

## Research Article

# Developing Student Housing Quality Scale in Higher Institutions of Learning: A Factor Analysis Approach

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The researchers developed an instrument for measuring student housing quality (SHQ) in Higher Institutions of Learning (HIL) in Ghana. The paper sought to validate the student housing quality scale (SHOQUAL) through factor analysis approach. 700 respondents were sampled from two public HIL in Ghana in a cross-sectional survey that used a self-administered structured questionnaire for data collection. Confirmatory factor analysis (CFA) was conducted to detect the underlying latent variables that significantly determine SHQ in Ghanaian HIL. The findings indicate that four emerged SHQ dimensions relevant to the research context were labelled as follows: core facility quality, enabling facility quality, support facility quality, and cost of housing. The constructs in the derived model possess high reliability and validity. Student housing service providers could conveniently use the derived instrument items for measuring SHQ in HIL. Implications are discussed and limitations are noted. The paper contributes to the literature in the areas of models of service quality in student housing management in HIL.

## 1. Introduction

It is a fact that the increasing enrolment of students in HIL has been a major issue in recent times [1]. This trend has attracted attention of practitioners and scholars alike regarding student residential and nonresidential housing provision in higher institutions. As a result, other educational stakeholders have had to support government efforts, either in partnership with government or by solely providing private housing facilities for tertiary students on or off campus [1, 2]. In many developing countries like Ghana, student housing provision in HIL has not only mandated government policy for private participation in developing higher education institutions economy [3] but also the competition has gradually been keen in the provision of residential and nonresidential housing facilities for students [4].

Housing is unarguably one of the basic needs of man and the World Health Organization [5] defines it as “*the residential environment, neighbourhood, micro district or*

*the physical structure that mankind uses for shelter, and the environments of that structure, including all necessary services, facilities, equipment and devices needed for the physical health and social well-being of the family and the individual.*” Christina [6] and an ad hoc group of experts on social programming of housing in urban areas also strongly argued for housing in fulfilment of social needs. They maintain that housing serves as the area where the individual becomes capable of experiencing community and privacy, social well-being, and shelter and protection against hostile physical forces and disturbances. It also serves as the place for various socialisations, education, recreation, sports, social welfare and health protection services, shopping and transportation.

Housing promotes physical, communal, and economic as well as psychological gratification for the occupants [7] and provides leisure and reflects status [8]. Aside housing being a fundamental human right, adequate housing has

the potential of improving the civic, social, economic, and sustainable development goals of the nation. The delivery of housing is so inseparably connected with national socioeconomic development that, in spite of its perceived high cost on available asset resources [7], Ghana Government, past and present, still appreciates the need to make available, adequate housing units to meet the requirement of the working people [9] and students.

The need for business organizations, and for that matter student housing providers, to focus on improving service quality (SQ) in order to remain competitive and influence student customers' behaviour has long been recognized in the literature [10–12]. Service quality has been noted in many studies as a significant antecedent of customer satisfaction and customer loyalty [13–17]. Customer perceived quality of any service product is determined by the industry and nature of the service involved. This means that industry and service context would have unique requirements and determinants that will constitute critical quality factors that customers expect from service providers in that industry [18]. This has led to the proliferation of SQ models in the marketing, housing, and facility management literature. While existing literature on service quality for hospitality, housing, and its services in emerging economies context is limited, those that exist are country specific. As far as the researchers know, no empirical study has been conducted to examine service quality in student housing in higher educational institutions. This study, therefore, is important to provide empirical evidence on the conceptualization of the dimensions of student housing quality (SHQ) in HIL in order to further our understanding of SQ concept in hospitality, housing, and its services and to contribute to the theoretical debate in the marketing, education, and facility management literature regarding quality issues in higher (tertiary) education. Therefore the purpose of this paper is to identify the latent variables for housing quality dimensions most relevant to student housing in higher (tertiary) institutions in a Sub-Saharan African (SSA) country using factor analysis.

## 2. The Literature Review and Conceptual Framework

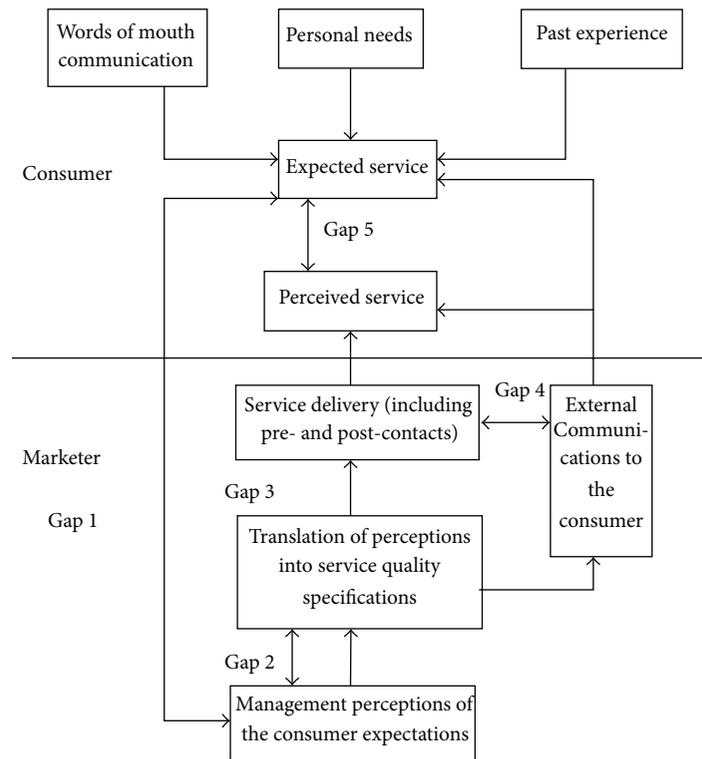
*2.1. Student Housing in HIL.* Previous studies suggest that further research is required to investigate whether the service quality dimensions proposed in service quality models apply to other different industry contexts [13, 18–20]. Though student housing in HIL appears to be a part of a group of housing service industry together with hotel, motel, and hostel, it is a unique service provision context in that it involves a situation where housing providers provide accommodation services for students who stay for a longer period, say a semester, more than normal reservation of a hotel or motel room. Aside this, the peculiar nature of learning experiences students undergo in higher (tertiary) institutions has some implications for what kind of quality of housing facilities that students expect from housing service providers in facilitating student learning.

