

Service Quality of On-Campus Student Housing: A South African Experience

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ABSTRACT

This study adds to the service quality literature on student housing, particularly within a South African context. The study proposes and confirms a modified model of SERVQUAL and assesses the quality of on-campus student housing at a South African university based on 430 respondents' expectations and perceptions. Exploratory, first- and second-order confirmatory factor analyses performed as part of the data analysis confirmed that on-campus student housing service quality can be viewed as a second-order construct defined by four first-order dimensions: interaction, empathy, general amenities, and room amenities. T-tests and ANOVA tests show that neither age nor gender relates significantly to service quality perceptions. The data also reveal a four-tier structure of service quality which can guide residence managers in allocating limited resources to those service dimensions students regard as most important, but least satisfactory.

Keywords: accommodation, higher education, on-campus student housing, residence, SERVQUAL, South Africa

1. INTRODUCTION

Restructuring (Bosch, Venter, Han and Boshoff, 2006), competitiveness (Oldfield and Baron, 2000), changing customer demands and a growing concern for quality assurance in higher education (Strydom and Strydom, 2004), force South African tertiary institutions to increasingly compete on service quality and customer satisfaction.

Past research into quality in an educational context focused mainly on *overall service quality* (e.g. Ford, Joseph and Joseph, 1999; Lagrosen, Seyyed-Hashemi and Leitner, 2004), *teaching quality* (e.g. Li and Kaye, 1998; Zhao, 2003), and *library quality* (e.g. Satoh, Nagata, Kytömäki and Gerrard, 2005). The *quality of student housing*, an important non-academic dimension of tertiary life, has been largely neglected. Only limited research (e.g. Burggraaf, 1997; Christie, Munro and Rettig, 2002; Price, Matzdorf, Smith and Agahi, 2003) could be traced.

Residence life is a unique student-experience associated with special benefits. Students who reside on-campus generally perform better than those who do not (Christie, et al., 2002); are better able to develop their social and personal, planning and organizing skills (Burggraaf, 1997); and are more likely to persist in their studies and attain personal and academic goals (Skahill, 2003).

The current study investigates the quality of on-campus student housing at a South African university, by developing a model, validating a measuring instrument and assessing the quality of the said accommodation at the Nelson Mandela Metropolitan University, a comprehensive South African university, boasting over 25 000 students.

2. SERVICE CLASSIFICATION AND MEASURES OF SERVICE QUALITY

Literature proposes numerous service classification schemes (e.g. Bitner, 1992; Schmenner, 1986; Silvestro, Fitzgerald and Johnston, 1992). In the context of Schmenner's classification, a university is a mass service organization (low interaction and customization with high labor intensity), while its student housing division is a

service factory (low interaction and customization with low labor intensity).

SERVQUAL has been a popular instrument for measuring service quality associated with aspects of tertiary education (e.g. Joseph and Joseph, 1997; Tan and Kek, 2004); as well as of accommodation (e.g. Getty and Getty, 2003; Juwaheer and Ross, 2003; Saleh and Ryan, 1991). The SERVQUAL model is founded on the argument that most consumers enter a service encounter with expectations formed on the basis of their knowledge and experience with the service (Joseph and Joseph, 1997). In a disconfirmation-based approach to service quality, quality is the difference between consumers' expectations and their actual experiences (Parasuraman, Zeithaml and Berry, 1988). Alternatively, following a performance-based approach, service quality is assessed by measuring consumers' actual experiences only (Cronin and Taylor, 1992). Our research follows a disconfirmation-based approach.

2.1 Service Quality as A Multidimensional Construct

Service quality is a multidimensional construct. The most widely reported set of service quality dimensions has been proposed by Parasuraman, Zeithaml and Berry (1985), comprising tangibility, reliability, responsiveness, competence, courtesy, credibility, security, access, communication, and understanding. These ten dimensions were later on condensed to five more comprehensive ones: tangibility, reliability, responsiveness, assurance, and empathy (Parasuraman, et al., 1988), forming the basis of the SERVQUAL instrument (Durvasula, Lyonski and Mehta, 1999). In the service factory situation, the dominant service quality dimensions were found to be tangibility, responsiveness and reliability (Olorunniwo, Hsu and Udo, 2006; Rosen and Karwan, 1994). In our research, we empirically test this argument in a student housing context. We therefore propose that:

- P₁:** Service quality of on-campus student housing is a multidimensional construct
- P₂:** On-campus student housing service quality are dominated by tangibility, responsiveness and reliability

2.2 Service quality as A Multilevel Construct

In addition to being multidimensional, the service quality construct is also hierarchical in nature (Brady and Cronin, 2001). This tenet reflects a relatively new direction in service quality research that differs from the traditional SERVQUAL conceptualization which dominated service quality research (Janda, Trocchia and Gwinner, 2002).

