

Higher education service quality, student satisfaction and loyalty

Validating the HESQUAL scale and testing an improved structural model

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Abstract

Purpose – The purpose of this study is to validate the higher education service quality (HESQUAL) scale using a confirmatory approach and test an improved structural model that predicts student loyalty from image, perceived value, satisfaction and service quality. In addition to validating the HESQUAL scale using a confirmatory approach, two other main limitations in the extant literature are addressed.

Design/methodology/approach – The model is tested using data collected from 501 students enrolled in different higher education institutions in Mauritius. A two-stage approach to structural equation modeling is used whereby the measurement model is first tested using confirmatory factor analysis and followed by the assessment of the structural model.

Findings – Importantly, results indicate that student satisfaction is influenced by technical service quality, image and perceived value, but not by functional service quality. Both dimensions of service quality however are significant predictors of image and perceived value. The study uses a comprehensive measure of service quality and demonstrates that it is worthwhile to consider functional service quality as higher-order model and clearly distinguish between functional and technical quality, as both the technical and functional aspects play an important role in shaping students' perceptions and behaviors.

Originality/value – First, in the existing literature, service quality has not been considered as a second-order factor model in structural models of student satisfaction and loyalty, thus lacking either precision or parsimony. Second, the transformative quality aspect of higher education has been largely neglected in previous research testing such predictive models. The model delineates service quality into the functional and transformative (technical) aspects and treats functional service quality as a second-order factor comprising nine sub-dimensions.

Keywords Loyalty, Perceived value, Service quality, Satisfaction, Image, Higher education

Paper type Research paper

Introduction

Service quality and related marketing concepts such as customer satisfaction and loyalty have been rarely used in the higher education sector in the past. At most, they have been



seen as *ad hoc* components that added some value to universities, but not a necessity to their survival. However, the past decades have seen unprecedented changes in the landscape of higher education (Chong and Ahmed, 2015; Dennis *et al.*, 2016). Gone are the days when universities had a secured demand for their services. Institutions that were previously accessible to the societal elites only, now have to compete to attract students and gain market share. While only few prestigious universities still have the liberty of admitting students of their choice, the majority needs to compete in an open market characterized by a wide variety of choices (Latif *et al.*, 2017). Among the factors leading to such a competitive environment are the internationalization of higher education (Harvey and Williams, 2010; Sultan and Wong, 2010), the rise of private universities (Halai, 2013) and a decrease in state funding for public universities (Quinn *et al.*, 2009). These, accompanied by a general increase in tuition fees, have amplified the perception that higher education is now a private good rather than a public good (East *et al.*, 2014; Marginson, 2011; Nixon *et al.*, 2016).

As competition in higher education becomes intense, such concepts as service quality, student satisfaction, image of the institution and student loyalty that did not figure in the strategic plans of universities have suddenly become key ingredients for their survival (Dennis *et al.*, 2016; Manatos *et al.*, 2017; Psomas *et al.*, 2017). Largely influenced by the marketing literature, research on this topic has generally focused on higher education service quality (HESQUAL) and related concepts such as student satisfaction, perceived value and image (Alves and Raposo, 2007; Bassi, 2019; Brown and Mazzarol, 2009; Chong and Ahmed, 2012; Latif *et al.*, 2017; Pham and Lai, 2016). However, the application of quality and marketing concepts to higher education is still relatively at the infancy stage, resulting in a number of knowledge gaps.

Service quality in higher education comprises functional and transformative aspects (Teeroovengadum *et al.*, 2016). While the functional component of service quality relates to the delivery process (Brady and Cronin, 2001), transformative quality in education, as conceptualized by Harvey and Green (1993), relates to the technical aspect of service quality (Teeroovengadum *et al.*, 2016). Bearing this in mind, a first limitation of existing studies is that the notion of transformative service quality has been neglected in the majority of studies on service quality assessments and in student satisfaction and loyalty models for higher education institutions. An important goal of higher education institutions is the transformation of learners through teaching and learning (Leibowitz and Bozalek, 2015). While market-oriented initiatives of universities bring about various positive outcomes such as an increase in market share and better financial performance, too much focus on financial gains is detrimental to educational processes and outcomes such as the transformation of students. This is why researchers emphasize on the need for higher education institutions and researchers to focus on the notion of transformative service quality (Zachariah, 2007). One would have expected researchers to have assessed the transformative dimension of service quality in higher education as part of quality assessment exercises. Surprisingly, studies have omitted this dimension, making existing measurement scales and models of HESQUAL incomplete and theoretically limited.

Second, it is common for researchers interested in quality assessments in higher education to develop structural models which include service quality as a predictor variable (Alves and Raposo, 2007; Brown and Mazzarol, 2009). Such studies not only focus on the functional aspects of service quality, omitting the technical dimensions, but also conceptualize functional service quality as a unidimensional construct. However, in reality, functional service quality is multidimensional, comprising various sub-dimensions which several studies fail to consider (Ladhari *et al.*, 2011).