Variety of forms of housing are provided by different institutions of higher learning, including a range of models

of ownership and marketing and a number of purpose built private sector developments. High quality housing is seen as an aid to marketing the particular university. For this reason, new and proposed housing from all sectors tends to be built to a much higher standard than traditional halls where the norm is normally of a simple bedroom with shared toilet and bathing facilities [21]. However, considering housing conditions in developing countries such as Ghana, conditions of leased buildings are often described as squalid and private student housing is practically unregulated. A ministerial report into student housing quality in South Africa [21] concluded that often HIL located in impoverished and remote areas often tend to either have unsuitable or unavailable student housing. As a result, academic learning and success are being severely constrained and hampered by overcrowding caused by shortage of student housing.

Also, it is common to see basic health and safety norms and standards being violated by the poor quality of student housing from the point of construction to the provision of facilities in the properties. One other aspect of student housing that needs to be accounted for is the provisions for physically challenged. According to Morgan et al. [22], the inclusion of facilities purposely built for disabled students must be considered. However, the lack of this is a common phenomenon in most developing countries particularly Ghana. The unfortunate long-term impact could be that not providing the minimum support for the physically challenged that is required to ensure a reasonable chance of success is not only irresponsible but dehumanising and could negate the intention of increasing access to higher education in those countries.

In many countries, especially in developing countries, the government has been the main provider of student housing for public HIL. As a result of limited government resources, the government in developing countries like Ghana is unable to adequately meet the housing demand for all public HIL. Over the past two decades, governments in many developing countries have involved private housing providers to participate in building hostels and halls of residence in order to meet the demand for more housing and housing infrastructure [1]. This has attracted many private individuals into investment in student housing particularly hostel accommodation. In Ghana student housing has become an important issue to educational managers, facility managers, housing sector managers, scholars, and many stakeholder groups because of the pressure and demand for more student housing and housing infrastructure in tertiary institutions [23]. With an estimated 9.7% enrolment rate in Ghanaian tertiary institutions [24, page 38], the government of Ghana over the last four decades have been encouraging the concept of private participation in socioeconomic development in many areas of the economy of Ghana including the provision of student housing [3]. As a result, tertiary institutions in Ghana have policies that invite private individuals to provide housing facilities in the form of hostels and halls to students. This has been successful through innovative financing arrangement between these private developers and the institutions. Even in this, prospective housing providers must comply with the rules and regulation regarding design and cost parameters



Source: Parasuraman et al. (1988)

FIGURE 1: The extended gap model of service quality.

and the kind of housing facility quality they ought to provide to the student tenants.

As a result of the influx of many student housing providers (SHPs) in Ghana higher institutions, there has been keen competition among the players and the quest for attracting more students has been a major concern for SHPs in Ghana. In effect, SHPs are increasingly concerned about the needs and requirement of students who serve as their customers. Many private housing developers are taking customer-driven initiatives that are intended to understand, attract, retain, and build intimate long-term relationship with profitable customers [11, 25]. In view of this, it becomes important to understand what critical housing quality factors students expect from SHPs.

*2.2. Theoretical Framework for the Study.* While the idea of quality can have diverse meanings and interpretations in different contexts, some of the earliest uses of the term can be traced to the management and marketing literature. In marketing and organizational management contexts, service quality (SQ) has been defined as the extent to which a service meets customers' needs or expectations [13]. In Parasuraman et al. [13], SQ is defined as a form of attitude, which could be related to satisfaction but not equivalent to it that results from a comparison of expectations with perceptions of performance. Parasuraman et al. [13] developed the SERVQUAL model for understanding service quality in meeting consumer needs and wants by management of firms.

The SERVQUAL model was originally proposed by Parasuraman et al. in 1985 and modified in 1988 in the Extended GAP model (Figure 1).

