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To cite this article: Damian Steppacher, Maria Auxiliadora Cannarozzo Tinoco, Carla Schewengber ten Caten & Arthur Marcon (2021) Assessing administrative service quality in higher education: development of an attribute-based framework (HEADSQUAL) in a Brazilian University, *Studies in Higher Education*, 46:9, 1785-1800, DOI: [10.1080/03075079.2019.1706076](https://doi.org/10.1080/03075079.2019.1706076)

To link to this article: <https://doi.org/10.1080/03075079.2019.1706076>



Published online: 23 Dec 2019.



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Assessing administrative service quality in higher education: development of an attribute-based framework (HEADSQUAL) in a Brazilian University

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ABSTRACT

This paper proposed a valid and reliable perceived quality assessment framework of administrative services in Higher Education Institutions (HEI) in the Brazilian context. The method was in two main stages: (i) map a set of quality attributes and dimensions for administrative services in HEI, (ii) build and test the perceived quality assessment framework and data collection instrument of the administrative services in a HEI. The theoretical contributions of this manuscript were the differentiated scope with a focus on administrative services in HEI, since most of the previous research addresses the area of education (final service), and the development of a specific framework for assessing administrative service quality. The managerial implication highlight was that this study can be reapplied to other HEI to improve existing services quality assessment and control instruments. Adopting the proposed structure, the HEI could promote improvements in administrative services quality and advance in the quest for excellence.

KEYWORDS

Service quality assessment; quality assessment framework; administrative quality attributes; administrative services; higher education institution

1. Introduction

The services sector plays an increasingly important role in the global economy and the countries' growth and development and is considered crucial to the achievement of the United Nations Millennium Development Goals, such as poverty reduction and access to services such as education, water, and health services (UNTACD 2013). In this way, services are indispensable for the functioning of a society, improving the quality of life and well-being of the citizens and the general performance of the economies of the countries (OECD 2005; Fitzsimmons and Fitzsimmons 2014).

In the same way, delivering higher levels of quality of service is perceived as a critical success factor and an increasingly used strategy for more effective market positioning and higher profitability (Seth, Deshmukh, and Vrat 2005; Ladhari 2009; Pérez Rave and Giraldo 2014). Over time, many researchers and practitioners have dedicated efforts to improving concepts and techniques, as well as to develop reliable and replicable tools to assess the quality of services, due to the positive impact that the quality of services has on organizations (Miguel and Salomi 2004; Seth, Deshmukh, and Vrat 2005; Ladhari 2009).

Despite the popularity and widespread application of various service quality assessment models, they tend to present theoretical and empirical difficulties, suggesting the exploration of other

constructs to measure service quality, which is considered complex, multidimensional and influenced by the context of the service (Abdullah 2006b; Choudhury 2015; Sunder 2016). According to Brochado (2009), Quinn et al. (2009), Teeroovengadam, Kamalanabhan, and Seebaluck (2016), in the context of HEI, the importance of service quality is a consensus in recent literature, but putting an appropriate assessment into practice is challenging for both professionals and researchers because this environment is considered more complicated than in other services, mainly in understanding the needs and identifying customer.

The focus on students' perspective and attributes of the teaching process is a limitation of current Higher Education (HE) assessment instruments (Lagrosen, Seyyed-Hashemi, and Leitner 2004; Abdullah 2006a, 2006b; Quinn et al. 2009; Cledes, Cohen, and Wang 2013; Arslanagić-Kalajdžić, Kadić-Maglajlić, and Čičić 2014; Yildiz 2014; Choudhury 2015; Annamdevula and Bellamkonda 2016; Teeroovengadam, Kamalanabhan, and Seebaluck 2016). For those authors the instruments and frameworks should take into account the perspective of other groups, both internal and external to the educational environment, such as faculty members, administrative staff, alumni, parents, and community. These instruments should also consider other processes besides teaching, such as administrative work or services to the community in general, making it possible to compare stakeholders and services.

In general, there is no consensus on the best way to define and assess HE service quality, nor is there a single model of quality of service entirely accepted in this context (Clewes 2003). Consequently, over the time, several instruments to assess the service quality of HE have been proposed, such as SERVQUAL (Parasuraman, Zeithaml, and Berry 1988) and SERVPERF (Cronin and Taylor 1992) generic or adapted, which are the most used. Most recently, Abdullah (2006a) proposed the HEDPERF, which began to consider not only academic attributes but the entire higher education environment in the evaluation (Brochado 2009).

The quality assessment of public and private HEI in the Brazilian context is performed by the Ministry of Education (MEC), the National Council of Education (CNE), the National Institute for Educational Studies and Research (INEP), the National Commission for the Evaluation of Higher Education (CONAES), and Coordination for the Improvement of Higher Education Personnel (CAPES). The assessment of Brazilian Universities focuses on the quality of teaching and learning and is regulated by Federal Law No. 10,861 of 14 April 2004, known as the National Higher Education Evaluation System (SINAES). The SINAES is operationalised in evaluation cycles that include the global evaluation of the institution, the evaluation of courses, and the evaluation of student performance (Brasil 2004). However, Brazilian governmental metrics do not aim to measure administrative services accurately, as they are not the primary service in HEI.

Therefore, the present work intends to advance the knowledge on quality assessment of administrative services of HEI and to support compliance with quality standards, like ISO 9001. More specifically, we aim to fill the gap in the literature and practice (focus on teaching and learning aspects) and develop a specific instrument to assess administrative services which take place within HEI. Thus, the objectives that guided this research are (i) to identify a set of quality attributes and dimensions for the administrative services in HE, and (ii) to propose a valid and reliable framework to assess administrative services in HEI.