As a multilevel construct, service quality comprises three levels (from top to bottom): customers' overall perceptions of service quality, primary dimensions, and sub-dimensions (Dabholkar, Thorpe and Rentz, 1996). Based on this conceptualization, Brady and Cronin (2001) identified a third-order factor model where each of the three primary dimensions (interaction, environment, and outcome) has three sub-dimensions. The combination of these primary dimensions constitutes overall service quality perceptions.

Brady and Cronin's model has been successfully tested across four service industries: fast-food, photographic development, amusement parks, and dry cleaning. We wanted to test Brady and Cronin's model in a South African student housing context and hence propose:

- P₃:** Service quality of on-campus student housing is a multilevel construct that can be presented as a third-order factor model

2.3 The Gaps Model of Service Quality

Much research on service delivery has been done within the framework of the so-called gaps model of service quality (Parasuraman, et al., 1985). This model comprises four provider gaps and one customer gap, the closing of which is a logical basis for improving service delivery (Grönroos, 2007). The four provider gaps relate to:

- Understanding (Gap 1): the difference between customer expectations and management perceptions of customer expectations.
- Service standards (Gap 2): the difference between management perceptions of customer expectations and service quality specifications.
- Service performance (Gap 3): the difference between service quality specifications and the service actually delivered.
- Communication (Gap 4): the difference between service delivery and what is communicated about the service to customers (Zeithaml, Bitner and Gremler, 2006).

The four provider gaps affect the way in which service is delivered, and their existence leads to Gap 5, the customer gap. Gap 5 denotes the difference between customer expectations and perceptions (Tsang and Qu, 2000). A positive difference in Gap 5 results when customers' perceptions of a service exceed their expectations. A negative gap arises when expectations are not met, pointing to a need for service improvement (Silvestro, 2005). Our study focuses on the customer gap (Gap 5) and we hence propose that:

P₄: Significant gaps exist between students' expectations and perceptions of on-campus housing quality

2.4 Gender and Age Invariance

One potential application of SERVQUAL is the comparison of service gap scores across gender and age of respondents (Parasuraman, et al., 1988). Though investigating differences between genders might be critical for segmentation purposes, it has not been an overly popular research area mainly due to issue sensitivity (Babin and Boles, 1998). Only a few such studies (e.g. Abouchedid and Nasser, 2002; Burggraaf, 1997; Joseph and Joseph, 1997) investigated gender within an educational context.

As gender differences might indeed influence expectations regarding accommodation (Radder and Wang, 2006), its inclusion in our study was warranted, hence leading to our fifth proposition:

P₅: Significant differences in service quality gap scores exist in terms of students' gender

Similarly, few studies (e.g. Abouchedid and Nasser, 2002; Hill 1995; Tan and Kek, 2004) investigated age-related differences within an educational setting. However, mature students, having had more social experiences, might for example use different levels of assessment criteria when evaluating the student housing service and we hence propose that:

P₆: Significant differences in service quality gap scores exist in terms of students' age

3. RESEARCH DESIGN AND METHODOLOGY

3.1 Data collection

3.1.1 Sample

The population of the study comprised NMMU residential students residing in on-campus student housing. A proportionate quota sampling was used to identify 439 respondents at four campuses. Four hundred and thirty useable questionnaires were received by trained fieldworkers. Of these respondents, 48% resided on South Campus, 38% on North Campus, and 7% each on the 2nd Avenue and George campuses. Forty seven percent of the respondents were male, 53% were female; 60% were aged 18-21, 35% were 22-25 years old and 5% were older than 25. A third of the respondents had less than a year's experience of on-campus accommodation, 33% had between 1 and 2 years' experience and 34% resided on campus for over two years.