In their model, the authors conceptualised service quality as a five-dimensional construct, to develop the popularly known SERVQUAL instrument. The five SERVQUAL dimensions are: tangibles, empathy, assurance, reliable, and responsiveness. Tangibles are the physical facilities, equipment, and appearance of personnel. Empathy refers to the caring, individualised attention that the firm provides its customers. Assurance means knowledge and courtesy of employees and their ability to inspire trust and confidence. Reliability is the ability to perform the promised service dependably and accurately, and responsiveness refers to willingness to help customers and provide prompt service. The items for each of the dimensions have been modified in many previous studies to suit a particular context as noted by Parasuraman et al. [13, page 31] that the SERVQUAL instrument could be “*adapted or supplemented to fit the characteristics or specific research needs of a particular organisation.*”

Another earlier conceptualization of quality was provided by Grönroos [25]. According to the author, service quality is a three-dimensional construct, namely, technical quality; functional quality; and image (see Figure 2). He believes that the customer evaluations of perceived performance of service against his/her perceived service quality result in a measure of service quality. He explains technical quality as the quality of what consumer actually receives as a result of his/her

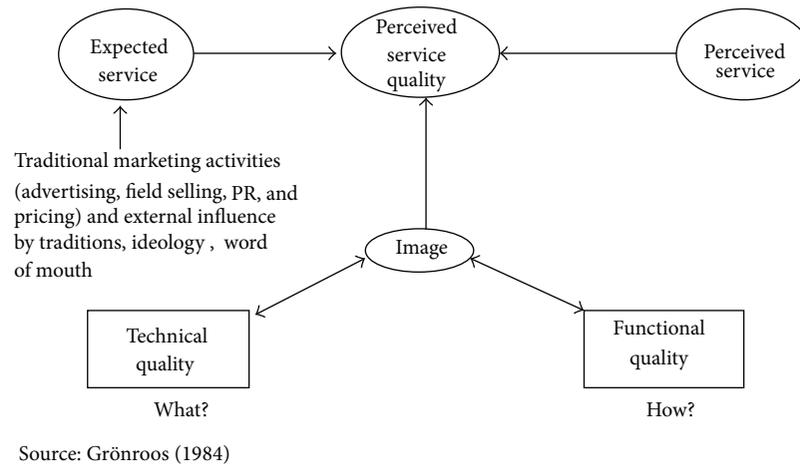


FIGURE 2: Grönroos' model of service quality.

interaction with the service firm and is important to him/her and to his/her evaluation of the quality of service. Functional quality is how he/she gets the technical outcome. This is important to him/her and to his/her views of service he/she has received. Image, which could be referred to as reputational quality, is very important to service firms and this can be expected to build up mainly by technical and functional quality of service including factors such as tradition, ideology, word of mouth, pricing, and public relations.

**2.3. Students' Housing Quality and Its Dimensions.** Based on the definitions of service quality, SHQ has been defined as the extent to which housing and its services meet students' needs and expectations in educational institutions [23]. Over the last two decades there have been several attempts by scholars to understand, evaluate, and identify key factors that determine housing quality in different contexts such as hotels, hostels, and motels. A review of the existing literature indicates that results from many previous studies identified different dimensions for service quality in different housing research contexts [26–30]. Many of these previous studies in the hotel and motel housing sector have identified critical dimensions such as physical environment, customer service, ambient factors, and physical facilities, among others [28–30]. Most of such previous studies were guided by the popular service quality model proposed by Parasuraman et al. [13], known as the SERVQUAL. While the SERVQUAL has been found useful, it has been criticized in its applicability and generalizability in many research contexts. Thus, in the housing literature, very little empirical studies have been published regarding student users evaluation of their housing quality in the student housing context. The study hopes to fill this void by providing empirical evidence on critical dimensions of student housing quality (SHQ) relevant to the student housing in higher institutions in developing country context.

In order to understand the dimensions of SHQ, the paper draws on existing literature on service product and its

components to develop a conceptual framework for the study. Lovelock and Wirtz [12] and Bo [31] maintain that the service product of any service context contains several components relevant to service providers. Normann [32] and Grönroos [10] have it that the service product could be classified into core service products and supplementary service elements. According to Normann [32], “the core service is the basic reason for a firm to be in the market. It represents the firm's basic competency in creating value with and for the client. It represents a complex set of benefits which may be difficult to analyze because some are physical, some are psychological and others are emotional” (page 46). Core service is that part of the entire service offering that is supposed to meet the most basic purpose for providing the service. In the context of student housing or hall of residence, the core service refers to the most basic reason for renting a student housing for a time period. Thus, the core service will include such things as bedroom, toilet, and bath facilities since these appear to be so basic that a student seeking a housing facility to rent would have to consider them probably first. Aside core service, the service product also consists of other supplementary services. Supplementary services have been variously described as auxiliary services by Grönroos [10], peripheral by Normann [32], and supplementary services by Lovelock and Wirtz [12]. Supplementary or customer services may include logistics services, advice, installation, and upgrades. Additionally, Grönroos [10] subdivides supplementary or peripheral services into enabling (facilitating) and enhancing (supporting) services.

