiences, and develop more targeted improvement initiatives. At the same time, unexpected or negative associations should prompt further investigation rather than immediate managerial conclusions.

Table 5 summarises the hypotheses, the corresponding estimated paths, the empirical outcomes, and their implications for university management. The table distinguishes between hypotheses supported in the expected direction, those only partially supported, and those for which the estimated relationship does not support the hypothesised direction.

Table 5. Summary of Hypothesis Testing and Strategic Implications

Hypothesis	Extracted path(s)	Empirical outcome	Managerial and strategic implication
H1a: Image → Satisfaction	Image1 → Satisfaction1: $\beta = -0.134$; Image2 → Satisfaction1: $\beta = +0.165$	Partially supported: the estimated relationships have opposite signs. Both coefficients are statistically significant ($p < 0.001$).	Treat institutional image as a multidimensional construct. Assess infrastructure and services separately from faculty-related perceptions when examining satisfaction.
H1b: Social Image → Quality	Image1 → Quality1: $\beta = +0.310$; Image1 → Quality2: $\beta = +0.034$; Image2 → Quality1: $\beta = +0.273$; Image2 → Quality2: $\beta = +0.111$	Supported in direction: all four estimated paths are positive and statistically significant.	Both image dimensions are positively associated with perceived quality, although the strength of the associations differs across quality dimensions.
H2a: Satisfaction → Loyalty	Satisfaction1 → Loyalty1: $\beta = -0.372$	Not supported in the hypothesised direction: the estimated association is negative.	Investigate the relationship between functional satisfaction and attitudinal loyalty before assuming that improvements in one will correspond to improvements in the other.

H2b: Satisfaction → Quality	Satisfaction1 → Quality1: β = +0.881; Satisfaction1 → Quality2: β = −0.189	Partially supported: the estimated paths have opposite signs. The path to Quality1 is statistically significant ($p < 0.001$).	Examine the dimensions of perceived quality separately and investigate the contrasting relationships with functional satisfaction.
H2c: Loyalty → Quality	Loyalty1 → Quality2: β = −0.244	Not supported in the hypothesised direction: the estimated association is negative and statistically significant ($p < 0.001$).	Avoid assuming that attitudinal loyalty corresponds to uniformly positive evaluations across all dimensions of perceived quality. Investigate the association further.

Note: ß denotes the estimated path coefficient. Statistical significance is reported where provided in the study results. "Supported in direction" refers to the sign and reported significance of the estimated paths; it should not be interpreted as independent confirmation of causal relationships.

Source: Author's own elaboration

In summary, the findings offer a more differentiated understanding of how institutional image relates to satisfaction and perceived quality, while also revealing unexpected relationships involving loyalty. The results reinforce the importance of evaluating students' perceptions across distinct dimensions and of interpreting the estimated relationships in the context of the proposed model. For university administrators, the main lesson is that effective institutional branding requires more than a favourable external image: it requires a consistent student experience, credible communication, and continuous attention to the different dimensions through which students evaluate their institution.

CONCLUSIONS AND RESEARCH LIMITATIONS

Higher education institutions cannot be managed as conventional product-oriented businesses. Although universities operate in increasingly competitive environments, their reputation depends not only on how they communicate their identity and values, but also on the extent to which these are reflected in the educational experience they deliver. Managing institutional image therefore requires consistency between institutional discourse, academic practices, service quality, and students' actual experiences. When an institution promotes an exaggerated or unverified corporate image to respond to short-term market pressures, the discrepancy between expectations and reality may undermine student satisfaction, weaken institutional credibility, and threaten long-term sustainability.

From a managerial perspective, the proposed empirical model provides a framework for examining institutional image and perceived quality from the student's perspective. By considering both cognitive and affective attributes, the model highlights the importance of understanding not only students' evaluations of institutional characteristics and service

performance, but also their overall perceptions and feelings towards the institution. This perspective can support university administrators in identifying potential gaps between the image the institution seeks to project and the image perceived by its students. Such information may inform institutional positioning, communication strategies, quality improvement initiatives, and the development of a more coherent student experience.

The practical value of this approach lies in its potential to support evidence-based decision-making. Rather than relying exclusively on promotional activities or external indicators of reputation, university managers can use student perceptions as a source of diagnostic information to identify areas requiring attention. Institutional image should consequently be treated not merely as a communication outcome, but as a strategic asset that needs to be developed and maintained through consistent institutional practices. In this respect, efforts to strengthen image should be accompanied by improvements in the underlying educational and service experience, ensuring that institutional promises remain credible and aligned with operational reality.

THEORETICAL AND CRITICAL IMPLICATIONS

Beyond its managerial implications, this study invites a broader reflection on the relationship between institutional representation and everyday educational experience. In higher education, institutional image is not simply a matter of communication or competitive positioning; it is also connected to how universities establish credibility and justify the value they claim to offer. The findings suggest that the relationship between institutional image and students' evaluations cannot be understood independently of the practices and experiences through which institutional promises acquire meaning. In this respect, discrepancies between projected image and experienced reality raise questions about institutional credibility and the conditions under which students recognize an institution's claims as legitimate.