To address these limitations, the study develops and tests an improved structural model of service quality and student loyalty (Figure 1). Using the HESQUAL scale proposed by Teeroovengadam *et al.* (2016), the study considers the technical and functional aspects of service quality as two theoretically distinct concepts and analyzes their unique influence on image, perceived value and satisfaction. The latter three variables are in turn proposed to predict student loyalty. The study also considers functional service quality as a second-order factor comprising nine first-order factors. Such a model represents the hypothesis that the seemingly distinct, but related sub-dimensions can be accounted for by an underlying higher-order construct – functional service quality. A second-order factor model has several advantages such as explaining the covariance in a more parsimonious way, providing a theoretically error-free estimate of the specific factors and reducing the number of variables that can be tested in a structural model in a meaningful way without losing theoretical rigor (Koufteros *et al.*, 2009). Thus, the study uses a more comprehensive measure of service quality than existing ones. From these perspectives, this study makes a significant theoretical contribution to existing literature.

Literature review

Service quality in higher education

Service quality is defined as “a form of attitude related but not equivalent to satisfaction, and results from comparison of expectations with perceptions of performance” (Parasuraman *et al.*, 1988, p. 15). The most recognized service quality model is the SERVQUAL (Parasuraman *et al.*, 1988) which has been applied in quality assessment exercises in the higher education sector (Galeeva and Galeeva, 2016). However, despite its popularity, SERVQUAL is not without limitations. SERVQUAL focuses only on the functional aspects of service quality, neglecting the technical aspects and does not take into account the specificities of the higher education sector (Ladhari, 2009). Another model that has influenced studies on service quality in higher education is that of Harvey and Green (1993) and Harvey and Knight (1996). In this model, the researchers conceptualize quality in education as transformative quality which relates to the enhancement and empowerment of students. The researchers argue that education is not about presenting a service to a

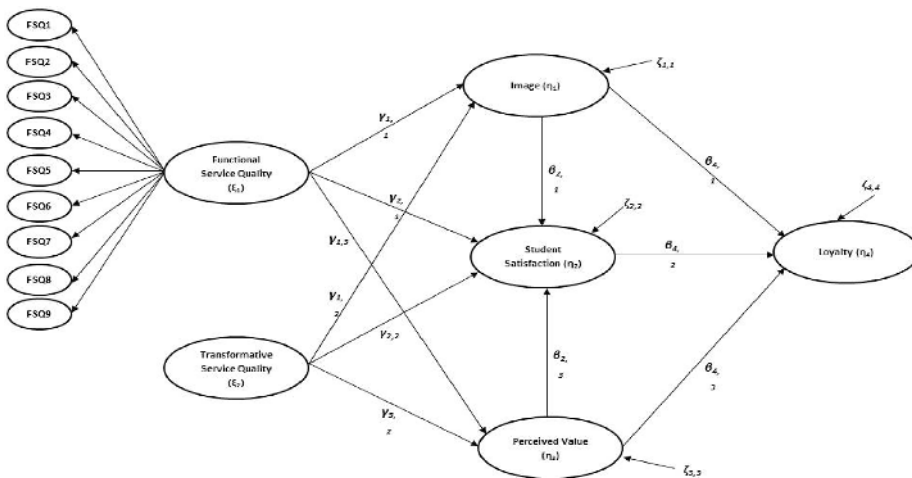


Figure 1.
The structural model
of the study

customer, but rather, it is a continuous process of transformation of students. Their view is strongly supported by empirical studies on the topic (Zachariah, 2007). However, this dimension of quality has been neglected in the majority of studies on service quality in higher education (Alves and Raposo, 2007). As technical service quality relates to the outcomes of a service (Grönroos, 1984, 1988), following Harvey and Green (1993), this study conceptualizes technical service quality as transformative quality in higher education. Using these dimensions, Teeroovengadum *et al.* (2016) developed the HESQUAL scale which is a hierarchical and holistic model of higher education service quality. In the HESQUAL scale, the specific attributes relating to the technical (outcome) aspect of service quality are based on Harvey and Green's (1993) and Harvey and Knight's (1996) conceptualization of transformative quality. The HESQUAL scale integrates both the functional and the technical aspect of higher education service quality and it therefore takes into account the proposition of the Grönroos (1984, 1988) and Brady and Cronin (2001). Using the HESQUAL scale, this study conceptualizes quality in higher education as comprising both functional and technical (transformative) service quality.

Image

Image is the general impression about an institution that any individual who knows about it retains in their minds (Barich and Kotler, 1991). In this study, the focus is on students' perceived image of the higher education institution. Empirical findings from various service settings provide evidence in favor of a positive relationship between service quality and image (Cheng *et al.*, 2008; Lai *et al.*, 2009; Wu, 2014). Kang and James (2004) differentiated between the functional and technical dimensions of service quality and tested their effects on image. The results revealed that both dimensions of service quality have a positive and significant influence on image. However, such relationships have been rarely tested in a higher education setting. Based on the preceding discussion, the following hypotheses are developed:

- H1. There is a direct positive relationship between students' perceptions of higher education functional service quality and their perceptions of the university's image.
- H2. There is a direct positive relationship between students' perceptions of higher education transformative service quality and their perceptions of the university's image.