2. Review of literature

2.1. Service quality in HEI

Universities around the world entered a period of fast and radical change with the emergence of market-based administrative management and higher education models, a time when administrators have limited resources at their disposal (Shaw, Chapman, and Rummyantseva 2013). In this context, administrative services are an essential part of organizational planning of HEI and the development of academic activities. However, most of the research on HEI has neglected the

services provided by administrative staff, and focus on other HEI aspects (Arena, Arnaboldi, and Azzone 2010). Law (2013) and Agasisti et al. (2019) argue that attention should be paid to the non-academic experiences of students, who are considered clients of administrative services and significant stakeholders in education. Also, attention should be paid to other users, who also seek high-quality administrative services, regardless of their relationship with the institution, since the first contact of the different publics with an HEI is usually through administrative services (Kitchroen 2004).

HEI present a great variety of administrative services, such as allocation of physical space for classes, scheduling of rooms, academic records, issuance of diplomas and certificates, payment of suppliers, elaboration of international cooperation agreements (Arslanagić-Kalajdžić, Kadić-Maglajlić, and Čičić 2014). Providing guidance and advice on administrative issues are also considered vital services in HEI (Tsinidou, Gerogiannis, and Fitsilis 2010). On the other hand, the feeling created by the interpersonal relations between users of these services and the administrative team is not necessarily part of the service, but it can influence the evaluation of service quality (Sadiq Sohail and Shaikh 2004; Tsinidou, Gerogiannis, and Fitsilis 2010). In this way, it is fundamental that the administrative team be trained to meet expectations (Icli and Anil 2014), solve problems promptly and respond to demands in an appropriate way (Shanahan and Gerber 2004).

As noted by Wiers-Jenssen, Stensaker, and Grøgaard (2002), the quality of administrative services is as important as teaching in HEI. Arslanagić-Kalajdžić, Kadić-Maglajlić, and Čičić (2014) argue that even if the HEI has a high academic quality, the perception of this quality may fall if the administrative services lack quality. Sadiq Sohail and Shaikh (2004) state that balanced efforts should be promoted between administrative services teaching activities for HEI to achieve substantial results in overall quality improvement. Besides, the provision of quality administrative services directly contributes to the university's positive assessment (Icli and Anil 2014) and should not be underestimated (Wiers-Jenssen, Stensaker, and Grøgaard 2002). However, it is challenging to balance these two perspectives, as well as finding an HEI that has identified a suitable way for this (Arslanagić-Kalajdžić, Kadić-Maglajlić, and Čičić 2014).

In this way, the study of service quality in higher education implies considering the entire educational context, and it is essential to distinguish the services provided by the faculty members (who deliver the primary service) and the services delivered by the administrative team (who facilitate the process for the primary service) (Arslanagić-Kalajdžić, Kadić-Maglajlić, and Čičić 2014; Icli and Anil 2014). Moreover, the authors suggested that the assessment of these services should be managed separately, and can not be observed in an aggregated way or through the same attributes and standards since they contribute in a different way to the perception of quality. Also, universities should evaluate administrative services and factors affecting their quality from the perspective of individual users, to directly subsidize HEI's strategic decisions and support the delivery of the core service (O'Neill and Palmer 2004).

2.2. Service quality assessment in HEI

Service quality is one of the most important determinants of customer satisfaction (Parasuraman, Zeithaml, and Berry 1985, 1988; Schneider and White 2004; Oliver 2010) and it has been related to customer satisfaction (Schneider and White 2004) and service delight (Ahrholdt, Gudergan, and Ringle 2017) as relevant antecedents of customer loyalty in different service contexts. However, customer satisfaction and service delight are more associated with the emotional responses of customers during service experience, and thus are more evaluative and emotionally laden (Schneider and White 2004; Ahrholdt, Gudergan, and Ringle 2017). Whereas service quality is a judgment about overall excellence of services, and it is more descriptive and factual (Schneider and White 2004). In contexts with low hedonic consumption aspects like in an educational environment, where the main benefits are functionals (Ng, Russell-Bennett, and Dagger 2007), service quality is a good metric for service performance.

Additionally, service quality has been used as a measure of customer satisfaction based on the disconfirmation of expectations paradigm (Parasuraman, Zeithaml, and Berry 1985, 1988; Schneider and White 2004; Oliver 2010). Parasuraman, Zeithaml, and Berry (1985, 1988) were the first to propose a scale to assess service quality based on the discrepancy of customer expectations and perceptions of services called SERVQUAL. They argued that customers assess quality by comparing their expectations with real performance insights. Other authors found that perceptions of service performance better predicted service quality judgment than the gap between perceptions and expectations as in SERVPERF scale (Cronin and Taylor 1992).

Authors agree that consumers use standards rather than expectations to evaluate services (Cronin and Taylor 1992; Schneider and White 2004) and some researchers have applied Importance-Performance Analysis (IPA) in customer-based quality measurement to assess customers' view of service importance and performance, then identify the strengths and weaknesses of the services and determine improvement opportunities focusing on the elimination of dissatisfaction (Martilla and James 1977). IPA approach has been widely used for service quality assessment in a different context (O'Neill and Palmer 2004).

