Modeling Satisfaction Factors that Predict Students Choice of Private Hostels in a Ghanaian Polytechnic

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Authors' contributions

This work was carried out in collaboration between all authors. Author FM designed the study, wrote the protocol and supervised the work. Authors PANB, AWS and JT carried out the statistical analysis. All authors read and approved the final manuscript.

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Abstract

The objective of this research was to examine how satisfied students are with the facilities and services provided by private hostels and identify the satisfaction factors that predict student's choice of a hostel. A descriptive, cross-sectional survey was conducted among 350 purposively selected students staying in private hostels in Ho Polytechnic, Ghana. Logistic regression analysis was used to identify the predictors of the satisfaction factors. Results show that five factors "X2 (Security issues of the hostel)", "X4 (Availability of water facilities)", "X5 (Availability of electricity)", "X6 (Calm and peaceful environment)" and "X15 (Availability of toilet facilities)" were statistically significant in the prediction of students' satisfaction with hostel facilities and services with a predicted satisfaction rate of 98.03%. It is therefore recommended that there is a need for private developers to be engaged in a partnership scheme with the school management to construct more hostels on campus with current state of the art facilities which will meet the needs of the growing population of the students. Also, to attract students, management and developers of a hostel should provide an affordable hostel within a calm and peaceful environment with high level of security and availability of water, toilet and electricity facilities.

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DEFINITION OF VARIABLES

X1   :   Proximity to lecture halls
X2   :   Security issues of the hostel
X3   :   Affordable accommodation fee
X4   :   Availability of water facilities
X5   :   Availability of electricity
X6   :   Calm and peaceful environment
X7   :   Availability of study area
X8   :   Proper ventilation system
X9   :   Availability of a cafeteria
X10 :   Availability of toilet facilities
X11 :   Availability of recreational facilities
X12 :   Number of person in a room (Level of privacy)
X13 :   Availability of waste disposal facilities

1 Introduction

Sifuna [1], observes that the social demand for higher education is quite high. This has been brought about by the external efficiency that results from higher education. The increased demand for higher education has seen rapid expansion of polytechnic facilities so as to improve access.

In recent years, Ho Polytechnic has experienced phenomenal growth in student numbers which has consequently resulted in high demand for accommodation. Physical planning in the polytechnic has not matched the rate of growth and expansion. The Polytechnic has started running halls of residence on a commercial basis where students pay polytechnic accommodation or look for alternative accommodation.

Students are made to know well in advance that room application is not a guarantee for room allocation. The Polytechnic Private Hostels Coordinating Unit tries to link students who do not get accommodation in the Polytechnic Halls to some private hostels who are registered with the institution. The number of students seeking private accommodation in Ho polytechnic as at 2015 was approximately 1,509.

Although studies have been done to investigate factors influencing residents' satisfaction with their homes and neighbourhood, there seem to be a lack of inquiry into students' satisfaction with their hostel facilities, Amole, [2]. In studies that place the critical lens on students' satisfaction levels of their university accommodation, the units of focus have been diverse such as on the influence of the physical attributes, psychological and management aspects. Most of these studies indicate that there is a direct correlation between the satisfaction levels and the hostel environment. Basically, when the environment meets the individuals' expectation a higher degree of satisfaction has been noted. On the other hand, incongruence between housing needs and aspirations leads to dissatisfaction Mohit et al. [3]. Thus, it can be concluded that understanding students' satisfaction predicting factors can assist tertiary institutions to undertake changes to increase satisfaction among them.

However, the gap for this study is situated on the fact that there is no clear work referencing the students' satisfaction factors that predict choice of hostels in Ghana. Thus this study is aimed towards the development of a better understanding of factors that predict choice of hostels in Ho Polytechnic. Specifically, to establish how satisfied students are with the facilities and services provided by private hostels and determine the factors that predict these satisfactions with hostel facilities and services in Ho Polytechnic.