Student satisfaction

Customer satisfaction can be viewed as a general assessment of the services being provided based on the experience gained during the provision of the service (Anderson *et al.*, 1994). It is a cumulative concept, rooted in a judgment made on the basis of a comparison of service to a standard (Oliver, 1997; Rojas-Méndez *et al.*, 2009). Empirical studies confirm that service quality is a strong determinant of customer satisfaction (Brady *et al.*, 2002; Cronin *et al.*, 2000; Wu, 2014). In a higher education context, a number of studies have tested the relationship between service quality and student satisfaction and found supporting evidence for it (Brown and Mazzarol, 2009; Dericks *et al.*, 2019). However, results are far from conclusive, probably because of the various conceptualizations of service quality and their related measurement issues (Bassi, 2019; Chong and Ahmed, 2012; Clemes *et al.*, 2013).

Image is another determinant of customer satisfaction (Andreassen and Lindestad, 1998; Kristensen *et al.*, 1999; Bloemer and Ruyter, 1998; Weerasinghe and Fernando, 2018). Andreassen and Lindestad (1998) posit that image is mentally constructed by customers

based on prior information received through indirect communication or through direct experience. They further suggest that image is “believed to create a halo effect on customers’ satisfaction judgment” as customers’ tend to have a preconceived idea about the products and services which stays in their mind. [Masserini et al. \(2018\)](#) found evidence of image being a strong predictor of student satisfaction in the higher education context. Based on the preceding discussion, the following hypotheses are formulated:

- H3.* There is a direct positive relationship between students’ perceptions of higher education functional service quality and their level of satisfaction with their university.
- H4.* There is a direct positive relationship between students’ perceptions of higher education transformative service quality and their level of satisfaction with their university.
- H5.* There is a direct positive relationship between students’ image of their university and their satisfaction.

Perceived value

Perceived value is an elusive and perhaps the most ill-defined concept in service marketing and management ([Carú and Cova, 2003](#); [Grönroos, 2011](#); [Grönroos and Voima, 2013](#)). The majority of definitions draws from the equity theory, postulating that customers evaluate what they receive from the product or service against what they give in terms of monetary and non-monetary resources ([Oliver and Desarbo, 1988](#)). From this perspective, [Kotler \(2003, p. 60\)](#), defines perceived value as “the difference between the prospective customer’s evaluation of all benefits and all the costs of an offering and the perceived alternatives.” Drawing from the work of [Holbrook \(1994\)](#), [Grönroos \(2011\)](#) notes that value is accumulated throughout the customer’s value-creating process and is uniquely, experientially and contextually perceived and determined by the consumer.

Perceived value has been identified as a major determinant of customer satisfaction. Drawing from Bagozzi’s coping framework ([Bagozzi and Youjae, 1988](#)), [Cronin et al. \(2000\)](#) postulates that perceived value is cognitively oriented and precedes satisfaction which is emotion-oriented. Several studies validate a positive relationship between perceived value and satisfaction. An influential study on the topic is that of [McDougall and Levesque \(2000\)](#) which was carried out across four different service sectors namely, dental services, auto service, hairstylist and restaurant. The research concluded that perceived value was one of the main explanatory variables in a model linking service quality, perceived value, satisfaction and behavioral intentions. Similarly several other studies in other specific services contexts found that perceived value had a significant direct positive effect on customer satisfaction ([Choi et al., 2004](#); [Chen, 2008](#); [Hutchinson et al., 2009](#)). In the higher education context, empirical research on the effects of perceived value has been limited and not conclusive. [Clemes et al.’s \(2013\)](#) findings suggest that perceived value does not have a significant effect on satisfaction of students. However, corroborating the findings from the mainstream literature, [Alves and Raposo \(2007\)](#) and [Brown and Mazzarol \(2009\)](#) note that perception of value has a direct effect on satisfaction of students in higher education. Given that results are still inconclusive to-date, more research on the relationship between perceived value and student satisfaction is required. Accordingly, the following hypothesis is formulated:

- H6.* There is a direct positive relationship between students’ level of perceived value and their satisfaction with higher education services.

The role of service quality as a major determinant of value perception has also been extensively studied (Andreassen and Lindestad, 1998; Brady *et al.*, 2002; Cronin *et al.*, 2000; Hellier *et al.*, 2003). Evidence provides support for a positive relationship between the two constructs. In a higher education context, such a relationship has rarely been investigated, with the exception of the studies by Alves and Raposo (2007) and Clemes *et al.* (2013) who validated a positive relationship between service quality and value perceptions. However, neither of the two studies conceptualized service quality in higher education as technical and functional. Based on this discussion, the following hypotheses are proposed:

- H7. There is a direct positive relationship between students' perceptions of higher education functional service quality and their perceived value.
- H8. There is a direct positive relationship between students' perceptions of higher education transformative service quality and their perceived value.