3.1.2 Questionnaire

The questionnaire comprised three sections. Sections A and B each contained 24 five-point Likert-scale questions which sought students' expectations (Section A) and their perceptions (Section B) of their accommodation. Respective end points were 1 = totally unimportant and 5 = extremely important, and 1 = strongly disagree and 5 = strongly agree. These 24 paired items constituted a modified version of the SERVQUAL instrument (Parasuraman, et al., 1988) with six proposed dimensions: reliability, responsiveness, assurance, empathy, general amenities, and room amenities. The last two dimensions replaced the tangibility dimension of SERVQUAL and resulted from the review of specialized literature and informal discussions with residential students. It furthermore addressed Carman's (1990) call for modifications to SERVQUAL tailored to different service settings. General amenities aimed at measuring the exterior elements (e.g. parking facilities) of the housing service, while room amenities aimed at measuring the interior elements (e.g. shower facilities) of the service.

Section C of the questionnaire contained dichotomous and multiple-choice questions which gathered information on the respondents' gender, age, campus of residence and residing period.

3.2 Data analysis and model validation

3.2.1 Exploratory Factor Analysis and Scale Purification

Exploratory Factor Analysis (EFA), using SPSS 15.0 (SPSS Inc. 2006a), Principal Components Analysis (PCA) as the factor extraction method and the OBLIMIN rotation with Kaiser Normalization as the rotation method, helped identify the latent dimensions of service quality. Rather than using the gap scores (perception minus expectation) in purifying a disconfirmation scale (Parasuraman, et al., 1988), we assessed the dimensionality of *both* the service expectation and perception constructs.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (0.933) and Bartlett's test of sphericity ($p < 0.000$) indicated that *service expectation* scores were suitable for EFA. Four factors, with eigenvalues greater than 1.0, resulted and explained 58% of the total variance ranging from 39% to 4% as reported in Table 1. One item (E20) was excluded as its loading on any resulting factor was lower than 0.4. Cronbach's alpha coefficients ranged from 0.67 to 0.88, indicating adequate internal consistency (Hair, Black, Babin and Anderson, 2010; Sekaran, 2000).

Similarly, the KMO value (0.949) and Bartlett's test of sphericity ($p < 0.000$) testified the factorability of *service perception* construct. The four-factor solution explained 66% of the total variance, ranging from 50% to 4% (Table 1). All the items loaded to a significant extent (greater than 0.4) and onto a single factor. Cronbach's alpha coefficients ranged from 0.75 to 0.93, reflecting adequate internal consistency (Hair, et al., 2010; Sekaran 2000). A number of items were excluded from further analysis because they did not load on similar expectation and perception constructs (shown in bold in Table 1), which also resulted in all the items proposed to measure the assurance dimension being excluded.

The finalized factor structure contained four factors. The first factor comprised seven paired items proposed to measure the reliability and responsiveness dimensions. Based on the nature of the items, this combined factor was renamed *interaction*. The second factor, called *empathy*, grouped together four paired items and focused on the ability of residence managers to provide customized service to students. The third factor, *general amenities*, comprised three paired items related to the exterior attributes of housing service. Finally, factor 4, termed *room amenities*, included six paired items depicting the interior attributes of housing service.

Table 1: Results of Exploratory Factor Analysis

	Service expectation construct				Service perception construct			
	F1	F2	F3	F4	F1	F2	F3	F4
E/P1		0.773			0.807			
E/P2		0.757			0.809			
E/P3		0.707			0.668			
E/P4		0.730			0.752			
E/P5		0.737			0.876			
E/P6		0.656			0.794			
E/P7		0.506			0.803			
E/P8			0.505		0.661			
E/P9			0.535		0.519			
E/P10			0.537		0.571			
E/P11			0.669					0.561
E/P12			0.842					0.797
E/P13			0.658					0.627
E/P14			0.562					0.562
E/P15				0.611		0.721		
E/P16				0.767		0.909		
E/P17				0.590		0.491		
E/P18	0.563						0.458	
E/P19	0.668						0.485	
E/P20							0.508	
E/P21	0.795						0.741	
E/P22	0.801						0.858	
E/P23	0.760						0.817	
E/P24	0.743						0.706	
Eigenvalue	9.39	1.82	1.67	1.04	11.93	1.52	1.33	1.02
Variance-factor (%)	39.12	7.57	6.96	4.34	49.72	6.32	5.55	4.27
Accumulated variance (%)	39.12	46.69	53.65	57.99	49.72	56.04	61.59	65.86
Cronbach's Alpha coefficient	0.87	0.88	0.84	0.67	0.93	0.75	0.89	0.86

Note: Factor loadings lower than 0.4 are not shown

3.2.2 Confirmatory Factor Analysis

As suggested by the EFA, a four-factor construct was proposed in the Confirmatory Factor Analysis (CFA) process. We adopted the competing models approach, which is deemed the strongest test of a proposed model because it identifies and tests several models that represent different hypothetical structural relationships (Durvasula, et al., 1999; Hair, et al., 2010). AMOS 7.0 (SPSS Inc. 2006b) was used to evaluate the competing models based on the Maximum Likelihood (ML) estimation method. Rather than assessing the dimensionality of service expectation and perception constructs *separately* in the EFA, we employed *difference scores* in the CFA to validate the disconfirmation model (Parasuraman, et al., 1988).