2 Literature

2.1 The concept of customer satisfaction

Gustafsson et al. [4], defined customer satisfaction as a customer's overall evaluation of the performance of an offering to date. This overall satisfaction has a strong positive effect on customer loyalty intentions across a wide range of product and service categories. The satisfaction judgment is related to all the experiences made with a certain business concerning its given products, the sales process, and the after-sale service. Whether the customer is satisfied after purchase also depends on the offer's performance in relation to the customer's expectation. Customers form their expectation from past buying experiences, friends' and associates' advice, and marketers' and competitors' information and promises, Kotler, [5].

In view of Ree et al. [6], customer satisfaction is the degree to which a customer perceives that an individual, firm or organization has effectively provided a product or service that meets the customer's needs in the context in which the customer is aware of and or using the product or service. Satisfaction is not inherent in the individual or the product but is a socially constructed response to the relationship between a customer, the product and the product provider or maker. To the extent that a provider or maker can influence the various dimensions of the relationship, the provider can influence customer satisfaction.

Customer satisfaction is a key factor in the success of any company and is produced when customers' needs have been met and they have derived profit or value from their experience. Also, customer satisfaction brings about new experiences to the customers whose needs have been fulfilled and satisfied. According to Becker et al. [7], customer satisfaction implies an extended relationship through activities such as selling, increasing revenue of the customers, and generating customer maintenance. Mithas et al. [8], mention that customer satisfaction is a factor that directly or indirectly impacts on a company and society. Companies must perform well, adhere to social contracts and show mutual understanding. Customer satisfaction may have an impact either positively or negatively on customer feedback. More satisfaction creates security and decreases loss of clients.

Flint et al. [9], also state that customer satisfaction creates positive word of mouth advertising, attracts more customers to the company, and retains existing customers. Moreover, customer satisfaction creates loyalty as a direct effect. Satisfaction or service quality has been described as an outcome of customers' expectations based on their comparison and perceptions about goods and services and also how the final result transfers to the customers and to what extent it makes them happier Cauruana [10]. Using customer satisfaction, the company can create new relationship circles using its customers and its partners. Furthermore, this characteristic will make the company more reliable.

Mittal et al. [11] have exhibited customer satisfaction to be influencing the factors that signify customer loyalty or in other words, the long-term orientation of a relationship. Furthermore, Geyskens et al. [12] considered customer satisfaction as an essential factor responsible for the long-term association between suppliers and buyers. It has often been enunciated that the affect component of satisfaction could stimulate a satisfied customer to patronize the service provider as well as referring its services to others. The positive effect of customer satisfaction on these dimensions of loyalty has been repeatedly voiced in the literature.

2.2 Problems with students place of residence

Handler [13] observes that "every society is faced with the problem of producing human habitation in sufficient quantity, and obtaining the kind of quality desired, at prices that individuals and families can afford". Based apparently on this definition that can be described as a working definition of the ideal residential housing, Handler further indicated that "the problem of housing exists in countries throughout the world". All over the world accommodation hunt is never a thing of the past. There have been stories about freaky flat mate and funny smells. While these are largely urban legends, there are still some shocking and soul comforting student accommodations out there. Ubong [14], had observed that, hostel accommodation

has not been receiving adequate attention, although it is an important component of pupil personnel management. Residential accommodation available to students is often priced high. For instance, the accommodation fee of Acolatse –Vodzi hall of Ho Polytechnic as at the 2014/2015 academic year was GHC540.00. In 2015/2016 academic year, the accommodation fee increased to GHC630.00 forcing most residents to vacate the hall.

Maintenance at the hall of residence for students is unfortunately poor; the institution has over the years, not been able to keep the hostels in proper residential conditions because of paucity of funds. Akpan [15], declares, "the student population is rapidly increasing, while the infrastructural amenities are declining in supply and their stock depreciating hostel facilities are in deplorable states and are overcrowded".

2.3 Perception of private accommodation providers

A study by Reed [6], on the economics of private hostels in Ghana; A case of private hostels on Kumasi Polytechnic campus, investigated the dynamics and benefits of private sector involvement in residential facilities for non-residential students of Kumasi Polytechnic by looking at a financial analysis and social implications of these privately owned hostels and assessed their relationships with major stakeholders. Although the research found that some proprietors of the facilities were termed as "unscrupulous landlords" charging exorbitant rents and exploiting the students, they disputed these allegations and claimed they were not even breaking even with the hostels. The proprietors claimed that some students had immoral behaviour and were like "flocks of sheep without a shepherd" and hence very vulnerable. This study looked at the satisfaction factors of private hostels by Ho Polytechnic students since very limited research on the subject has been done.