Student loyalty

Customer loyalty is "a deeply held commitment to rebuy or repatriate a preferred product or service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behavior" (Oliver, 1997, p. 392). Loyalty of students in the context of higher education involves such behaviors as giving positive word-of-mouth toward the university, recommending the institutions to others and choosing the same institution again in the future (Dado *et al.*, 2012).

Following the logic of the coping framework proposed by Bagozzi (1992), the greater the level of positive responses of customers, the more favorable will be their behaviors toward the services. Fornell (1992) suggested that the satisfaction of individuals' is a main predictor of customer loyalty. Subsequently, numerous empirical studies have empirically validated the relationship between customer satisfaction and favorable behavioral intentions across diverse service industries (Brady and Cronin, 2001; Cronin *et al.*, 2000; Hutchinson *et al.*, 2009; Ladhari, 2009; Wu, 2014; Zeithaml *et al.*, 1996). In the higher education context, several empirical studies report that student satisfaction positively influences student loyalty (Alves and Raposo, 2007; Brown and Mazarrol, 2009; Chong and Ahmed, 2012; Clemes *et al.*, 2013; Eskildsen *et al.*, 1999).

Image has also been found to influence customer loyalty in several studies. In a higher education context, Eskildsen *et al.* (1999), Alves and Raposo (2007) found image to be a strong determinant of students' loyalty. Similarly, perceived value has been found to be an important determinant of loyalty. The positive influence of value on loyalty of customers has been tested across different service settings by Cronin *et al.* (2000) who argued that it was necessary to integrate the concept of perceived value in predictive models of satisfaction and loyalty so as to gain a more holistic understanding of the interrelationships between these distinct but related variables. Their study revealed that perception of value had a positive and significant effect on behavioral intentions irrespective of the service context. The bulk of research that tested for the relationship between perceived value and behavioral intention in different specific service contexts, found a significant relationship between the two concepts (Choi *et al.*, 2004; Ryu *et al.*, 2008; Chen, 2008; Kuo *et al.*, 2009). The relationship between perceived value and loyalty has not been well studied in the context of higher education. A study which looked at this issue is that of Brown and Mazarrol (2009). The study concluded that perceived value has only a moderate positive effect on loyalty. The following hypotheses are therefore developed:

- H9. There is a direct positive relationship between students' level of satisfaction with their university and their loyalty.
- H10. There is a direct positive relationship between students' image of their university and their loyalty.
- H11. There is a direct positive relationship between students' level of perceived value and their loyalty with the higher education institution.

Methodology

Measures and questionnaire design

Measures of functional and technical service quality (1 = very low and 5 = very high) in higher education were developed in an earlier phase of this study (Teeroovengadum *et al.*, 2016). Items used to operationalize student satisfaction were adapted from Brady *et al.* (2002) and were measured on a five-point Likert scale where 1 = "strongly disagree" and 5 = "strongly agree." Perceived value was measured using items borrowed from Andreassen and Lindestad (1998) and Ryu *et al.* (2008). These items were measured using a five-point Likert scale, where 1 represented "very poor" and 5 represented "excellent." Image was measured using five indicators adopted from Lai *et al.* (2009). For these items, respondents were asked to rate their level of agreement on a five-point Likert scale where 1 represented "strongly disagree" and 5 represented "strong agree." Loyalty was measured using items on a scale where 1 = "very unlikely" and 5 = "very likely." This scale was adopted from Zeithaml *et al.* (1996).

Sampling design and data collection process

Data were collected using a convenience sampling strategy which is considered suitable when the purpose is to test a theory comprising relationships among variables, rather than making generalization (Balaji *et al.*, 2016). The questionnaire was administered to senior undergraduate and postgraduate students of various higher education institutions in Mauritius. The students were briefed about the study and the questionnaires were distributed accordingly and were self-completed. The sample size was chosen to meet the requirements for sound use of structural equation modeling, which according to Kline (2011) should exceed 200. In light of recommendations provided in the extant literature, a sample of 500 respondents was targeted and to account for potential unusable responses because of missing data and outliers 520 questionnaires were administered. A total of 501 valid responses were retained after screening for missing values and outliers.

Analysis and results

Sampling profile

The characteristics of the sample were benchmarked with those of the study population to ascertain that the latter was well represented. Table I provides the proportions of various demographic characteristics of students surveyed, namely, gender, age group, level of study, mode of study and institution type. The match between the sample and population characteristics was found to be reasonable. For example, in line with the study's population, it can be observed that among the sampled respondents, a majority of students were female (60.9 per cent, $n = 305$) compared to male students (39.1 per cent, $n = 196$).