Facilitating services (and goods) are those which are necessary for the core service to take place. Supporting services (and goods) do not facilitate the delivery of the core service but create added value for the client. In the context of student housing or hall of residence, facilitating or enabling services dimension of supplementary services are those necessary housing infrastructure that facilitate and make housing living comfortable and fulfilling. Facilitating services include housing infrastructure, for example, water, electricity,

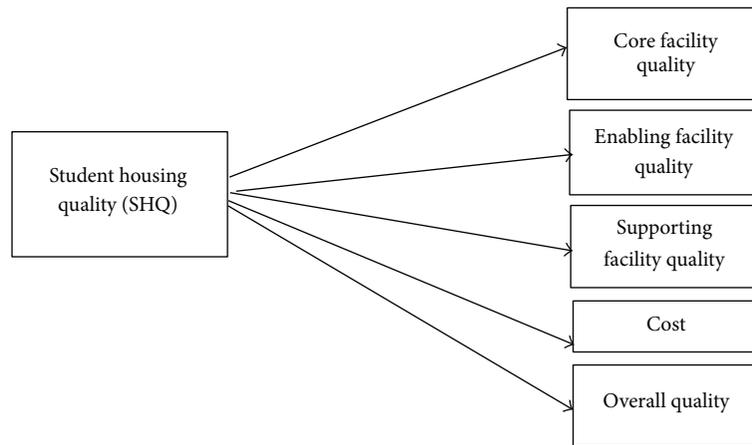


FIGURE 3: Conceptual framework for the study.

serviced roads, security, rules, and regulations, among others. Supporting services, on the other hand, may include such value added services desirable at student housing or hall of residence like junior common room, entertainment facility, reading room, library, ease of transportation to lectures, and garage, among other things. Supporting services are only desirable if they are available but may not be the most important in renting of student housing.

Apart from the core and supplementary aspects of student housing quality, the cost of the rents and the perceived overall quality of it could be important factors for evaluation of SHQ. In many service provision contexts, the price or cost paid by customers or users in acquiring a service in general, the housing service in particular, has long been found to be an important quality factor in product/service evaluation [23, 33–35]. The monetary and searching costs, among other costs, may affect students' choice and evaluation of the quality of the housing. Where students pay more, they are more likely to expect better housing service quality provision than those who pay less. Therefore, the conceptual framework for understanding SHQ in this study includes core and supplementary services, cost, and overall quality of student housing as depicted in Figure 3.

### 3. Methodology

**3.1. Population and Research Context.** The population consisted of students of two public higher institutions in Ghana, being College of Technology Education, Kumasi Campus of the University of Education, Winneba (COLTEK) and Kumasi Polytechnic (K-Poly). The University of Education, Winneba (UEW) is a Ghanaian public university established in 1992 and mandated to train professional teachers for all levels of education in the country. Currently, it has four main campuses located at Winneba, Kumasi, Asante-Mampong, and Ajumako, respectively. The mission of the University is to train competent professional teachers for all levels of education as well as conduct research, disseminate knowledge, and contribute to educational policies and development. The vision of the university is to be an internationally

reputable institution for teacher education and research. Kumasi Polytechnic is one of the famous Polytechnics in Ghana. It is located at the Garden City of West Africa, the capital city of the Ashanti Region of Ghana (Kumasi). The Polytechnic, known earlier as Kumasi Technical Institute, was established in 1954 but started actual teaching and learning in 1955, dealing mainly with craft courses. It became a Polytechnic on October 30, 1963, and from then concentrated on technician, diploma programmes, and a few professional courses. Following the enactment of the Polytechnic Law in 1992, PNDC Law 321, Kumasi Polytechnic ceased to exist in its previous form and became a tertiary institution. The Kumasi Polytechnic has since 1993 expanded from three faculties and one centre in 2009/2010 to six faculties, one school and two Institutes in the 2010/2011 academic year. It was ranked first among the polytechnics and 25th among the 51 tertiary institutions ranked in the 2013 university web ranking in the country.

**3.2. Sampling and Data Collection.** A convenient sample size of 700 respondents was chosen for the study, being 350 students from each of the two institutions. In order to collect data of high quality that reflect customers' opinion, a survey was conducted from the two institutions. To improve representativeness, data were collected from users of residential and nonresidential student housing types. Out of the 700 questionnaire administered, usable 466 were obtained representing 66.57% response rate for analysis. Out of the 466, 231 were obtained from COLTEK, while 235 were obtained from K-POLY constituting 49.57% and 50.43%, respectively. Data were collected in September 2012 during the second semester of the 2012/2013 academic year.

**3.3. Research Instrument.** A self-administered, structured questionnaire was developed based on three main sources, focus group interviews with students in higher institutions, the definition of housing by WHO [5], and other relevant literature reviewed [10, 12, 23, 32–35]. The instrument was pretested to a sample of twenty (10) students for refinement in order to get a more effective instrument. It was finally

TABLE 1: Measurement item and scale reliability for SHQ.