In the educational context, quality assessment is widely debated and accepted as relevant given the current competitiveness requirements that demand greater transparency and responsibility to society (Parasuraman, Zeithaml, and Berry 1988; Elassy 2015; Sahney 2016). In this environment, the challenges for quality assessment lie in identifying who the customers are and discovering their needs, making it clear that quality assessment in higher education is a complex process, because it includes many elements and clients, such as students, faculty members, administrative staff, society, studies, learning process and different evaluation methods that interact in a sophisticated way (Parasuraman, Zeithaml, and Berry 1988; Elassy 2015; Sahney 2016).

Elassy (2015) and Cardoso, Rosa, and Stensaker (2016) argues that even considering the existence of many participants in the educational environment, faculty members and students are considered the primary stakeholders in higher education. However, when students think about quality, they usually consider the performance of faculty members and the learning process. On the other hand, for the teaching staff, quality would be associated with bureaucracy and difficulties in their practice (Cardoso et al. 2019). Furthermore, faculty members would be concerned with processes to ensure quality in teaching, as well as the evaluation of their work by students (Elassy 2015).

Ramseook-Munhurrin, Naidoo, and Nundlall (2010) suggest that assessing service quality in HEI and understanding the influence of the factors assessed in the performance of the institution from faculty members perspective enable the organization to develop its service delivery processes and consequently, to provide better service to customers. Thus, knowing what educators expect may be essential to deliver quality services at an operational level in HEI environment (Ramseook-Munhurrin, Naidoo, and Nundlall 2010), and knowing administrative staff perception may bring technical knowledge about the organization (Agasisti et al. 2019).

On the other hand, O'Neill and Palmer (2004) and Teeroovengadum, Kamalanabhan, and Seebaluck (2016) conclude that assessment from student perspective has been widely used in several studies, given the understanding that quality in services could be defined as the difference between what the student expects to receive and their perceptions about what they actually receive. Even so, some researchers argue that students may not be able to have clear expectations about the services that involve education (Teeroovengadum, Kamalanabhan, and Seebaluck 2016).

As noted by Yildiz and Kara (2009) and Teeroovengadum, Kamalanabhan, and Seebaluck (2016), several studies have been structured to assess service quality in HE to gather the perspectives of both students and faculty members. The majority of these studies have applied the SERVQUAL as a research instrument. However, the application of SERVQUAL scale would require modifications to fit the needs for HEI service quality assessment, since there would be failures to work with the five dimensions proposed by SERVQUAL in this context (Choudhury 2015). As a result, some authors have proposed an adaptation to the SERVQUAL scale (Abdullah 2006a; Choudhury 2015) and

Yildiz and Kara (2009) stated that instruments such as SERVPERF are considered more useful for service quality assessment in HEI environments.

On the other hand, specific instruments and frameworks for HEI have been developed. Notable examples are HEDPERF (Higher Education PERFORMANCE-only) (Abdullah 2006a), designed as a generic tool for assessing universities under broader organizational perspectives; the HESQUAL (Teeroovengadum, Kamalanabhan, and Seebaluck 2016), which deals with previously explored dimensions with qualitative methods; the PESPERF Yildiz and Kara (2009), which evaluated the quality in a school of physical education and sports sciences, indicating that university units can have their specificities; the HEDQUAL (Icli and Anil 2014), a specific scale for masters courses. Thus, building on previous studies and on the analysis of the models proposed, the construction of a specific instrument with its factors and variables to evaluate service quality in HEI emerges as a need in this field (Jager and Gbadamosi 2010; Elassy 2015; Sahney 2016; Teeroovengadum, Kamalanabhan, and Seebaluck 2016).

3. Methods

The work method was based on the literature on service quality assessment in HE, converging to the SERVQUAL (Parasuraman, Zeithaml, and Berry 1985, 1988), SERVPERF (Cronin and Taylor 1992), and IPA (Martilla and James 1977) models and the respective approaches. As guided by these earlier studies, the first step was to identify attributes and quality dimensions for administrative services in HEI. To comply with this, we proceeded the bibliographical survey, qualitative analyses, tabulation of attributes and dimensions in an electronic spreadsheet, as well as the arrangement of attributes into the dimensions.

In the second step, a framework to services quality assessment was created based mainly on the structures proposed by (Parasuraman, Zeithaml, and Berry 1985, 1988; Tinoco 2011; Teeroovengadum, Kamalanabhan, and Seebaluck 2016). Also, the structure was validated by 13 experts, two graduate students, five faculty members, and six administrative employees, all linked to HE and directly linked to the studied HEI quality assessment. Interviews were unstructured and non-directed to explore the issue more broadly through open-ended questions in an informal conversation that provided the respondent with complete freedom to express their opinions (de Andrade Marconi and Lakatos 2011).

Additionally, based on SERVQUAL, on HESQUAL and General Structure proposed by Tinoco (2011), the electronic questionnaire (Appendix Table A1) was developed and tested and composed by closed questions, organized in three parts. The first and second parts were composed of 28 questions each, which constructed with positively worded statements to capture respondent's opinion through two separate Likert-type scales, one of importance and another of performance, ranging from 1 to 7 to evaluate the quality attributes. The seven-point Likert scale (Likert 1932) was adopted as recommended by studies specific to the HE context, such as in LeBlanc and Nguyen (1997), Abdullah (2006a), Mahapatra and Khan (2007), and Yildiz and Kara (2009), and suggested by three of the experts interviewed. According to Hair et al. (2005), Malhotra (2012), this scale is also considered suitable for applying the statistical procedures that were used in this study.