Agbenyegah et al. [10], research on residents' perception of off-campus students housing performance in Legon, Ghana was an empirical case study. The purpose of the study was to survey the residential satisfaction of the off- campus students housing in Legon. The study found that residential satisfaction was based on the levels of facilities provided. However, students highlighted that good road facility, car packs, adequate ventilation, crowding and sanitary condition together with delay in responses to maintenance demands as constraints in their hostels. Even though perceptions of private hostels owners of Polytechnic students and management may be important, very few studies have examined these.

3 Methods and Analytical Tools

The study employed descriptive, cross-sectional survey design. The setting was the Ho Polytechnic in Volta Region, Ghana. The target population was the students staying in private hostel. A total sample of 350 was taken from the target population. The study employed a non-probabilistic sampling technique, precisely purposive sampling. This sampling technique was used because there is no define structure of students staying in private hostel; hence there is no sampling frame for the population of interest. The study area is constituted by different locations within the study area. These locations of the hostel were considered as strata in the population and respondents were selected purposively. Data for the study was obtained by the administration of a questionnaire. The questionnaire had two sections. The first section consisted of demographic information such as age, and marital status of respondents. The second section dealt with satisfaction factors that predict a student choice of a hostel.

The study makes use of the logistic regression model. Logistic regression is based on binomial probability theory. It is a mathematical modelling approach used in describing the relationship of several independent variables to a dichotomous dependent variable or a limited dependent variable. Binary Logistic regression is a prognostic model that is fitted where there is a dichotomous/binary dependent variable like in this instance where the researcher is interested in whether a student is satisfied, or not. Usually, the categories are coded as "0" and "1" as it results is a straightforward interpretation. Normally the category of interest also affectionately referred to the case is typically coded as "1" and the other group is also known as a "non-case"

as "0". In this work, student satisfaction, "case", will be denoted by 1 and if a student is dissatisfied "non-case" will be denoted by 0.

According to Harrell (2001), the formula for a logistic regression model is given by;

$$\pi(x_i) = P(y_i = 1 : x_i)$$

$$= [1 + \exp(-X^T\beta)]^{-1}$$

$$where, y_i = \begin{cases} 1, if\ a\ student\ is\ satisfied \\ 0, if\ a\ student\ is\ not\ satisfied \end{cases} i = 1,2,\dots,n$$

$$X^T\beta = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_{p-1} x_{p-1}$$

$$\beta_{pX1} = \begin{bmatrix} \beta_0 \\ \beta_1 \\ \vdots \\ \cdot \\ \beta_{p-1} \end{bmatrix}, \quad X_{pX1} = \begin{bmatrix} 1 \\ X_1 \\ \vdots \\ \cdot \\ X_{p-1} \end{bmatrix}, \quad X_{ipX1} = \begin{bmatrix} 1 \\ X_{i1} \\ \vdots \\ \cdot \\ X_{i,p-1} \end{bmatrix}$$

$where\ x_1, x_2, \dots, x_k$ are independent variables

β_0 is the coefficient of the constant terms

$\beta_1, \beta_2, \dots, \beta_{p-1}$ are the coefficient of p independent variables

$\pi(x_i)$ is the probability of an event that depends on $p-$ independent variables