Table I.
Profile of survey
respondents and
population
characteristics

Characteristics	Sample (<i>n</i> = 501)		Population (<i>N</i> = 30004)	
	Frequency(n)	(%)	Frequency (n)	(%)
<i>Gender</i>				
Male	196	39.1	13,048	43.5
Female	305	60.9	16,956	56.5
<i>Age group</i>				
18-21	317	63.3	n/a	n/a
22-25	94	18.8	n/a	n/a
>25	90	18.0	n/a	n/a
<i>Level of study</i>				
Undergraduate	404	80.6	26,679	88.9
Postgraduate	97	19.4	3,325	11.1
<i>Mode of study</i>				
Full-time	319	63.7	17,851	59.5
Part-time	182	36.3	12,153	40.5
<i>Institution type</i>				
Public	328	65.5	19,770	65.9
Private	173	34.5	10,234	34.1

Modeling process

As a first step of the modeling process, using AMOS Version 20, the fit of the second-order factor model of functional service quality with ten first-order factors (attitudes and behavior of administrative staffs, administrative processes, support infrastructure, learning setting, general infrastructure, attitudes and behavior of academics, curriculum, pedagogy, competence of academics and support facilities) was verified. Results are presented in Table II. The model displayed a poor fit ($\chi^2/df = 2.92$; CFI = 0.85; TLI = 0.84; RMSEA = 0.06). Therefore the model was respecified by deleting the first-order factors that had poor loadings on the second-order factor. This process resulted in the deletion of "general infrastructure" as a first-order factor. The revised second-order factor model with the nine first-order factors displayed a good fit to the data ($\chi^2/df = 1.96$; CFI = 0.93; TLI = 0.92; RMSEA = 0.04) and was therefore considered to be valid.

The modeling process followed the recommended two-step approach to structural equation modeling which involved testing the confirmatory factor model and the structural equation model (Anderson and Gerbing, 1988; Hair *et al.*, 2006). The overall measurement model showed satisfactory level of fit ($\chi^2/df = 1.73$; CFI = 0.93; TLI = 0.92; RMSEA = 0.04, Table I). The normed chi-square value was below the recommended threshold of 3.0 (Bagozzi and Yi, 1988; Hair *et al.*, 2006). CFI and TLI were both above the minimum recommended value of 0.9 while the RMSEA value was below the cut-off point of 0.05. The

Table II.
Model fit indices

	χ^2/df	CFI	TLI	RMSEA
Second-order factor model	2.92	0.85	0.84	0.06
Revised second-order factor model	1.96	0.93	0.92	0.04
Overall measurement model	1.73	0.93	0.92	0.04
Structural model	1.78	0.92	0.92	0.04

convergent validity of the measurement model was assessed using the three criteria recommended by [Hair et al. \(2006\)](#). First, for establishing convergent validity, the indicators (observed variables) should have significant factor loadings with regards to their respective latent variables. Second, the size of the standardized factor loadings of each indicator should be at least greater than 0.5. Third, the average variance extracted (AVE) should be greater than 50 per cent. As shown in [Table II](#), these criteria were met suggesting that the measurement model achieved convergent validity.

Discriminant validity refers to the extent to which a construct is distinct from other related constructs ([Hair et al., 2006](#)). Discriminant validity is established if the square root of AVE estimates for each construct is larger than their corresponding inter-construct correlations ([Fornell and Larcker, 1981](#)). As noted from [Table III](#), discriminant validity was achieved. Given these results, the structural equation model was tested. Results indicated that the fit indices were within the acceptable thresholds ($\chi^2/df = 1.78$; CFI = 0.92; TLI = 0.92; RMSEA = 0.04, [Table I](#)). Among the 11 hypothesized relationships proposed, nine were supported while two were found to be insignificant. Results are presented in [Table IV](#).

Discussion

H1 which proposed a positive relationship between functional service quality and image and *H2* which proposed a direct positive relationship between technical service quality and image were both supported by the study findings. The results suggest that higher level of technical and functional service quality leads to a more positive image among students. This is in line with the findings of existing literature. In the context of higher education, this relationship was tested by [Clemes et al. \(2013\)](#) and was found to be significant. More so, the results suggest that functional service quality is a stronger predictor of image than transformative (technical) service quality. Some analogous studies in other service sectors also considered the influence of technical and functional aspects as two distinct dimensions of service quality on image. In line with our findings [Kang and James \(2004\)](#) and [Silvestri et al. \(2017\)](#) report that functional service quality has the strongest influence on image compared to technical service quality. However, in their study on quality of service in the transportation sector, [Yilmaz and Ari \(2017\)](#) found that technical service quality had a stronger influence on corporate image than the functional service quality. It is difficult therefore to reach a consensus on the potential influences of the technical and functional aspects of service quality on image. It seems that the magnitude of the relationships is industry specific. However, in a higher education context, transformative service quality (technical) is a good predictor of image.