Moreover, the two perspectives approach (importance and performance) aims to verify the gap between them from the customer's point of view and has been widely adopted by researchers who use the IPA approach as reference (O'Neill and Palmer 2004). Since we are adopting IPA approach to operationalise the proposed scale based on comparing the importance level and performance level of service quality, we are not directly measuring respondents' expectations. However, the importance level is related to the expected satisfaction of the service, so the Importance-Performance paradigm also seeks to understand customer expected level of satisfaction and prioritise service attributes for improvement.

In the third step, aiming data collection for later tests, the evaluation instrument was applied at the Federal University of Rio Grande do Sul (UFRGS), a fully state-funded and free-of-charge university,

based in Porto Alegre, Brazil. The target population was composed of undergraduate students, faculty members, and administrative staff, all linked to the School of Engineering. It is essential to highlight that in the context of HEI, students play both the roles of service users and learners. Nevertheless, in this paper, we address students' role as a service user of administrative services offered by the HEI.

The types of sampling used were stratified sampling and simple random sampling (SRS). The sampling techniques adopted allowed satisfactory conclusions about the studied population, based on the statistical analysis. The techniques used are particularly crucial in the processes of inference on population parameters and factorial analysis (Barbetta, Reis, and Bornia 2004; Malhotra 2012). The sector to be evaluated and the respondent's link with the School of Engineering were defined as stratification variables in agreement with the school Dean. Thus, a total of 18 strata were obtained, from combining the six administrative sectors selected for evaluation and the three types of link, which are faculty members, administrative staff and undergraduate students.

Each stratum was set with equal samples of respondents to have the same accuracy in all inferences, regardless of the importance of each in the context, or to compare several strata, or to avoid distortions by attributes that present a higher incidence in the population (Ribeiro and Echeveste 1998; Barbetta, Reis, and Bornia 2004; Gil 2010; de Andrade Marconi and Lakatos 2011). The sample was calculated according to equation (1), applying the following parameters: (i) significance level (SL) of 97%, where $Z = 2.17$; (ii) a maximum error (ME) of 5%; (iii) population coefficient of variation (CV) of 5% (Ribeiro and Echeveste 1998). In this way, the number of five elements for each stratum was calculated, totalising a 90 members ($5 \times 18 = 90$) sample. The members of the population were randomly selected by simple random sampling procedure.

$$n = \left(\frac{(Z \times CV)}{ME} \right)^2 \quad (1)$$

The analysis of the structure was carried out in the next stage. Only responses from the perspective of performance perception were considered. To evaluate the adequacy of the obtained database, we verified the existence of outliers by analysis of means and standard deviations of the variables and errors of filling completion or missing values. The validity of the structure was tested using Exploratory Factorial Analysis (EFA) on the 28 items data of the performance perspective, through principal component analysis method using correlation matrix. The factor extraction was based on eigenvalue and scree plot variance analysis, and orthogonal rotation of factors by the varimax method (Hair et al. 2005; Malhotra 2012). All procedures and parameters adopted were indicated by Malhotra (2010, 623) for SPSS Windows Statistical Software (version 18.0.3). Afterward, the assessment framework's internal reliability was examined, using alpha coefficient (Cronbach 1951), also considered necessary in the context of HE, including to measure the degree of agreement among respondents (Clayson 2018).

In the last stage, experimental analyses were performed to test the framework's possibilities of managerial uses. Thus, Student's t-tests were used to test for the gap between importance and performance, as well as the analysis of variance (ANOVA), Bonferroni's Multiple Mean Comparison (MMC) and multivariate analysis of variance (MANOVA) to identify where the differences resided.

4. Results and discussion

4.1. Framework to assess administrative services quality of HEI

The framework presented in Table 1 was called HEADSQUAL, an acronym for Higher Education ADministrative Services QUALity, composed of two major dimensions and six secondary dimensions and 28 quality attributes, was developed based on literature review and qualitative analysis and data collection through in-depth interviews and focus groups with students, faculty members, and administrative services.

Table 1. HEADSQUAL framework.

	Dimensions	Attributes
(A) Personal aspects of the administrative services	1 – Behaviour and attitudes	1.1. Professional attitude 1.2. Kindness 1.3. Respect for diversity 1.4. Transmit reliability 1.5. Individual attention when needed
	2 – Technical knowledge, skills and know-how	2.1. Understand user needs 2.2. Interpersonal communication skills 2.3. Knowledge to provide the services 2.4. Capability to solve problems
	3 – Responsiveness	3.1. Available to provide service 3.2. Services provided with agility 3.3. Problems solved with agility 3.4. Changes are informed with agility
	4 – Reliability	4.1. Do the first time without errors 4.2. Services delivered as planned 4.3. Accurate and available records 4.4. Correct information 4.5. Professional character services
(B) Aspects of administrative services provision.	5 – Administrative procedures	5.1. Simple and standardised procedures 5.2. Appropriate waiting times 5.3. Transparency of official standards, rules, policies, guidelines, procedures 5.4. Automated systems and processes 5.5. Assurance of confidentiality of personal information
	6 – Communication channels	6.1. Convenient operating hours 6.2. Availability of various communication channels 6.3. Updated and useful communication channels 6.4. Ease of access to information 6.5. Accessibility of information for disabled people

The six dimensions presented in [Table 2](#) were mainly defined according to the studies of Parasuraman, Zeithaml, and Berry (1985, 1988), Tinoco (2011), Duarte and Tinoco (2015) and Teeroovengadam, Kamalanabhan, and Seebaluck (2016) and the attributes were arranged in these dimensions, taking into account the previous application, according to researched literature, and recommendations of the specialists.