Code	Item of SHQ	CE	CA
CF1	Bedroom facility	0.691	
CF2	Bathroom facility	0.801	0.881
CF3	Toilet facility	0.784	
CS1	How affordable the housing fee is	0.647	
CS2	How easy or difficult it was when you were searching for your hostel or hall of residence?	0.655	0.652
EF1	Water supply	0.701	
EF2	Light/electricity availability	0.625	
EF3	Security facility	0.578	
EF4	The kind of rules and regulations governing the housing	0.536	
EF5	The cordial interpersonal relationship among tenants/students at the hostel/campus housing.	0.606	0.855
EF6	The behaviour of the landlord/lady or officer-in-charge of the hostel/campus housing	0.607	
OV1	The overall impression of the quality of the housing to me.	0.512	
OV2	<i>Overall reputation for housing quality of the hostel/hall</i>	<i>0.443</i>	0.655
SF1	Reading room facility	0.529	
SF2	<i>Kitchen facility</i>	<i>0.465</i>	
SF3	Garage facility	0.709	
SF4	Junior common room (JCR)/entertainment hall	0.639	0.767
SF5	<i>Distance from campus to residence</i>	<i>0.338</i>	
SF6	How the physical environment is pleasant and quiet for my study/learn.	0.661	
SF7	Availability of transport from the hall/hostel to lecture/classes.	0.506	
All 20 items (composite Reliability)			0.897

CE: communalities extracted, CA: Cronbach's alpha reliability value. Values in italic are below the acceptable communality value of 0.5.

administered to the target population through personal contact by researchers for nearly two weeks among students of campus residential and nonresidential housing types. The responses to the questionnaire items were a five-point Likert scale ranging from very unimportant, unimportant, neutral, important, to very important, coded 1 to 5, respectively. Moreover, the questionnaire items contained several sections as it was used for a larger study. It contained a section for demographic variables (gender, age, education, income, marital status, and student housing type) and a section for items of evaluation for the items of SHQ identified. Originally, there were 18 measurement items of SHQ for the section but two other variables (searching cost and overall reputation for accommodation) which were part of the preliminary sections were added because they were relevant for this paper. In all 20 items of SHQ were included in the analysis; these items are depicted in Table 1. For the initial validity and reliability of the instrument, the face and content validity were verified and established by two experts in research methodology. The item and construct reliability for all the 20 items and the proposed five dimensions of SHQ were ascertained using the Cronbach alpha generated from the output of SPSS 16.0 (see Table 1). It produced a composite value of 0.881 and construct reliabilities ranging from 0.652 to 0.881, most of which are

above the recommended minimum of 0.7 [36], except two items that were 0.652 and 0.655 that are close to 0.7.

### 3.4. Data Analysis Method

**3.4.1. Factor Analysis.** Factor analysis (FA) is a data reduction technique that uses correlations between data variables. It assumes that some underlying factors exist that explains the correlations or interrelationships among observed variables [37]. It has been used extensively in psychology, econometrics, marketing, sociology, and education [38–40]. Statistical data analysis for this study for FA followed the approach similar to the one used by Kettinger and Lee [41] and Nimako et al. [42]. Basically the steps involved are

- (1) exploratory factor analysis,
- (2) regrouping of items,
- (3) confirmatory factor analysis,
- (4) testing the validity and reliability of the emerged dimensions.

**3.4.2. Exploratory Factor Analysis (EFA).** EFA is a method that aims at extracting maximum variance from the dataset within each factor [37]. Costello and Osborne [43] strongly

recommended the use of principal component analysis since it has the ability to reveal the underlying structure of the latent variables with an appropriate rotation method. On rotation methods the varimax rotation methods is widely used, though maximum likelihood or principal axis factoring is recommended where the dataset involved is generally normally distributed or significantly nonnormal, respectively [43, page 2]. Based on the literature, the present study adopted the principal component analysis with varimax rotation methods of EFA. This was performed on all 20 items of SHQ. The EFA involved initial tests of individual item reliability using the item communalities with acceptable value of 0.5 and Kaiser-Meyer-Olkin measure to ascertain the suitability of the data for structure detection [44]. For simplicity of analytical purpose each statement of the questionnaire was coded as CF1, CF2, SF1, SF4, and the like (see Table 1).

On the criteria for selecting factor loading, generally factor loading above 0.6 is considered high while factor loading greater than or equal to 0.3 is considered moderately high [44]. Therefore the cutoff for analysing factor loading was 0.50. Next no items (row) should have multiple factor loadings greater or equal to 0.50. Lastly, no factors (columns) should have only one high loading item. Other factor loadings that do not satisfy the above criteria are considered meaningless and can be safely removed, while the high loading factors are critical factors and therefore can be retained. After the EFA, the next step in the data analysis is to perform a CFA on the remaining SHQ items using principal component analysis extraction method with varimax rotation to confirm the dimensionality of the derived instrument.

## 4. Results

**4.1. Respondents' Characteristics.** For the characteristics of the respondents, in terms of gender, 61.2% of the respondents were males and 38.8% were females. 2.1% were below 20 years, 92.7% of the respondents were within the ages of 20–35 years, 4.3% were between 36 and 45 years, and 0.9% were 45 years and above. This implies that the majority of them were in the economically active population. All respondents were educated with about 39.9% of them pursuing diploma programmes, 57.7% of them pursuing bachelor's degree, and 2.3% pursuing master's degree programmes. In terms of marital status, 89.7% of them were singles, who were not married, while 10.3% of them were married. Generally, this depicts that most of them respondents were young bachelors and spinsters who are preparing for responsible family life. In terms of housing type, 66.5% were using nonresidential student housing facility, notably private hostels, while 33.5% were using residential student housing, notably halls of residence on campus. The greater percentage of nonresidential students is a reflection of the existing situation in Ghana where majority of the tertiary students had to choose non-residential housing because of inadequate residential campus housing.

**4.2. Exploratory Factor Analysis.** In this study factor analysis was conducted using SPSS 16.0 for Windows. The results

TABLE 2: Exploratory factor analysis.