A first-order factor model (Model A) was subjected to CFA (Figure 1). Though the chi-square value was significant ($p < 0.000$), reliance on the chi-square test as the sole measure of fit in a structural equation model is not recommended due to its sensitivity to sample size, especially for cases in which the sample size exceeds 200 respondents (Hair, et al., 2010), as occurred here (430 respondents). Hence model fit was assessed by alternative fit indices (Durvasula, et al., 1999; Snepenger, King, Marshall and Uysal, 2006). Table 3 shows the results, which confirmed the acceptability of Model A.

Figure 1: First-Order Factor Model (Model A)

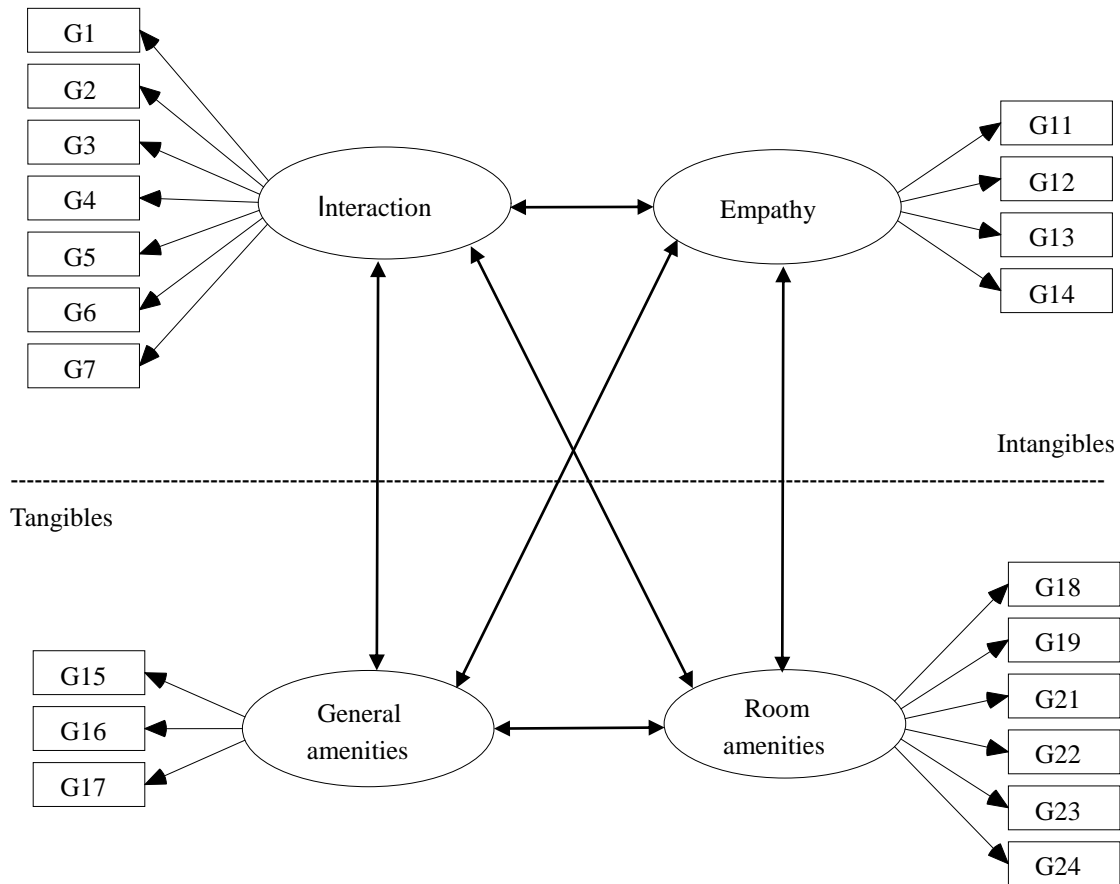


Table 2: Fit Measures of Competing Models

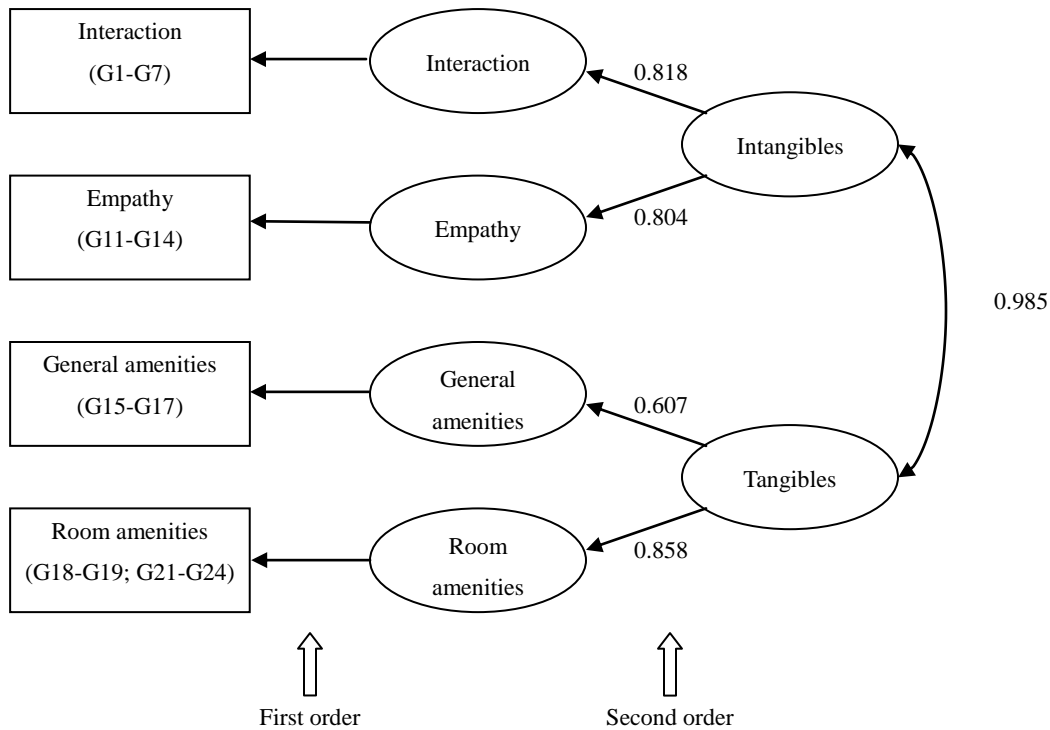
Fit index	Threshold	Model A	Model B	Model C
Chi-square value	-	581.84	605.63	605.54
Degree of freedom	-	164	166	165
P-value	≥0.05	0.000	0.000	0.000
Chi-square/df	1.0-5.0	3.55	3.65	3.67
GFI	≥0.90	0.88	0.88	0.88
AGFI	≥0.80	0.85	0.84	0.84
CFI	≥0.90	0.90	0.89	0.89
RMSEA	≤0.08	0.08	0.08	0.08

Construct validity of Model A was assessed in terms of convergent and discriminant validity. Convergent validity is established through high correlations between the measure of interest and other measures that are supposedly measuring the same concept (Aaker, Kumar and Day, 2007). The critical ratio (t-value) of our items varied from 6.29 to 16.36 and the standardized item loadings varied from 0.48 to 0.81, thus supporting the convergent validity of the constructs (Anderson and Gerbing 1988). Discriminant validity is established through low correlations between the measure of interest and other measures that are supposedly not measuring the same concept (Aaker, et al., 2007). Discriminant validity was evident, as the correlation between factors was lower than 0.8 (Yanamandram and White, 2006), ranging from 0.40 to 0.72.

We assessed model reliability by computing the Composite Reliability (CR) and Variance Extracted (VE). CR reflects the internal consistency of the construct indicators, while VE reflects the amount of variance captured by the construct indicators (Hair, et al., 2010). All factor CR scores (ranging from 0.77 to 0.89) were much higher than the recommended cut-off point of 0.7 (Olorunniwo, et al., 2006). Our VE scores ranged from 0.51 to 0.53, exceeding the recommended cut-off point of 0.5 (Fornell and Larcker, 1981). Thus, each of our factors reliably measured its respective constructs.