Since $\pi(x_i) = [1 + \exp(-X^T\beta)]^{-1}$

$$= \frac{1}{1 + \exp(-X^T\beta)}$$

$$\Rightarrow 1 - \pi(x_i) = \frac{1}{1 + \exp(-X\beta)}$$

$$= \frac{[1 + \exp(-X^T\beta)] - 1}{1 + \exp(-X^T\beta)}$$

$$= \frac{\exp(-X^T\beta)}{1 + \exp(-X^T\beta)}$$

$$\Rightarrow \frac{\pi(x_i)}{1 - \pi(x_i)} = [\exp(-X^T\beta)]^{-1}$$

$$Thus, \ln\left(\frac{\pi(x_i)}{1 - \pi(x_i)}\right) = logit[\pi(x_i)]$$

$$= X^T\beta$$

Furthermore, Kutner et al. (2005) stated that since the dependent variable is dependent and can take values 1 and 0 with probabilities $\pi(x_i)$ and $1 - \pi(x_i)$ respectively, Y follows a Bernoulli distribution with $(Y) = \pi(x_i)$.

$$\text{Thus}, Y_i = \pi(x_i) + \varepsilon_i$$

$$E(Y_i) = \pi(x_i)$$

$$= [1 + \exp(-X^T\beta)]^{-1}$$

$$= \frac{1}{1 + \exp(-X^T\beta)}$$

$$P(Y_i = 1) = \pi(x_i)$$

$$P(Y_i = 0) = 1 - \pi(x_i)$$

The probability density function can be presented as

$$f_i(Y_i) = \pi(x_i)^{Y_i}[1 - \pi(x_i)]^{1-Y_i}, \qquad \text{for } Y_i = 0,1,2,\dots,n$$

The Y_i's are assumed to be independent and thus, the joint probability function is given by

$$g(Y_1, \dots, Y_n) = l(\beta) = \prod_{i=1}^{n} f_1(Y_i)$$

$$= \prod_{i=1}^{n} \pi(x_i)^{Y_i}[1 - \pi(x_i)]^{1-Y_i}$$

where β is a vector of unknown parameters.

4 Results and Analysis

A total of 350 students staying in the private hostel completed the questionnaire on satisfaction factors that predict student's choice of hostel. Table 1 summarizes the socio-demographic information of the respondents. From the Table 1, 172 of the respondents representing 49.1% were males whereas 178 representing 50.9% were females; in which majority of people who responded to this questionnaire are between 18 and 25, followed by 26 and 35. This means that close to 83.7% (52.6 + 31.1) of the time, views leading to conclusions drawn from this research could be attributed largely to students of that age group. The analysis further indicated that out of the total 350 respondents, majority of them which represent 76% were single whiles the rest 24% were married.

Fig. 1 shows how satisfied students are with the facilities and services provided by the hostel in which about 53 of the respondents indicated that they are highly satisfied, 123 were satisfied, 43 were neutral, 101 were dissatisfied and finally, 30 of them were highly dissatisfied.

Table 2 gives the information about the contribution or importance of each predictor variables. The test that is used here is known as the Wald test and the test statistic for each predictor variable is shown in the column labelled Wald. The significance of the Wald statistic for each independent variable indicates the overall factors predicting students' satisfaction with hostel facilities and services (*P<0.05*). The significance of the variables is assessed by the p-value (represented in the table by "sig."), the Wald's statistic value or the odd ratios represented by $Exp(\beta)$.
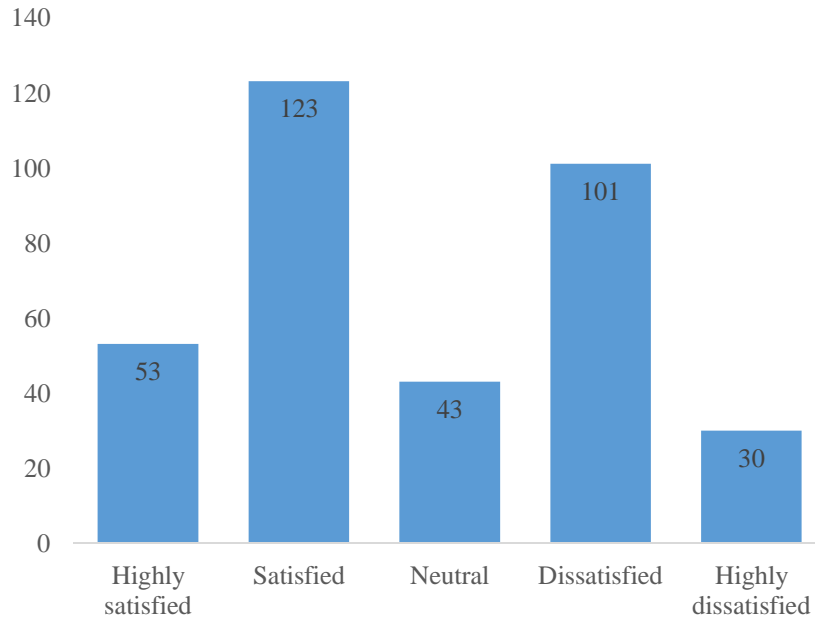
Fig. 1. Respondents satisfaction with hostel facilities and services