	Rotated component matrix <sup>a</sup>			
	Component			
	1	2	3	4
CF1	.220	<b>.808</b>	.098	-.054
CF2	.203	<b>.868</b>	.105	-.024
CF3	.309	<b>.814</b>	.110	.013
EF1	.570	.606	-.091	.044
EF2	.542	.571	-.065	.051
SF1	<b>.576</b>	.408	.161	.056
SF3	.052	.047	<b>.859</b>	-.012
SF4	.268	.128	<b>.759</b>	-.019
EF3	<b>.634</b>	.394	.128	.025
EF4	<b>.697</b>	.041	.239	.026
EF5	<b>.737</b>	.128	.194	-.125
EF6	<b>.747</b>	.185	.143	-.070
SF6	<b>.768</b>	.257	.062	-.020
SF7	<b>.637</b>	.303	.030	.058
OV1	<b>.662</b>	.274	.028	-.014
CS2	-.067	-.003	.102	<b>.808</b>
CS1	.027	-.004	-.129	<b>.799</b>

Kaiser-Meyer-Olkin measure = 0.893; Bartlett's test of sphericity tests ( $X^2$ : 2960.000, df: 105.000, Sig.: 0.000).

Principal component analysis and varimax with Kaiser normalization.

of the EFA (see Table 2) show a high value of 0.893 for the Kaiser-Meyer-Olkin measure and indicate the suitability of the research data for structure detection, that is, the proportion of variance in the items that might be caused by underlying factors. Thus, generally the data is useful for factor analysis. This is confirmed by the significance of Bartlett's test of sphericity tests ( $X^2$ : 2960.000, df: 105.000, Sig.: 0.000) indicating that the variables are not unrelated and therefore suitable for structure detection. However, the initial communalities test (Table 1) indicated that three items (OV2, SF2, and SF5) were not reliable since their values were below 0.5. Moreover, as shown in Table 2 two items (EF1 and EF2) had multiple factor loadings greater than 0.5 which is a violation of the criteria for factor selection. Therefore, four items of SHQ were eliminated because they did not satisfy the criteria set for factor loading selection; these are indicated with strikethrough. Fifteen items of SHQ were not affected at all while only four items were affected. In all, four factor components emerged.

**4.3. Regrouping of Items.** As shown in Table 2, components 2 and 4 have only core facility and cost items, respectively, while component/factor 1 contains a mixture of items other dimensions. These derived dimensions were then relabelled. The labels were intuitively chosen based on the meaning suggested within the context of housing industry. These are consistent with labelling and coding textual data [45] and the justifications for these labels are as follows.

TABLE 3: Confirmatory factor analysis of remaining 15 SHQ items.

	Rotated component matrix <sup>a</sup>			
	Component			
	1	2	3	4
CF1	.251	<b>.831</b>	.068	-.039
CF2	.249	<b>.885</b>	.067	-.010
CF3	.358	<b>.809</b>	.080	.023
SF1	<b>.604</b>	.356	.166	.052
SF3	.055	.053	<b>.864</b>	-.014
SF4	.278	.115	<b>.768</b>	-.023
EF3	<b>.651</b>	.352	.131	.022
EF4	<b>.689</b>	.039	.229	.027
EF5	<b>.738</b>	.119	.179	-.125
EF6	<b>.767</b>	.165	.116	-.069
SF6	<b>.791</b>	.214	.048	-.023
SF7	<b>.691</b>	.253	-.009	.057
OV1	<b>.712</b>	.263	-.039	-.007
CS2	.014	-.008	-.113	<b>.799</b>
CS1	-.048	-.003	.081	<b>.811</b>

Variance explained = 65.37%.

Principal component analysis and varimax with Kaiser normalization.

*Factor 1* is dominated by four enabling facility quality items, combined with two supporting facility items and overall housing quality. The enabling facilities are security facility (EF3), rule and regulations (EF4), interpersonal relationship (EF5), behaviour of owner (EF6). The supporting facility items are availability of transport (SF7) and reading room facility (SF1), and one overall quality of housing item (OV1). Since this group is dominated by enabling facility quality items, the appropriately label for it was *enabling facility quality*.

*Factor 2* contained only items from the original core facility dimension. These are bedroom facility (CF1), bathroom facility (CF2), and toilet facility (CF3). None of the original core facility items was eliminated, so it could be retained as *core facility quality* dimension.

*Factor 3* had only two items from the original supporting facility (SF) dimension. These are garage facility (SF3) and JCR/entertainment (SF4). Five of the supporting facility items were removed. Since the remaining two items are part of the conceptualised SF, this dimension was retained or labelled as *supporting facility*.

*Factor 4* contained the two items of cost dimension. These are accommodation fee (CS1) and searching cost (CS2). These two cost items basically relate to how affordable the housing fees paid by student are in terms of the rent and cost for searching for the housing which are charged by real estate agents for providing housing search services to some nonresidential students.

**4.4. Confirmatory Factor Analysis (CFA) on the Remaining 15 Items.** CFA on the remaining 21 items using PCA extraction method with varimax rotation was done to confirm the dimensionality of the derived instrument (Table 3). The CFA

TABLE 4: Labelling and reliability of derived dimensions.