The Portuguese case provides an empirical point of departure for considering these questions within a higher education system shaped by the expansion and diversification of institutional provision. Rather than treating student perceptions solely as indicators of managerial performance, the study highlights their potential to reveal tensions between institutional discourse and educational practice. This perspective does not imply that the empirical model directly measures broader political or social processes. Instead, it identifies a conceptual connection between the study of institutional image and wider debates about the meaning of quality, the expectations placed on higher education institutions, and the relationship between organizational claims and lived experience. The critical significance of institutional image therefore lies not only in its capacity to influence satisfaction and loyalty, but also in the need to examine how institutional credibility is sustained through the educational experience itself.

Despite its contributions, this study has limitations that should be considered when interpreting its findings. First, its cross-sectional design captures students' perceptions at a single point in time. Consequently, it does not allow changes in institutional image or perceived quality to be examined over time, nor does it establish how these perceptions may respond to changes in institutional practices or students' experiences. A longitudinal research design could address this limitation by following students across different stages of their academic journey and examining how their evaluations develop.

Second, the study focuses on the student perspective. Although students are central stakeholders in higher education, institutional image may also be perceived differently by other groups, including academic and administrative staff, prospective students, alumni, employers, and the wider community. Future research could compare these stakeholder perspectives to determine where institutional image is shared and where perceptions diverge. Such comparisons could provide a broader understanding of institutional identity and reputation and help universities identify inconsistencies between internal and external perceptions.

Further research could also examine the proposed model in different institutional contexts, including public and private institutions, different academic disciplines, and higher education systems beyond Portugal. Comparisons across institutions and contexts would help assess the model's applicability and identify whether the relationships between institutional image and perceived quality vary according to institutional characteristics or student profiles. Where appropriate, future studies could also combine quantitative analysis with qualitative methods, such as interviews or focus groups, to gain a more detailed understanding of the experiences and interpretations underlying students' evaluations.

In conclusion, this study offers an empirical framework for examining institutional image and perceived quality in Portuguese higher education from the student's perspective. Its central managerial implication is that a credible institutional image must be grounded in the quality of the experience delivered. Beyond this managerial contribution, the study draws attention to the relationship between institutional representation and educational practice, suggesting that institutional credibility depends on more than the communication of values and promises. It also depends on how these are experienced and evaluated by students. By monitoring student perceptions, addressing gaps between institutional promises and actual practices, and integrating image management with continuous quality improvement, universities can strengthen institutional credibility and support their long-term sustainability. The proposed model can serve as a diagnostic resource for university administrators, while further research is needed to examine its applicability across time, stakeholder groups, and institutional settings.

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APPENDIX A - MEASUREMENT CONSTRUCTS AND FACTOR STRUCTURE

This appendix summarises the measurement constructs, their conceptual domains, the factor structure obtained through principal component analysis (PCA), and the internal consistency of the resulting dimensions.

Table A1. Measurement Constructs and Factor Structure

Construct	Initial number of items	Factor dimension	Cronbach's alpha
Institutional Image	25	Infrastructure and Services	.949
		Faculty Characteristics	.750
Student Satisfaction	31	Functional Quality and Fees	.903
		Reputation and Academic Exchange	.796
Student Loyalty	Not reported	Attitudinal Loyalty	.726
Perceived Educational Quality	Not reported	Facilities and Services	.853
		Academic Faculty Qualifications	.737

Table A2. Conceptual Domains and Illustrative Measurement Items

Construct	Conceptual domain	Illustrative item or measurement content
Institutional Image	Personal/Social Prestige	Institutional prestige and social recognition
Institutional Image	Interpersonal Transactions	Quality of institutional interactions
Institutional Image	Labour Market Insertion	Perceived preparation for professional integration
Institutional Image	Academic Level	Academic standards and institutional performance
Institutional Image	Physical Environment	Infrastructure and physical facilities
Student Satisfaction	Institutional attributes	Evaluation of the institutional attributes considered in the image scale
Student Satisfaction	Tuition fees	Satisfaction with tuition fees
Student Satisfaction	Teaching-related aspects	Relationship between institutional image and teaching-related aspects
Student Satisfaction	Institutional selection drivers	Factors influencing institutional choice
Student Satisfaction	Overall educational experience	Overall evaluation of the educational experience
Student Loyalty	Attitudinal commitment	Commitment and intention to maintain the relationship with the institution
Perceived Educational Quality	Facilities and Services	Evaluation of institutional facilities and services
Perceived Educational Quality	Academic Faculty Qualifications	Evaluation of academic staff qualifications

Table A3. Institutional Image Items Reported in the Manuscript

Item code	Item wording
c17_q	Speed and efficiency of administrative services
c28_q	Modern infrastructure and facilities
c14_q	Modern laboratory environments
c26_q	Social support systems for students
c6_q	Library infrastructure and access

Measurement and source note: Institutional image and student satisfaction were assessed using seven-point Likert scales, ranging from 1 (totally disagree) to 7 (totally agree). The measurement instrument was developed for this study based on the relevant literature and adapted to the higher education context. The factor dimensions and reliability coefficients reported in Table A1 correspond to the results of the PCA and internal consistency analysis presented in the manuscript.