H3 and *H4* tested whether functional service quality and transformative service quality respectively influenced student satisfaction. Functional service quality was found to exert an insignificant relationship on satisfaction while results provided support for a positive relationship between transformative service quality and satisfaction. From a general perspective, the study joins those research that does not support a significant relationship between service quality and satisfaction ([Chen and Tsai, 2007](#); [Hutchinson et al., 2009](#)) as well as those that concluded a significant positive relationship between the two constructs ([Andreassen and Lindestad, 1998](#); [Ladhari et al., 2011](#); [Choi et al., 2004](#); [Olorunniwo et al., 2006](#); [Wu, 2014](#)). Likewise, in a higher education context, [Alves and Raposo \(2010\)](#) also reported a positive relationship between service quality and student satisfaction. These studies however considered only the functional aspects of service quality. [Kasiri et al. \(2017\)](#) and [Silvestri et al. \(2017\)](#) who rightly delineated service quality into the technical and functional aspects reported that both dimensions of service quality are significantly related

Indicators	Indicators	SL	t-value
<i>Functional service quality (second-order factor): AVE = 0.51; CR = 0.90</i>			
FSQ1	Attitude and behavior of administrative staffs	0.552	8.708
FSQ2	Administrative processes	0.570	8.498
FSQ4	Learning setting	0.769	CP
FSQ5	General infrastructure	0.780	10.148
FSQ6	Attitude and behavior of academics	0.723	10.605
FSQ7	Curriculum	0.762	9.744
FSQ8	Pedagogy	0.836	10.632
FSQ9	Competence of academics	0.790	10.560
FSQ10	Support facilities	0.587	8.917
<i>Transformative quality: AVE = 0.52; CR = 0.87</i>			
TSQ2	My university has enabled me to be more self-confident	0.721	16.908
TSQ3	My university has helped me to think more critically	0.799	19.150
TSQ4	My university has enabled me to have a higher level of self-awareness	0.807	CP
TSQ5	My university has helped me to develop problem-solving skills with respect to my field of study	0.719	16.855
TSQ6	My university has allowed me to transcend my prejudices	0.648	14.685
TSQ7	My university has enabled me to increase my knowledge and skills in general	0.610	14.011
<i>Image: AVE = 0.60; CR = 0.88</i>			
IM1	My university has a good academic reputation	0.804	20.064
IM2	Compared to other universities my university has a good image	0.713	16.990
IM3	Research output from my university is highly rated	0.711	17.285
IM4	Qualification gained from my university is externally perceived as being of value	0.799	23.209
IM5	My university is a prestigious university	0.850	CP
<i>Perceived value: AVE = 0.62; CR = 0.83</i>			
PV1	Reasonableness of university overall cost	0.660	15.040
PV2	Overall value you get from your university for your effort	0.839	18.915
PV3	Overall value you get from your university for your money	0.846	CP
<i>Student satisfaction: AVE = 0.65; CR = 0.92</i>			
SS1	My choice to enroll at my university was a wise one	0.822	25.344
SS2	This university is exactly what is needed for higher education studies	0.763	22.056
SS3	I did the right thing by choosing my university	0.904	CP
SS4	I am pleased to be enrolled as a student at my university	0.884	29.590
SS5	I am enjoying studying at my university	0.751	21.419
SS6	I am happy with my experience as a student at my university	0.703	19.178
<i>Loyalty: AVE = 0.69; CR = 0.90</i>			
BI1	Recommend your university to friends and relatives	0.789	21.701
BI2	Say favorable things about your university to others	0.743	19.692
BI3	Choose the same university again if you could start all over	0.920	27.831
BI4	Attend the same university if you follow another course in future	0.866	CP

Table III.
Psychometric
properties of the
measurement model

Notes: SL – standardized loading; CP – constraint parameters; AVE – average variance extracted; CR – composite reliability

to customer satisfaction in retail and tourism contexts, respectively. Furthermore, both research concluded that functional service quality had the strongest effect on satisfaction.

However in a higher education context as this study demonstrates, the technical aspect of service quality, conceptualized as transformative service quality, exerted a strong positive effect on students' satisfaction. Taken together, these empirical evidences (see, Table V) suggest that functional and technical service quality have differential effects on customer satisfaction and that such effects are context dependent. This particular finding shows that in the higher education context, the outcome of the service (technical quality) is more important than the service delivery process (functional quality). It also reinforces the claim of Harvey and Green (1993), who argued that quality in higher education is best conceptualized as transformative quality and also provide support for the need of including the technical dimension as in the HESQUAL scale when evaluating the quality of higher education services.

H5 postulated that image positively influence students' satisfaction with the higher education institution. Results provided support for this hypothesis and corroborate the numerous empirical studies in the generic marketing literature (Silvestri et al., 2017). Similar findings can also be found in a higher education context (Alves and Raposo, 2007; Clemes et al., 2013; Weerasinghe and Fernando, 2018). This implies that students' emotional response and evaluation of their cumulative experience is greatly influenced by the mentally constructed goodwill that they retain about their university. The strong effect of image on student satisfaction shows that students continue to attach much importance to the

	IMAGE	FSQ	SAT	BI	PV	TSQ
IMAGE	0.777					
FSQ	0.625	0.715				
SAT	0.743	0.546	0.808			
BI	0.678	0.475	0.804	0.832		
PV	0.497	0.557	0.575	0.433	0.786	
TSQ	0.527	0.582	0.565	0.476	0.409	0.721

Table IV.
Discriminant validity
between constructs

Note: Diagonal values are square root of AVE and off-diagonal are inter-construct correlations.