Table 2. Secondary dimensions detailed

Dimension	Delimitation	Key authors
1 – Behaviour and attitudes	It refers to the behaviour and attitudes of AS taking into account the form of treatment, interpersonal relationships and interaction towards service users.	Parasuraman, Zeithaml, and Berry (1988), Smith, Smith, and Clarke (2007), Zafropoulos and Vrana (2008); Sultan and Wong (2010), Tinoco (2011), Teeroovengadam, Kamalanabhan, and Seebaluck (2016).
2 – Technical knowledge, skills and know-how	It involves the skills, abilities and knowledge of AS to provide support services.	Parasuraman, Zeithaml, and Berry (1985), Sultan and Wong (2010), Tinoco (2011)
3 – Responsiveness	Relating to the ability and availability of AS to provide services, as well as solve problems promptly.	Parasuraman, Zeithaml, and Berry (1988), LeBlanc and Nguyen (1997), Mahapatra and Khan (2007), Tinoco (2011), Choudhury (2015)
4 – Reliability	It deals with the reliability and assurance that administrative services are delivered accurately, as expected and without errors.	Parasuraman, Zeithaml, and Berry (1988), Abdullah (2005), Smith, Smith, and Clarke (2007), Zafropoulos and Vrana (2008)
5 – Administrative procedures	Refers to the clarity and structuring of administrative procedures for delivery of services, taking into account the standardization of processes, transparency and bureaucracy.	Parasuraman, Zeithaml, and Berry (1988), Abdullah (2005), Teeroovengadam, Kamalanabhan, and Seebaluck (2016)
6 – Communication channels	It concerns about communication, ease of contact and information.	Parasuraman, Zeithaml, and Berry (1985), LeBlanc and Nguyen (1997), Abdullah (2006b)

Moreover, the six secondary dimensions were organized into continuum logic within the services spectrum (Shostack 1977), which have predominantly intangible characteristics as displayed in Figure 1. Dimension n. 1 addressed more intangible elements, with very few physical evidences. Dimension n. 6 presented less intangible elements. Also, dimensions from 1 to 3 comprised attributes more related to personal aspects of administrative employees and dimensions from 4 to 6 were more closely related to aspects of administrative services provision.

Thus, dimensions (1) Behaviour and attitudes, (2) Technical knowledge, skills and know-how, and (3) Responsiveness were allocated in primary dimension named (A) Personal aspects of the administrative services. Whereas dimensions (4) Reliability, (5) Administrative procedures, and (6) Communication channels were allocated in (B) Aspects of administrative services provision.

4.2. Quantitative analysis of the proposed framework

The database did not present outliers according to the analysis of means and standard deviations, and the values of the answers were, for the most part, less than three times the standard deviation ($z \leq 3$). Also, no filling out errors or missing values were found. The sample was considered adequate by the Kaiser-Meyer-Olkin (KMO) test, which resulted in a value of 0.935. Malhotra (2012) recommends that the KMO value be greater than 0.5, and Friel (2007) recommends that values above 0.9 are considered excellent. Additionally, the Bartlett Sphericity Test (BST) was considered significant ($p\text{-value} = .000 < .05$) at a SL (α) of 5%. Furthermore, the correlation matrix presented a substantial number of coefficients above 0.30, indicating that data was appropriate for EFA procedures (Hair et al. 2005).

Considering the cumulative variance, the EFA confirmed that HEADSQUAL could be organized in two primary dimensions to assess the quality of administrative services, corresponding to 73.11% of the cumulative variance (Table 3). Hair et al. (2005) and Malhotra (2012) recommend that the accumulated data variance threshold be higher than 60%. The analysis of other criteria indicated by Hair et al. (2005) and Malhotra (2012) to determine the number of factors, such as the eigenvalue above 1.00, that indicated three dimensions, and the smoothing of curve in the scree plot (Figure 2), that indicated 2 dimensions, both were considered irrelevant, since there would be no significant gain of accumulated variance.

Additionally, the commonalities analysis of the attributes indicated that two attributes (assurance of confidentiality of personal information, and accessibility of information for disabled people) with a

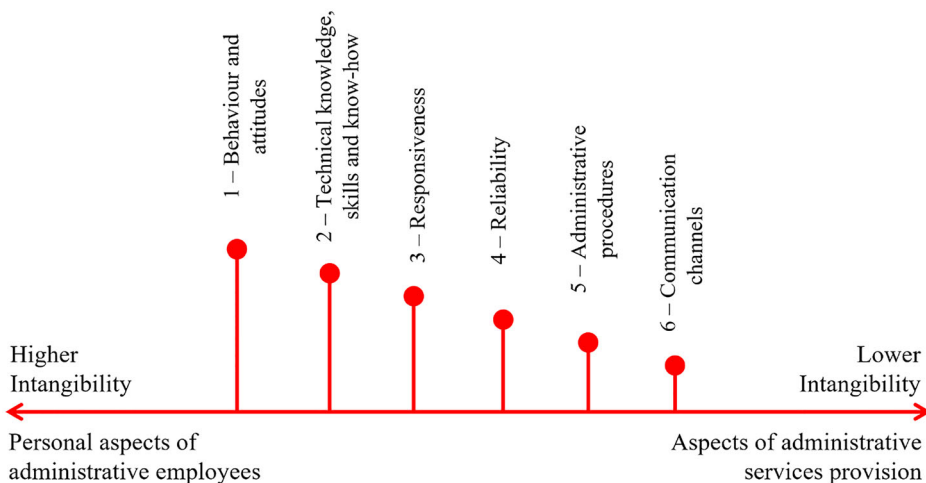


Figure 1. Adapted from Shostack (1977).