Table 1. Demographic information of the participants (n=350)

Variables	Frequency	Percentage
Gender		
Male	172	49.1
Female	178	50.9
Age		
18-25	184	52.6
26-35	109	31.1
36-45	45	12.9
46-56	12	3.4
Marital status		
Never married	266	76.0
Married	84	24.0

Source: Field data, 2016

From the table, the Wald statistics and the significance level shows that 5 out of the 13 independent variables namely; *"X2 (Security issues of the hostel)", "X4 (Availability of water facilities)", "X5 (Availability of electricity)", "X6 (Calm and peaceful environment)" and "X15 (Availability of toilet facilities)"* were significant to the prediction of satisfaction with hostel facilities and services. This is because they had p-values of less than 0.05 (sig. in Table 2).

Thus the logistic function is given by the equation below:

$$In\frac{\pi(x_i)}{1-\pi(x_i)}5.033 - 0.737X2 + 0.755X4 - 0.845X5 - 0.980X6 + 0.683X10$$

Where X2 is Security issues of the hostel, *X4* is Availability of water facilities, *X5* is Availability of electricity, *X6* is Calm and peaceful environment *and X15* is Availability of toilet facilities.

Table 2. Logistic regression estimates of factors that predict student's satisfaction with hostel facilities and service

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	**Upper**
X1	-0.037	0.255	0.021	1	0.886	0.964	0.584	1.590
X2	**-0.737**	0.211	12.247	1	**0.000**	**0.479**	0.570	1.108
X3	-0.230	0.169	1.838	1	0.175	0.479	0.317	0.723
X4	**0.755**	0.258	8.542	1	**0.003**	**2.128**	1.282	3.531
X5	**-0.845**	0.197	18.348	1	**0.000**	**0.430**	0.292	0.632
X6	**-0.980**	0.255	14.735	1	**0.000**	**2.665**	1.616	4.396
X7	-0.107	0.205	0.274	1	0.600	1.981	1.093	3.588
X8	0.386	0.356	1.177	1	0.278	1.471	0.732	2.955
X9	-0.049	0.264	0.035	1	0.852	0.952	0.567	1.598
X10	**0.683**	0.303	5.083	1	**0.024**	**0.898**	0.601	1.342
X11	-0.473	0.333	2.021	1	0.155	0.623	0.324	1.196
X12	-0.058	0.241	0.058	1	0.809	0.943	0.588	1.514
X13	0.108	0.239	0.204	1	0.652	1.114	0.698	1.777
Constant	5.033	2.499	4.055	1	0.044	0.007		

Source: Field data, 2016

Furthermore, the odd ratio ($Exp(\beta)$) for the significant factors, shows the increase (or decrease if the ratio is less than one) in odds of being in one outcome category (satisfied or not satisfied) when the value of the predictor increases by one unit. From Table 2, the odds or risk of a student being satisfied, is 0.479 for *X2 (Security issues of the hostel)*. This indicates that, the risk of a student being satisfied is 0.479 times higher for a student who perceived a hostel to be highly secured, all other factors being equal. For *X4 (Availability of water facilities)*, the odd ratio of 2.128 indicates that risk of a student having satisfaction with a hostel having water facilities, is 2.128 times more likely to derived satisfaction as compared with those not having water facilities, all other factors being equal. For *X5 (Availability of electricity)*, the odd ratio of 0.430 indicates that the risk of a student deriving satisfaction is 0.430 times higher for a student who has availability of electricity in their hostel than for a student who does not have access to electricity in their hostel, all other factors being equal.