Hyp	Hypothesised parameter	Std β	SE	z-value	Result
H1	FSQ \rightarrow IMAGE	0.507***	0.089	7.991	Supported
H2	TSQ \rightarrow IMAGE	0.236***	0.066	4.374	Supported
H3	FSQ \rightarrow SAT	-0.070	0.080	-1.160	Not supported
H4	TSQ \rightarrow SAT	0.206***	0.053	4.464	Supported
H5	IMAGE \rightarrow SAT	0.557***	0.051	10.206	Supported
H6	PV \rightarrow SAT	0.272***	0.042	5.856	Supported
H7	FSQ \rightarrow PV	0.513***	0.100	7.570	Supported
H8	TSQ \rightarrow PV	0.115*	0.074	1.986	Supported
H9	SAT \rightarrow LY	0.692***	0.075	11.259	Supported
H10	IMAGE \rightarrow LY	0.190***	0.061	3.537	Supported
H11	PV \rightarrow LY	-0.056	0.045	-1.355	Not supported

Table V.
Results of hypothesis
testing

Notes: FSQ: functional service quality; TSQ: transformational service quality; SAT: satisfaction; PV: perceived value; LY: loyalty; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

reputation of their university, not only at the start of the consumption process but also during and after the consumption process.

H6 proposed that perceived value is positively related to students' satisfaction. Results provided support for this hypothesis, corroborating past empirical findings from the higher education literature (Alves and Raposo, 2007; Brown and Mazzarol, 2009). Therefore, as suggested by the equity theory the more students' view that the trade-off between what they give and what they receive in return to be adequate, they tend to have more favorable emotional responses toward the university. In addition to being offered high quality services and taking pride from their university prestige, akin to customers in other service industries students also expect a fair deal.

The study also hypothesized that the two dimensions of service quality, namely functional (*H7*) and transformative (*H8*) positively influence the perception of university value. Results provided support for both hypotheses. However, functional service quality has a stronger effect on perceived value than the technical component. The results seem to confirm those in the existing literature, although the majority of them did not explicitly distinguish between functional and technical aspects of service quality (Andreassen and Lindestad, 1998; Brady *et al.*, 2002; Cronin *et al.*, 2000; Hellier *et al.*, 2003). It is worth highlighting here that while technical service quality matters most in explaining satisfaction level of students, it is functional service quality which is the strongest predictor of perceived value. This indicates that when evaluating the trade-off between the benefits receive and what they forego, it is the delivery process such as campus facilities, administrative procedures and physical infrastructure which are more important. This can be explained by the fact that as advocated by Grönroos (2011), value is incrementally gained throughout the service experience and variation are more likely to occur during the delivery process with regards to the functional element of service quality.

H9, *H10* and *H11* suggested that student satisfaction, image and perceived value positively influence their loyalty toward the higher education institution, respectively. Results provide support for *H9* and *H10*, indicating that higher level of students' satisfaction and more positive image leads to stronger loyalty behaviors toward the institution. This finding confirms the various empirical studies carried out in a higher education setting (Chong and Ahmed, 2012; Clemes *et al.*, 2013; Eskildsen *et al.*, 1999; Pham and Lai, 2016; Subrahmanyam, 2017). However, *H11* which proposed a positive relationship between perceived value and loyalty was rejected by the study findings. The non-significant relationship contradicts the majority of empirical studies on the topic (Cronin *et al.*, 2000; Choi *et al.*, 2004; Ryu *et al.*, 2008; Kuo *et al.*, 2009). Moreover, while the positive effects of satisfaction and image on loyalty are in line with Bagozzi's coping framework which posits that cognitive and emotional responses are antecedents of behaviors, the insignificant effect of perceived value does not support the theory. We find the possible explanation for it. The first one would simply be that given that perceived value does have a significant bivariate effect on loyalty, it is rendered insignificant in the structural model only because image and satisfaction are much stronger predictors of loyalty in the higher education context. Another possibility would be that the results are because of specific contextual factors, namely, the fact that public universities in Mauritius are partly subsidized by the government and therefore the fees are quite reasonable. Consequently there might not be enough variation in perceived value so as to substantially influence students' loyalty.