Table 3. Total variance explained.

Factors	Eigenvalues		
	Total eingenvale	% variance	Cumulative variance %
1	18.442	65.86	65.86
2	2.027	7.24	73.11
3	1.053	3.76	76.86
4	0.800	2.86	79.72
5	0.730	2.606	82.327
6	0.682	2.437	82.327
...
27	0.040	0.14	99.88
28	0.033	0.12	100.00

value below 0.500, considered the minimum threshold acceptable (Figueiredo Filho and Silva Júnior 2010). These two attributes were not effectively excluded from the assessment framework due to the exploratory nature of this study and as requested by the interviewed experts.

The reliability test of HEADSQUAL resulted in 0.98 for the alpha value (Cronbach 1951), with the generally accepted lower limit being 0.70 (Hair et al. 2005). On the other hand, the expected maximum value is 0.90; above this value, it can be considered that some items are measuring the same element of a construct (Streiner 2003). However, the results of these tests were satisfactory and aligned with the literature, and suitable to promote advances in administrative services quality assessment, increasing the knowledge about the proposed framework.

Furthermore, among the statistical analyses performed in this study to test the HEADSQUAL's possibilities of managerial implications, the Student's t-test identified that the quality IPA gaps of all assessed quality attributes are significant at the confidence level of 95% (Table 4).

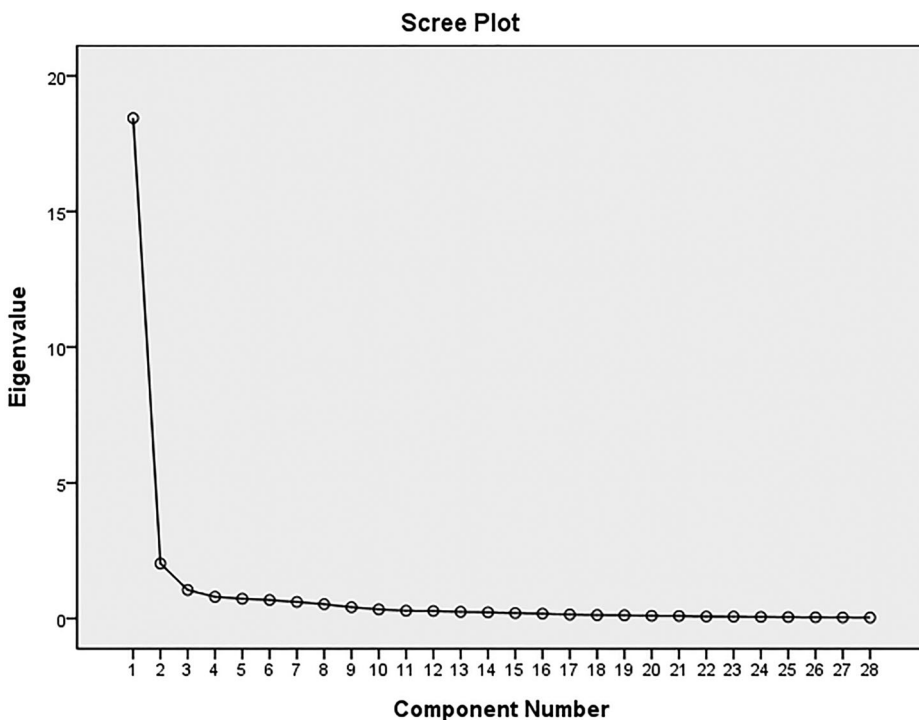
**Figure 2.** Eigenvalue vs. Number of factors.

Table 4. Analysis of importance and performance means.

Attributes	Performance (P) means.	Importance (I) means	Average gap (P-I) means	t-value	Sig. (2-tailed)
<i>Behaviour and attitudes</i>					
1.1 Professional attitude	5.46	6.63	-1.18	-7.25	0.00
1.2 Kindness	5.41	6.71	-1.30	-8.17	0.00
1.3 Respect for diversity	5.74	6.68	-0.93	-6.83	0.00
1.4 Transmit reliability	5.24	6.61	-1.37	-7.78	0.00
1.5 Individual attention when needed	5.43	6.30	-0.87	-5.11	0.00
<i>Technical knowledge, skills and know-how</i>					
2.1 Understand user needs	5.07	6.53	-1.47	-9.18	0.00
2.2 Interpersonal communication skills	5.06	6.27	-1.21	-6.98	0.00
2.3 Knowledge to provide the services	5.34	6.61	-1.27	-8.28	0.00
2.4 Capability to solve problems	5.18	6.61	-1.43	-8.18	0.00
<i>Responsiveness</i>					
3.1 Available to provide service	5.12	6.48	-1.36	-7.92	0.00
3.2 Services provided with agility	4.71	6.47	-1.76	-8.86	0.00
3.3 Problems solved with agility	4.58	6.43	-1.86	-9.13	0.00
3.4 Changes are informed with agility	4.47	6.33	-1.87	-9.00	0.00
<i>Reliability</i>					
4.1 Do the first time without errors	4.69	5.76	-1.07	-6.09	0.00
4.2 Services delivered as planned	4.88	6.49	-1.61	-10.01	0.00
4.3 Accurate and available records	4.68	6.31	-1.63	-8.88	0.00
4.4 Correct information	4.89	6.70	-1.81	-11.77	0.00
4.5 Professional character services	5.24	6.58	-1.33	-7.83	0.00
<i>Administrative procedures</i>					
5.1 Simple and standardised procedures	4.24	6.52	-2.28	-11.61	0.00
5.2 Appropriate waiting times	4.41	6.54	-2.13	-10.34	0.00
5.3 Transparency of official standards, rules, policies, guidelines, procedures	4.41	6.64	-2.23	-12.12	0.00
5.4 Automated systems and processes	4.44	5.89	-1.44	-7.61	0.00
5.5 Assurance of confidentiality of personal information	5.34	6.42	-1.08	-6.05	0.00
<i>Communication channels</i>					
6.1 Convenient operating hours	4.73	6.31	-1.58	-6.70	0.00
6.2 Availability of various communication channels	4.83	6.06	-1.22	-6.41	0.00
6.3 Updated and useful communication channels	4.66	6.56	-1.91	-10.80	0.00
6.4 Ease of access to information	4.39	6.60	-2.21	-13.02	0.00
6.5 Accessibility of information for disabled people	4.25	6.63	-2.38	-13.35	0.00