Emerged dimensions	No. of items of SHQ	Reliability
Enabling facility quality	8	0.839*
Core facility quality	3	0.917*
Supporting facility quality	2	0.903*
Cost of accommodation	2	0.894*
Cronbach's alpha for all item	15	0.840
Variance extracted for all items	15	0.654

\* Estimates are composite reliability.

was run based on the procedure explained above. The total variance explained is 65.37, which means the underlying components derived explain about 65.37% of the SHQ construct. With factor loadings above 0.60, all the 15 SHQ items could be considered strong [44? ]. Thus, the results of the CFA in Table 3 provide strong evidence to confirm the derived dimensions of the EFA in Table 2.

**4.5. Validity and Reliability of Derived Instrument.** After CFA, the reliability and validity of the derived instrument must be assessed to provide strong support for the labelled or emerged dimensions or constructs [36, 47]. Instrument validity refers to whether the statistical instrument measures what it is intended to measure, that is, accuracy of measurement of content [36]. Content validity or sampling validity refers to whether a measurement instrument has adequate and representative coverage of the concepts in the variables being measured [36]. It is usually achieved by seeking opinion of other investigators or experts. Construct validity has to do with measuring an instrument to an overall theoretical framework in order to determine whether the device confirms a series of hypotheses derived from an existing theoretical framework. In this work, the questionnaire items for this study were based on the literature reviews and experts' review to ensure its content and construct validity. The survey instrument items were grounded in the framework for service components in previous work [10, 12, 32]. The two main aspects of construct validity, being, convergent validity, and discriminant validity, can be deduced from the CFA results [36]. Since the items converge strongly to the derived dimensions, good convergent validity is indicated in the "strong" factor loadings. Also discriminant validity can be deduced because the factor loadings indicate that the items do not overlap across different dimensions.

Reliability refers to whether a measurement instrument is able to yield consistent results each time it is applied [47]. Statistically, several useful methods are available in assessing the reliability of constructs in CFA. These measures are the summated scale (average of the factor loadings) for a component, Cronbach's alpha with acceptable value of 0.7 and above [47], composite reliability with acceptable value of 0.7, and average variance extracted (AVE) with acceptable value of 0.5 and above [47, pages 135–137]. The reliability results for composite reliability (CR) and AVE are presented in Table 4 for each derived dimension of SHQ. Taken together, the CR

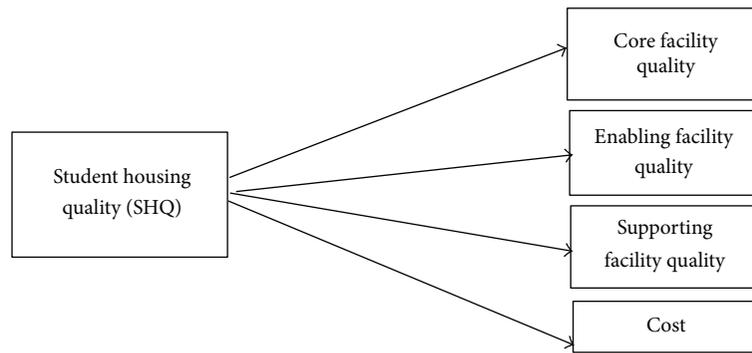


FIGURE 4: Derived SHQ dimensions.

values are above 0.80, the AVE is 65.4%, and Cronbach's alpha for all fifteen items is 0.840, thus indicating good reliability.

## 5. Discussion and Implications

The overarching objective of this paper was to determine housing quality in higher educational institutions. In many housing provision contexts, especially hospitality industry, the housing service quality criteria and dimensions that have been used extensively in evaluating service quality are based on SERVQUAL developed by Parasuraman et al. [13]. Very little attention has been given to the use of other alternative models of service components in evaluating housing quality, especially in the context of student housing in HIL in Sub-Saharan Africa. Given that higher education students have unique characteristics and that the effectiveness of their learning could be affected by the quality of housing facility quality they experience, it becomes critically important to further our understanding of quality concepts that are most relevant to housing services for students in higher institution of learning.

This paper attempts to fill this gap by drawing on core service, enabling service, supporting services, and other service components found in the existing housing and quality management literature [10, 12, 32], through CFA approach, to propose a framework of latent factors that are critical for understanding SHQ in higher education context. It contributes to the extant literature on SHQ evaluation and advances our knowledge of critical factors that describe and reflect student-tenants/quests' evaluation of housing quality, especially in the context of student housing in HIL in Sub-Saharan Africa. It also provides practitioners with a general framework as a guide for developing student driven housing facilities in HIL. Thus, the emerged dimensions of student housing quality in HIL, termed SHOQUAL, could serve as useful criteria and dimensions for student evaluation of housing quality especially in Sub-Saharan Africa context.

The results of the study show that, out of the five SHQ dimensions with twenty-item instrument developed for the study, four of the dimensions are confirmed to be relevant in the context of student housing in HIL in Sub-Saharan Africa. There are fifteen-item instrument in the four derived dimensions. Core facility, enabling facility, supporting facility, and cost dimensions in the originally conceptualised

SHQ dimensions found in literature were retained, even though some dimensions received some minor modifications through the FA. The four emerged dimensions with fifteen items are presented in Figure 4 and Table 5. The meaning and implications of derived dimensions and their corresponding measurement items are discussed as follows.

