DEVELOPMENT OF A POST-OCCUPANCY EVALUATION TOOLKIT FOR STUDENT HOSTELS

BY

ENE MARGARET ONU (B.Sc Building)
M.Sc/ENV-DESIGN/1927/2011-2012

DEPARTMENT OF BUILDING,
AHMADU BELLO UNIVERSITY, ZARIA,
NIGERIA

DEVELOPMENT OF A POST-OCCUPANCY EVALUATION TOOLKIT FOR STUDENT HOSTEL

BY

Ene Margaret ONU (B.Sc Building) 2010
M.Sc/ENV-DESIGN/1927/2011-2012

A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA

IN PARTIAL FULFILLMENT FOR THE AWARD

OF A MASTERS DEGREE IN CONSTRUCTION MANAGEMENT

DEPARTMENT OF BUILDING,

FACULTY OF ENVIRONMENTAL DESIGN

AHMADU BELLO UNIVERSITY, ZARIA NIGERIA.

APRIL, 2015

DECLARATION

I declare that the work in the thesis entitled **DEVELOPMENT OF A POST OCCUPANCY EVALUATION TOOLKIT FOR STUDENT HOSTELS** has been carried out by me in the Department of **BUILDING.** The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at any University

_____	_____	_____
Name of Student	Signature	Date

CERTIFICATION

This thesis entitled **DEVELOPMENT OF A POST-OCCUPANCY EVALUATION TOOLKIT FOR STUDENT HOSTELS** by Ene Margaret ONU meets the regulations governing the award of the degree of **Master of Science (Construction Management)** of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

(Chairman, Supervisory Committee) Dr. Y.M. Ibrahim	(Signature)	(Date)
(Member, Supervisory Committee) Dr. A.M. Stanley	(Signature)	(Date)
(Head of Department) Dr. Dikko Kado	(Signature)	(Date)
(Dean, School of Postgraduate Studies) Prof Zoaka A. Hassan	(Signature)	(Date)

ACKNOWLEDGEMENT

I wish to acknowledge everyone that contributed to the success of this work. First and foremost, I am deeply grateful to my supervisors in the persons of Dr Y. M. Ibrahim and Dr A.M. Stanley for their guidance and contributions.

I also want to appreciate Dr A.D. Ibrahim, Prof I. Mbamalli, Mr. Muawiya and Mr. A. Dania whose feedbacks and comments also enriched this research.

Thanks also to my examiners for their helpful comments and insights.

Many thanks to the entire staff of the Department of Building A.B.U, Zaria for the platform and enabling environment provided, I appreciate your immense contribution.

I would also like to appreciate the management and hostel staff of Queen Amina, Ribadu and Alexander Halls for their utmost cooperation and insight provided during the course of the field work.

Many thanks also go to the security personnel for their committed distribution of questionnaires to the visitors.

To my research assistants; Lona, odachi and Promise whose dedication benefited greatly to this study

I am grateful to my colleagues and friends for their moral support. All my friends are appreciated for their support especially Emmanuel Nkeleme, Olurotimi Ekundayo and Abdulhafeez Ibrahim who contributed in diverse ways to the success of this research.

I owe very special thanks to my entire family for their kindness and support during the study. I am particularly indebted to my parents, and my in-laws, for their love, prayers, support and encouragement.

Most of all, a heartfelt appreciation goes to my wonderful husband David for his support encouragement, patience and love throughout this study.

DEDICATION

To the almighty God from Whom all blessings flow, I owe all I am to Your Mercy. To my Husband, Best friend, greatest encourager and biggest fan David Ekoja Ejeh I am greatly favoured.

ABSTRACT

The culture of assessing the quality and performance of buildings greatly increased in recent years and have become widely practiced in developed countries. In that regard several Post-occupancy protocols and toolkits have been developed for different building types and purposes. However these Post-occupancy toolkits cannot be fully utilised in developing countries. Instead the question arises about global similarities and differences, especially in building users' attitudes and preferences. With these in mind this research sought to develop a Post-occupancy toolkit for evaluating student hostels specific to the Nigerian Environment by answering the research question, 'How can all user groups be included in the evaluation of on-campus student housing facility in Nigeria?' The method involved observation of the activities and interactions within the student hostels and interviews of both students and staff. This process produced themes that were validated using structured questionnaires. The results of the questionnaires based on users feedback produced key areas (strategic value and functional performance requirements) the developed Post-occupancy toolkit addressed. Findings from the questionnaire show that all user groups considered security as the most important student need in the hostel facility in Nigeria. Furthermore the research established that, the room as a design space according to all users is the most important space in the design of a hostel facility. The research concluded by developing a Post-occupancy Evaluation toolkit solely based on the feedback of the user groups on what was considered most relevant in the student on-campus housing and which captures all stakeholder opinion in evaluation of hostel facilities. The research recommends that security be given topmost priority in the design of hostel facilities in Nigeria. In addition, functional requirements such as adequacy of space, environmental quality, aesthetic appeal, routine maintenance, privacy, serenity, comfort, health and safety, population density, handicapped accessibility should be considered in the design of all spaces in the hostel facility. Finally the research recommends that the management of Ahmadu Bello University and similar institutions in Nigeria through design, should ensure that the hostel facilities create an environment where academic performance, fostering mutual interest, intellectual stimulation, inspiration, institutional loyalty, cooperation, contact with others, unity and character development needs of the student are met.