The ANOVA results, on the other hand, identified that the nature of link with studied HEI (undergraduate students, faculty members, and administrative staff) influences the IPA gap size in quality attribute assessment at the confidence level of 95% (Table 5).

Also, the ANOVA MMC results indicated a statistically significant IPA gap (IPA gap size = .848) between the faculty members' mean and the mean of administrative staff (Table 6). Finally, the MANOVA CMM results (Table 7) indicated that the perception of importance is equivalent among the respondent's profiles. However, the performance is perceived significantly differently ($p < .05$) when the administrative staff is compared to the other profiles.

Table 5. ANOVA Results.

	Type III Sum of Squares	DF	Mean Square	f	Sig.
Model	248.49	18.00	13.81	8.77	0.000
Sector	4.69	5.00	0.94	0.60	0.703
Link with HEI	12.89	2.00	6.45	4.09	0.021
Sector * Link	11.02	10.00	1.10	0.70	0.722
Error	113.37	72.00	1.57		
Total	361.87	90.00			

Table 6. ANOVA Multiple comparisons.

(I) Link with HEI	(J) Link with HEI	Mean Dif (I-J)	Std. Error	Sig.	95% confidence interval	
					Lower Bound	Upper Bound
Undergraduate students	Faculty members	0.100	0.324	1.000	-0.695	0.894
	Administrative staff	-0.748	0.324	0.071	-1.543	0.046
Faculty members	Undergraduate students	-0.100	0.324	1.000	-0.894	0.695
	Administrative staff	-0.848	0.324	0.032	-1.642	-0.054
Administrative staff	Undergraduate students	0.748	0.324	0.071	-0.046	1.543
	Faculty members	0.848	0.324	0.032	0.054	1.642

Table 7. MANOVA multiple comparisons.

Dependent Variable	(I) Link with HEI	(J) Link with HEI	Mean Dif (I-J)	Std. Error	Sig.	95% confidence interval	
						Lower Bound	Upper Bound
Importance	Undergraduate students	Faculty members	0.019	0.099	1.000	-0.224	0.262
		Administrative staff	-0.043	0.099	1.000	-0.286	0.199
	Faculty members	Undergraduate students	-0.019	0.099	1.000	-0.262	0.224
		Administrative staff	-0.062	0.099	1.000	-0.305	0.180
		Undergraduate students	0.043	0.099	1.000	-0.199	0.286
Performance	Undergraduate students	Faculty members	0.062	0.099	1.000	-0.180	0.305
		Administrative staff	0.119	0.312	1.000	-0.643	0.880
	Faculty members	Administrative staff	-0.792	0.312	0.039	-1.553	-0.030
		Undergraduate students	-0.119	0.312	1.000	-0.880	0.643
	Administrative staff	Administrative staff	-0.910	0.312	0.013	-1.672	-0.149
		Undergraduate students	0.792	0.312	0.039	0.030	1.553
		Faculty members	0.910	0.312	0.013	0.149	1.672

5. Conclusion

The purpose of this work was to construct a framework to assess the perceived quality of administrative services in HEI. The specific objectives were to map a set of administrative services quality attributes and dimensions in this context and to construct the instrument for assessing administrative service quality in HEI. As a consequence, we identified a series of studies that approached this theme through the literature review. However, few studies were dedicated to assessing only administrative services in HEI. In general, assessment models in universities focus on academic or infrastructure aspects. Nevertheless, we also discovered the importance of administrative operation and its influence on the performance of HEI, as well as the importance of assessing quality from the perspective of other stakeholders than just students, as widely used in literature.

From the literature review and the qualitative study, a set of 28 quality attributes were grouped into two major and six secondary dimensions that cover the personal aspects of the administrative staff (Behaviour and Attitude, Technical Knowledge, Skills and Knowledge, and Responsiveness) and aspects of administrative services provision (Reliability, Administrative procedures, Communication channels). In qualitative questionnaire, the expert's inputs were essential in capturing and checking organisational values and principles, integrating them into the framework. For example, the quality attributes 1.3 – Respect for diversity, 5.3 – Transparency of official standards, rules, policies, guidelines, procedures, and 6.5 – Accessibility of information for disabled people, are part of UFRGS Strategic Planning (UFRGS 2016) respectively as Diversity, Transparency, and Inclusion. Thus, the framework and the data collection instrument denominated HEADSQUAL were constructed and validated adopting the IPA approach (Martilla and James 1977), which assess the attributes of quality regarding importance and perception of performance.