*Enabling Facility Quality.* This dimension represents factors such as security, rule and regulations, interpersonal relationship, behaviour of landlord/lady, availability of transport, reading room facility, and overall quality of a housing facility. It received relatively the least composite reliability (0.839). All these factors play an enabling role in student housing service delivery that meets the expectations of the student as a customer. Management of HIL needs to ensure that these enabling facility quality items are provided for developing appropriate and educationally valuable housing facilities for students in their institutions.

*Core Facility Quality.* This dimension represents the most basic housing quality factors that are perceived as relevant and important to students in HIL. They includes bedroom facility, bathroom facility, and toilet facility. It received relatively the strongest composite reliability (0.917). The implication of this dimension is that management needs to pay the most attention to ensure that core facility quality is up to the required industry standards in developing housing for students in HIL in Ghana.

*Supporting Facility.* This dimension refers to housing quality aspects that are considered by students in higher institution of learning as desirable value added services. These are a kind of support quality aspects that include garage facility, junior common room, and entertainment facilities. This dimension received relatively the second highest composite reliability (0.903). Management should ensure that these support facility items are provided to support the core facility in developing student housing in higher institutions.

*Financial Cost.* This dimension refers to all the monetary obligations that students must fulfil in order to acquire and use the housing facility effectively. They include searching cost, housing rent, or fees per period, among others. Together, these items received relatively the third highest composite

TABLE 5: Derived SHOQUAL scale.

Code dimension	Indicators	
CF1	Core facility quality	Bedroom facility
CF2		Bathroom facility
CF3		Toilet facility
SF3	Supporting facility quality	Garage facility
SF4		Junior common room (JCR)/entertainment hall
SF1	Enabling facility quality	Reading room facility
EF3		Security facility
EF4		The kind of rules and regulations governing the housing
EF5		The cordial interpersonal relationship among tenants/students at the hostel/campus housing.
EF6		The behaviour of the landlord/lady or officer-in-charge of the hostel/campus housing.
SF6		How the physical environment is pleasant and quiet for my study/learn.
SF7		Availability of transport from the hall/hostel/house to lecture/classes.
OV1	The overall impression of the quality of the housing to the student.	
CS2	Cost	How easy or difficult it was when you were searching for your hostel or hall of residence housing
CS1		How affordable housing fee is

reliability (0.894). Financial cost of student housing has been a major concern for students in many countries of the world. It is recommended that, since financial cost of acquiring and using student housing is critically important, management of higher institutions, especially in developing countries, should keep developing more effective strategies for partnering with donor agencies to sponsor students in higher institutions by paying for their housing cost. Moreover, management should develop strategic partnership with accredited agencies to help students in searching for housing in higher institutions. Management again should adopt innovative financing mechanisms such as public-private partnerships in the delivery of student housing in HIL. This has the tendency of reducing the cost of the core facility overtime and hence will reduce the financial cost to students at the long run.

## 6. Conclusion and Limitations

Over a decade, existing literature on service quality for hospitality, facility, and housing services in emerging economies context has very little empirical work in the area of housing quality for students in HIL. This study provides an empirical framework for understanding some dimensions of SHQ relevant to higher educational institution students. One major contribution of this paper is that it has validated a framework for understanding of SHQ dimensions, adding to the extant

literature on models of quality dimensions relevant to student housing in higher education environment.

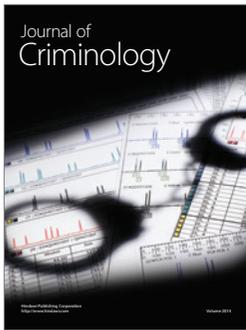
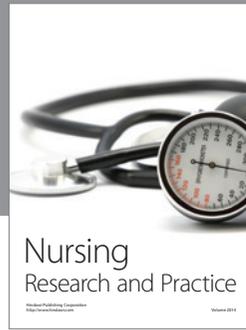
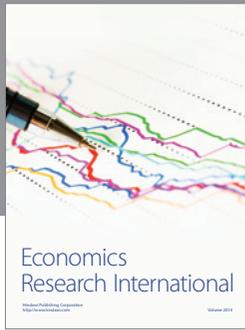
The study implies that within service quality dimensions relevant to student housing in higher education institutions, there are four underlying dimensions that could help explain the SHQ phenomenon. The four emerged dimensions with fifteen items could be used by management of student housing providers as critical factors in evaluating SHQ in HIL. It concludes that the SHOQUAL model, aside the popular SERVQUAL model, could be useful in determining SHQ dimensions relevant to HIL.

It is cautioned that the results of the present study should be interpreted within the context of Sub-Sahara Africa, especially Ghanaian tertiary institutions, and similar studies should be done in similar contexts in different countries to compare the results before generalisations could be made. Finally, the items of each dimension identified for SHOQUAL applicable to HIL are not exhaustive. Different country-specific contexts may require modifications to the SHOQUAL; the expansion of items could be grouped under each dimension as well as the inclusion of additional dimensions as knowledge keeps evolving and existing policies and practices keep changing. Therefore, future research should explore other critical factors in both HIL context in different developed and emerging countries for a better understanding of student housing quality dimensions relevant to HIL.

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