Next, a second-order factor model (Model B) was proposed to determine whether primary dimensions exist in the student housing context (Figure 2). In Model B, the four first-order factors were further categorized into two intangible factors (*interaction and empathy*) and two tangible factors (*general amenities and room amenities*). In other words, each of the two proposed primary dimensions (intangibles and tangibles) were expected to have two sub-dimensions. Model B showed a reasonable fit (see Table 2). However, discriminant validity was deemed poor due to high correlations (0.985) between the two proposed primary dimensions. Therefore, we concluded that primary dimensions and a consequent third-order factor model were not prevalent in the student housing context.

Figure 2: Second-Order Factor Model (Model B)



SERVQUAL literature (e.g. Kilbourne, Duffy, Duffy and Giarchi, 2004) suggests that dimensions of service quality should eventually combine to create a single measure of service quality. We hence proposed Model C as shown in Figure 3, with *student housing service quality* being viewed as a single second-order factor behind the four first-order factors. The model fit indices reported in Table 2 show that Model C was acceptable. Furthermore, significant positive relationships between the first- and second order factors exist, as evidenced by relatively high standardized loadings ranging from 0.602 to 0.848. Considering these results and the simplification of the models, Model C was deemed the preferred model description of on-campus student housing service quality when viewed from a competing models approach (Hair, et al., 2010).

Figure 3: Second-Order Factor Model (Model C)

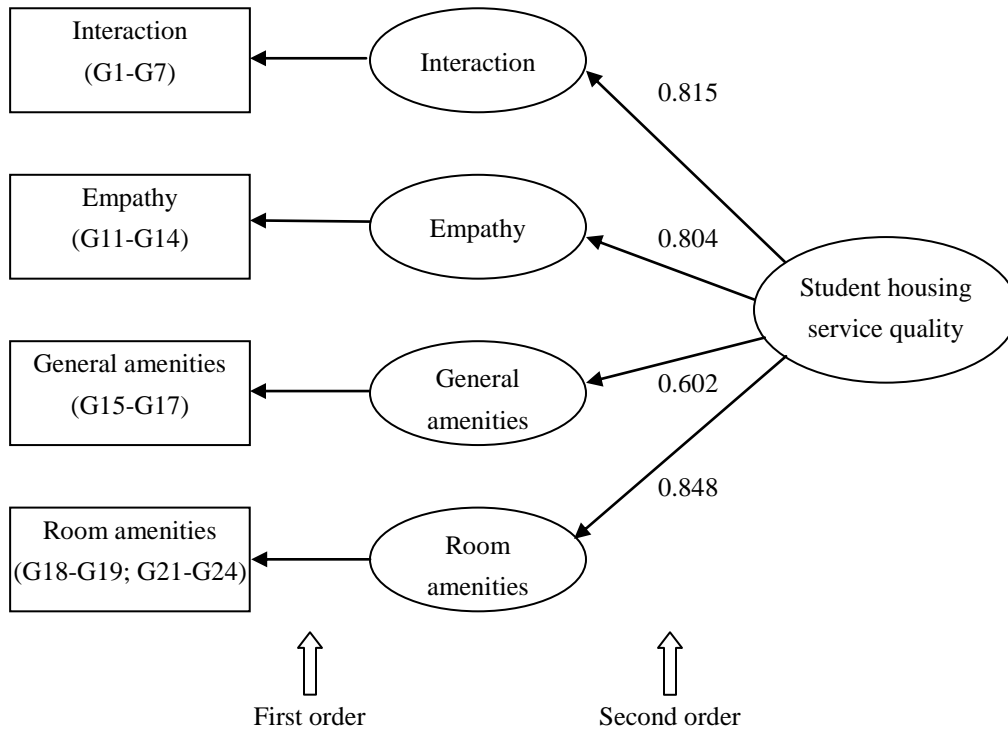
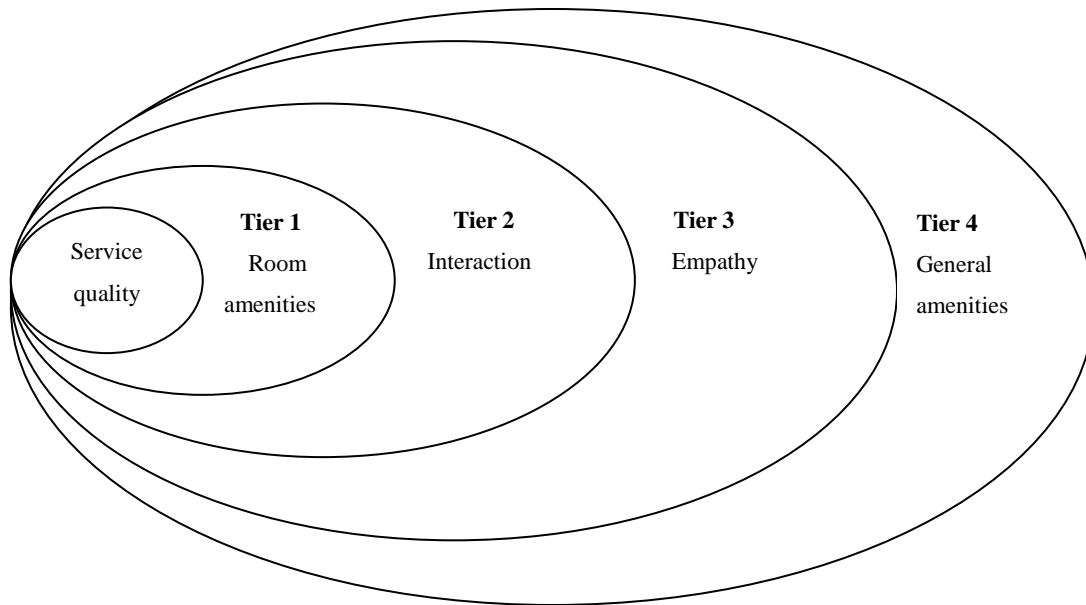