Theoretical implications

The study has important theoretical implications for future research in service quality. First, it validates the HESQUAL scale which is a holistic measurement scale which can be used to

measure service quality in the higher education context. Next, to the best of our knowledge, no studies in higher education have yet developed a structural model comprising a second-order functional service quality construct and the technical service quality construct together and investigated their unique influence on image, perceived value and customer satisfaction. The research demonstrates that both dimensions of service quality have their role in shaping students' image of the institution and value perceptions. Another important lesson from the research is that while functional service quality did not predict student satisfaction, technical service quality, conceptualized as transformative quality, was a good predictor of satisfaction. The empirical findings support the arguments that universities should consider themselves as agents of transformation, catering for the overall development of students and preparing them to face the realities of the new world defined by the economic and cultural agenda. Importantly, the findings demonstrate that by focusing on the transformative service quality aspect, universities will not only conform to one of their primary purpose which is to ensure that learners are transformed, but in doing so they shall also be successful from a marketing perspective. While the relationship between technical service quality and satisfaction has received mixed support in the generic marketing literature, researchers consider the functional and technical aspects as two theoretically distinct dimensions of service quality and recommend to avoid viewing the construct as unidimensional. Particularly in the higher education sector, technical service quality is essential in influencing students' perceptions and behaviors and should therefore not be ignored in similar future research.

Managerial implications

The study has important policy implications for managers of higher education institutions as well as educational planners. Competition in the higher education sector means that universities strive to maintain student loyalty (Pham and Lai, 2016). The findings suggest that university management can ensure loyalty behaviors by improving students' perceptions of the image of, value of and the satisfaction with their institution. Furthermore, the results suggest that image perceptions, value perceptions and student satisfaction are largely dependent on transformative (technical) service quality and functional service quality. These findings provide us with valuable information for policymaking in higher education. First, better perceptions of the transformative service quality are likely to lead to an improvement in students' perception of the image of and their satisfaction and perceived value with the institution. Consequently, universities should ensure that necessary internal processes are put in place to meet students' expectations with respect to higher education learning outcomes. Recognizing that students' transformation is central to learning (Harvey and Green, 1993; Mezirow, 2006), universities should improve on the technical aspects of service quality. Higher education managers should ensure that an important goal of the institution and its academic programs is to promote transformation of learners from students to full-fledge scholars and ready-to-work individuals. Institutions should ensure that academic programs provide learners with such tools to enable them re-examine the organization of assumptions that re-structure their feelings, thinking and attitudes, fostering their personal and academic growth. As Mezirow (1981, p. 20) argues, the goal of transformative learning through critical reflection is to develop in adult learners "a crucial sense of agency over ourselves and our lives".

In addition to ensuring the acquisition of disciplinary knowledge which remains a central component of university education (Johnes, 2006), universities should also cater for the development of graduates' metacognitive abilities which include self-efficacy, emotional intelligence and self-confidence, so as to empower them (Pool and Sewell, 2007; Harvey and Green, 1993; Knight and Yorke, 2002). Enhancing graduates' generic, disciplinary and metacognitive skills require universities to continuously improve their curricula and pedagogies. As observed by Barnett (2009), ensuring the transformation of students requires a re-examination of curricula and pedagogies. Higher education managers should also recognize that student satisfaction with and the image of the institution is also dependent on the level of functional service quality. Universities should therefore put in place quality management practices such as benchmarking so as to continuously improve the quality of service delivery processes.

Limitations and suggestions for future research

Despite the scientific approach adopted in this study, its findings should be interpreted in the light of the research limitations. First, the study relied on data collected exclusively from students enrolled in higher education institutions in Mauritius which is a developing nation where the university infrastructure (e.g. library and laboratory facilities, information technology services, classroom facilities, etc.) lag behind that of universities located in developed and industrialized countries. This may well have impacted on students' perceptions and behaviors with respect to their institutions and thus, on the magnitude of the relationships proposed in the structural model. It is therefore important for researchers to replicate the study in other countries so as to validate the findings.

Second, the study relied on data collected at one point in time. Students' perceptions of their institutions may change as they progress through their studies. It is therefore important that future studies are based on longitudinal data to capture the changing perceptions of students. Third, the study considered functional service quality as a second-order construct. However, the construct of service quality can also be represented as a third-order factor (Brady and Cronin, 2001). Although such an approach would not have allowed us to study the unique influence of the two dimensions of service quality on the outcome variables, it may be worthwhile for future research to consider service quality as formative higher-order construct given the methodological advantages of formative modeling and using alternative statistical modeling techniques such as partial least squares structural equation modeling.

Concluding remarks. The purpose of the study was to validate the HESQUAL scale initially developed by Teeroovengadum *et al.* (2016) and test an improved structural model of students' perceptions of service quality and their satisfaction and loyalty in the context of higher education. Despite the study's limitations discussed above, this research contributes to the existing literature by assessing the psychometric properties of the HESQUAL scale and providing empirical evidence with respect to its validity and reliability using a confirmatory approach. We therefore posit that the measurement instrument can confidently be used to assess the quality of services provided by higher education institutions. Moreover, by testing a structural model-linking service quality and outcomes such as student satisfaction, perceived value, image and loyalty this study not only confirms the predictive power of the HESQUAL model and its nomological validity but also empirically demonstrate the importance of technical quality as initially advocated by Grönroos (1982).

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