This paper provides several theoretical contributions. Initially, it addresses administrative services in HEIs, which has received little attention in the literature but has been long called for in future research needs. Additionally, a framework was proposed for assessing the quality of administrative services with specific attributes and dimensions of this context; and the adoption of quality perception from three perspectives (students, faculty members and administrative staff), which allows statistical comparisons between respondents' profiles.

As managerial implications, this study can be reapplied in other HEI to improve existing assessment and control instruments by including administrative services in these structures. It can also be used to create quality performance indicators. Besides, the study adopted an approach to the final user of the service, knowing its perception of quality and aspects valued by them. The support of HEI's middle managers or sector leaders is recommended for the experimental application of this framework. Whereas, for its adoption and successful implementation and continuity as a quality assessment tool for administrative services in HEI, the commitment and involvement of top management such as chancellor and vice-chancellor are required for, as noted by Agasisti et al. (2019). Another managerial implication is that HEADSQUAL can be an easy-use tool to support the monitoring of organisational change processes or even as a trigger to initiate these changes, especially for gradual ones. It also makes it easier for those involved in assessing the quality of administrative services to be leaders and agents of change.

The proposed framework additionally facilitates the performance of statistical analyses that support the HEI administrative services management, such as the analysis of the gaps between importance and performance (IPA approach) of administrative attributes, list or matrix of priority issues by importance and performance, as well as the assessment comparison between respondent profiles. In this work, the experiments and analyses performed with collected data were used to study and validate the proposed framework.

Thus, in the studied context, the proposed assessment framework and statistical analyses proved to be able to capture the existence of a significant gap in importance and performance assessment of quality attributes, which can help managers to make accurate decisions to improve administrative services quality. Besides, a significant gap was identified between the perceived performance evaluations made by faculty members and administrative staff. In this way, the framework can be useful for practitioners to dedicate different efforts to quality improvement according to each profile of the university community member.

The results of applying HEADSQUAL for assessing administrative service quality in HEI indicate that the framework can guide managers in prescribing prioritisation of attributes for improvement and can also provide guidance for strategic development. Even though important attributes are performing well, and customers are satisfied, service quality assessment must be addressed continually in order to early identify changes in customer perceptions or new important service attributes that have not been previously considered but are relevant for customer satisfaction and retention.

Future research could eliminate potentially unnecessary items and adjust Alpha to fit between 0.80 and 0.90 (Streiner 2003). Besides, the assessment framework can be subjected to other statistical tests to increase validity and reliability. Another possibility is expanding the assessment framework by studying other current and relevant topics in the HE environment, such as administrative services to support students' mental health and safeguarding policies. Furthermore, it is possible to study adaptations of the proposed framework or the raised attributes in this research to complement the existing assessment structures or university league tables with the administrative perspective of the HEI. Also, future research could compare HEADSQUAL with other frameworks, such as HEDPERF, SERVQUAL, or SERVPERF, identifying differences and similarities of each model. Moreover, future research could test the proposed framework in the context of private universities, comparing results between public and private HEI.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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Appendix

Table A1. Questionnaire framework.

Importance perspective (I) I consider that ... 1 – Very little important 7 – Very much important	Scale () 1 () 2 () 3 () 4 () 5 () 6 () 7	Performance perspective (P) I currently ... That 1 – Strongly disagree 7 – strongly agree
Statements for importance and performance	I	P
1. The administrative staff have a professional attitude in the workplace.		
2. The administrative staff act with kindness and cordiality.		
3. The administrative staff respect diversity.		
4. The administrative staff transmit reliability in the provision of the service.		
5. The administrative staff give individualised attention when needed.		
6. The administrative staff understand the needs of users.		
7. The administrative staff possess interpersonal communication skills.		
8. The administrative staff demonstrate knowledge to provide the services.		
9. The administrative staff have problem solving skills.		
10. The administrative staff be available to provide service.		
11. The administrative services be provided promptly.		
12. The problems during administrative services delivery be solved promptly.		
13. The changes during the administrative services delivery be informed promptly.		
14. The administrative services be delivered without error the first time.		
15. The administrative services be delivered as planned.		
16. The records be made without errors and made available for consultation.		
17. The correct information on administrative services be provided.		
18. The administrative services have a professional character.		
19. The administrative procedures be simple and standardised.		
20. The administrative procedures have adequate waiting times.		
21. The administrative procedures be clear concerning their rules, rules, policies, guidelines and procedures.		
22. The administrative procedures be automated in systems.		
23. The confidentiality of personal information be guaranteed in administrative procedures.		
24. The operating hours of administrative services be convenient.		
25. Several communication channels be available (e-mail, phone, app, Facebook, face-to-face, website, etc.).		
26. The available communication channels be updated and useful (e-mail, phone, app, Facebook, face-to-face, website, etc.).		
27. The information on administrative services be easily available.		
28. The information on administrative services be accessible to persons with special needs.		
Profile		
1. Gender 2. Age 3. Link with the School of Engineering		
4. Link Time with the School of Engineering. / 4. Semester Range (only for students)		
5. Currently in a managerial position. (not for students)		
6. Level of education		
7. Undergraduate course (only for students)		