Figure 4: Four-tier Service Structure



4. RESULTS AND DISCUSSION

4.1 Service quality as A Multidimensional and A Multilevel Construct

Our results (Figure 1) showed that the service quality construct of on-campus student housing appears to comprise four dimensions: interaction, empathy, general amenities and room amenities. This confirms the multi-dimensionality of the construct (P_1).

We also examined the importance of our four first-order factors using the procedure proposed by Lai, Hutchison, Li and Bai (2007). As shown in Figure 3, *room amenities* had the highest loading (0.848) of the four factors, while *general amenities* (0.602) had the lowest loading. The loadings of *interaction* (0.815) and *empathy* (0.804) were in between. These results were used to build Figure 4, showing that the quality construct appears to have a four-tier structure. Proposition 2, denoting tangibility, responsiveness and reliability as the dominant service quality dimensions, is thus confirmed. As the CFA results failed to indicate a third-order factor model, Proposition 3 is only partially confirmed.

4.2 The Existence of A Service Gap

Table 3 summarized respondents' service expectations and perceptions. *Interaction* measured the skills and abilities of residence staff required to successfully interact with students. The largest gap in this dimension related to providing the promised service on time ($M = -1.02$), implying that residence managers were viewed as unreliable service providers who failed to keep promises. Other meaningful gaps were associated with ease of being contacted by students ($M = -0.89$) and ensuring error-free records ($M = -0.87$).

Empathy focused on the skills and abilities of residence staff in providing students with caring and individualized attention. The largest gap related to understanding the specific needs of students ($M = -0.80$), followed by residence managers having students' best interest at heart ($M = -0.76$). It is interesting that students regarded the use of simple language by the staff ($M = 3.93$) as the most important indicator of empathy.

General amenities, with the lowest factor gap score ($M = -0.47$), described the exterior attributes of housing service. The largest gap related to the availability of self-catering facilities ($M = -0.65$), which reflected students' disappointment with the current condition of kitchens and their desire for fully equipped kitchens. The availability of parking facilities ($M = -0.22$) had the smallest gap score, not only within this factor but also among all the items, implying satisfaction with this service item.

Room amenities had the largest factor gap score ($M = -1.05$). Students attached high importance to the interior designs of their rooms, but their expectations were not met. The gaps in this dimension were generally larger than in any other factor, once more highlighting the importance of room amenities in improving the service quality of student housing, as suggested by the four-tier service structure. Four items had gap scores exceeding 1: quality of bathroom and shower facilities ($M = -1.24$), good soundproofing between rooms ($M = -1.19$), reasonable cost of room ($M = -1.14$), and cleanliness and hygiene of room ($M = -1.06$).

All the gap scores were negative, ranging from -1.24 to -0.22. The gap score for overall service quality was -0.82, implying that the actual performance of residence management failed to meet students' expectations. As a result, students perceived a relatively low service quality of on-campus residences. A paired-samples t-test indicated statistically significant differences on all 20 observed attributes, four latent first-order factors and one latent second-order factor, as reported in Table 3. This supported Proposition 4.

4.3 Gender and Age Invariance

An independent-samples t-test showed no statistically significant differences in the gap scores between males and females for any of the factors. Similarly, one-way Analysis of Variance (ANOVA) showed no statistically

significant differences in the gap scores among the age groups. Propositions 5 and 6 were thus not supported.