Furthermore, for *X6 (Calm and peaceful environment)*, the odd ratio of 2.665 indicated that the risk of a student deriving satisfaction is 2.665 times higher for a student who has a calm and peaceful environment in their hostel, all other factors being equal. Finally, the odd ratio of 0.898 for *X15 (Availability of toilet facilities)* indicates that, for any hostel with toilet facilities, the risk of getting satisfaction increases by a factor of 0.898, all other factors being equal.

The next output table seeks to rank five (5) attributes that influence students' most based on their choice of a hostel. The attributes were ranked by students on a scale of 1 – 5, with 1 being the least important and 5 the most important. The order in which students ranked the attributes came out as shown in Table 3. (Note: Mean importance is calculated with the values of 1 for least important and 5 for most important. Hence, a higher mean indicates a greater importance).

Table 3 shows the various mean ranks of respondents on the factors that influence their choice of a hostel the most. It can be seen that "accommodation charges" recorded the highest mean, followed by "security issues"; "availability of water and electricity"; "proximity to lecture halls" and "level of privacy" in that order.

The next output table shows whether or not students differentiate between these various hostel choice attributes.

Table 3. Relative importance rankings by students for hostel choice attribute

	Mean rank
Security issues	3.15
Availability of water and electricity	3.07
Level of privacy	2.66
Proximity to lecture halls	2.73
Accommodation charges	3.39

Source: Field data, 2016

Table 4. Kendall's co-efficient of concordance for hostel choice attribute

Test statistics	
Kendall's W	0.040
Chi-square	55.329
Df	4
Asymp. significance	0.000

Source: Field data, 2016

The Kendall's Co-efficient of Concordance (W) for the rankings of hostel choice attributes as shown in table 4 above is 0.040. This means that the degree of agreement on a zero to one scale is 0.040. The degree of unanimity as measured by the W-statistics is about 4% since the score is zero for random ranking and 1 for perfectly unanimous ranking. Thus, to a large extent, there is agreement among respondents with regards to the rankings provided. The asymptotic distribution gave a significance level value of 0.000, which is less than 0.05. Thus, the null hypothesis (the rankings disagree) is rejected and the alternative hypothesis (the rankings agree) is accepted.

Thus students in the study area can therefore, be said to generally agree that the most important attributes of hostel choice are more related first to accommodation charges, secondly to security issues, followed by availability of water and electricity, proximity to lecture halls, with level of privacy been the least important attribute.

5 Conclusion and Recommendation

Concerning how satisfied students are with the facilities and services of a hostel, about 53 of the respondents indicated that they are highly satisfied, 123 were satisfied, 43 were neutral, whiles 101 were dissatisfied and finally, 30 of them were highly dissatisfied.

Furthermore, the study revealed that five (5) factors; *"X2 (Security issues of the hostel)", "X4 (Availability of water facilities)", "X5 (Availability of electricity)", "X6 (Calm and peaceful environment)" and "X15 (Availability of toilet facilities)"* were statistically significant in the prediction of students' satisfaction with hostel facilities and services with a predicted satisfaction rate of 98.03%. This indicates that there is a probability that 98.03% of students will be satisfied with hostel facilities and services based on the given characteristics, all other things being equal.

Finally, students in the study area generally agree that the most important attributes of hostel choice are more related first to accommodation charges, secondly to security issues, followed by availability of water and electricity, proximity to lecture halls, with level of privacy being the least important attribute.

It is therefore recommended that there is a need for private developers to be engaged in a partnership scheme with the school management to construct more hostels on campus with current state of the art facilities which will meet the needs of the growing population of the students. Also, to attract students, management

and developers of a hostel should provide an affordable hostel within a calm and peaceful environment with high level of security and availability of water, toilet and electricity facilities.

Finally, potential stakeholders in the design, construction and management of hostel facilities should consider factors such as accommodation charges, secondly security issues, followed by availability of water and electricity, and proximity to lecture halls when putting up a hostel in order to attract students.

Competing Interests

Authors have declared that no competing interests exist.

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