5. CONCLUSIONS AND MANAGERIAL IMPLICATIONS

In our study, we adapted and validated the SERVQUAL instrument in a South African on-campus student housing context. We examined the dimensionality of the service expectation and perception constructs separately at the EFA stage before using the difference scores to validate the resulting dimension structure at the CFA stage.

Table 3: Comparison of Respondents' Perceptions and Expectations

Factor and item	Perception mean	Expectation mean	Gap score	T-value/Sig. level
Factor one: Interaction	3.25	4.10	-0.85	16.536**
G1 Providing the service right the first time	3.15	3.99	-0.84	12.838**
G2 Providing the service at the time they promise to do so	3.10	4.12	-1.02	14.009**
G3 Insisting on error-free records	3.26	4.13	-0.87	12.535**
G4 Being easily contactable by students	3.26	4.15	-0.89	13.123**
G5 Being willing to help students	3.39	4.17	-0.78	13.523**
G6 Showing a sincere interest in solving a student's problem	3.32	4.10	-0.78	11.742**
G7 Providing an effective solution to a student's problem	3.26	4.02	-0.76	11.201**
Factor two: Empathy	3.15	3.84	-0.69	12.801**
G11 Keeping students informed in language they understand	3.34	3.93	-0.59	9.059**
G12 Giving students personal attention	3.01	3.64	-0.63	9.051**
G13 Understanding the specific needs of students	3.10	3.90	-0.80	11.886**
G14 Having students' best interests at heart	3.13	3.89	-0.76	10.646**
Factor three: General amenities	3.50	3.97	-0.47	9.287**
G15 Availability of modern equipment	3.65	4.20	-0.55	8.932**
G16 Availability of parking facilities	3.58	3.80	-0.22	3.264*
G17 Availability of self-catering facilities	3.27	3.92	-0.65	8.806**
Factor four: Room amenities	3.20	4.25	-1.05	18.330**
G18 Availability of study related facilities	3.47	4.27	-0.80	11.159**
G19 Availability of safety and security	3.41	4.29	-0.88	12.515**
G21 Cleanliness and hygiene of room	3.24	4.30	-1.06	14.926**
G22 Quality of bathroom and shower facilities	3.04	4.28	-1.24	16.258**
G23 Good soundproofing between rooms	2.97	4.16	-1.19	15.536**
G24 Reasonable room cost	3.06	4.20	-1.14	14.373**
Average	3.25	4.07	-0.82	19.065**

Notes: *p<0.01; **p<0.001

Our results suggest that SERVQUAL may be a valuable tool for measuring the quality of an important non-academic element of South African student life. However, unlike the traditional five dimensions of service quality, four quality dimensions emerged: interaction, empathy, room amenities and general amenities. Assurance was found not to contribute to overall service quality of on-campus student housing. Although the interaction dimension in our study shares many similarities with the original dimension of reliability and responsiveness, our factor analysis indicated that interaction operates as a stand-alone dimension. Furthermore, the conventional tangibility dimension separated into two distinct dimensions, namely room amenities, aimed at measuring the interior design of the service, and general amenities, measuring the exterior design of the service. The fourth dimension, empathy, was similar to its conventional counterpart.

Our results provide support for Parasuraman, et al. (1988) and Carman's (1990) call for the modification to SERVQUAL tailored to different service settings.

In addition, our factor analysis showed a four-tier structure of SERVQUAL dimensions for on-campus student housing. The most critical elements comprising room amenities, the first tier, relate to bathroom and shower facilities and soundproofing between rooms. The second tier, interaction, includes keeping service-related promises and accessibility of management. Empathy constitutes the third tier and general amenities the fourth. It thus appears that management may better serve residential students by focusing on room amenities and their interaction with students, but it does not imply that general amenities has no role to play in overall service quality.

Although our study addresses a neglected element of overall service quality provided by tertiary institutions, it had several limitations. First, our study was exploratory in nature and was conducted in a single university. Second, it used a non-probability sampling. The generalizability of our findings is thus limited.

Several future research directions are suggested by this study. Further research is needed to first examine whether the adapted SERVQUAL instrument is valid in other South African universities and in universities abroad, and second, to validate the four-tier structure of on-campus student housing service quality dimensions. Lastly, each of the four provider gaps should be investigated to determine its contribution to the consumer gap.

AUTHOR INFORMATION

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