TABLE OF CONTENTS

TITLE PAGE ..... **i**
DECLARATION ..... **ii**
CERTIFICATION ..... **iii**
ACKNOWLEDGEMENT ..... **iv**
DEDICATION ..... **v**
ABSTRACT ..... **vi**
TABLE OF CONTENTS ..... **vii**
LIST OF TABLES ..... **x**
LIST OF FIGURES ..... **xii**
LIST OF APPENDICES ..... **xiii**
ABBREVIATIONS ..... **xiv**
1.0 INTRODUCTION **1**
1.1 Background of the Study **1**
1.2 Statement of the Research Problem **4**
1.3 Justification of the Study **5**
1.4 Aim and Objectives. **7**
1.4.1 Aim 7
1.4.2 Objectives 7
1.5 Methodology **7**
1.5.1 Sample size 8
1.5.2 Data collection technique 10
1.5.3 Data analysis 11
1.6 Scope And Delimitations **11**
1.6.1 Scope 11
1.6.2 Limitations 11
2.0 LITERATURE REVIEW **12**
2.1 Origin and History Of Post-Occupancy Evaluation **12**
2.2 Concepts of POE **13**
2.2.1 Levels of conducting POE 15
2.2.2 Benefits of POE 16
2.3 Drivers and Inhibitors of the POE Process **17**
2.4 The Construction Industry, Construction Management and POE **20**
2.5 Application of POE in Advanced/ Developed Countries **24**

2.5.1 POE in the UK 24
2.5.2 POE in Brazil 26
2.5.3 POE in America 27
2.6 POE in Developing Countries 27
2.6.1 POE in Malaysia 27
2.6.2 POE in Nigeria 28
2.7 POE and Student Housing Facilities 29
2.8 Educational Facilities Ergonomics 30
2.8.1 Performance levels: a hierarchy of users' needs and priorities 31
2.8.2 Housing facilities and its effect on student learning and development 33
2.9 POE Protocols 34
2.9.1 BREEM 34
2.9.2 AUDE 34
2.9.3 Survey by the center for the built environment (CBE) 37
2.9.4 Post-Occupancy Review of Buildings and their Engineering (PROBE) 37
2.10 The Nigerian Academic Environment 40
2.11 Summary of Review 42
3.0 RESEARCH METHODOLOGY 43
3.1 Research Design 43
3.1.1 Rationale for the methodology/philosophical backing for research 43
3.2. Research Methods 45
3.3 Desk Research/ Literature Review 46
3.4 Field Survey 46
3.4.1 Study area 46
3.4.2 Sample population 47
3.4.3 Sample size 48
3.5 Data Collection Techniques 50
3.6 Analysis of Case Study Data 53
3.7 Developing of the Post Occupancy Evaluation toolkit 55
3.7.1 Stakeholders / diversity of voices 55
4.0 DATA ANALYSIS, PRESENTATION AND DISCUSSION 57
4.1 Preamble 57
4.2 Responses of Students 58

4.2.1 Physical challenge of student respondents....58
4.2.2 School ethos/strategic value....59
4.2.3 Functional performance requirements....60
4.3 Responses of Hostel Management Staff....69
4.3.1 School ethos/strategic value....69
4.3.2 Functional performance requirement....70
4.4 Responses of Visitors....74
4.4.1 School ethos/strategic value....75
4.4.2 Functional performance....76
4.5 Observation and Interviews....84
5.0 SUMMARY OF FINDINGS, CONCLUSIONS, RECOMMENDATIONS....92
5.1 Summary of Findings....92
5.2 Conclusions....93
5.3 Recommendations....94
5.4 Recommendations for Further Study....95
REFERENCES....97
APPENDIX I....104
APPENDIX II....105
APPENDIX III....111
APPENDIX IV....117
APPENDIX V....119
APPENDIX VI....129

LIST OF TABLES

Table **Page**

Table2.1: Perceived barriers to POE. 18
Table4.2; Frequency of student Respondents at different Levels 58
Table4.3; Profile of physically challenged Students 58
Table4.4; Nature of Disability of Physically challenged students 59
Table5.4; School Ethos/Strategic Value and student Needs 59
Table4.6; Relevance of Adequacy of Space in Hostel Facilities 60
Table4.7; Relevance of Environmental Quality in Hostel Facilities 61
Table4.8; Relevance of Aesthetic Appeal in Hostel Facilities 61
Table4.9; Relevance of Routine Maintenance in Hostel Facilities 62
Table4.10; Relevance of Privacy in Hostel Facilities 62
Table4.11; Relevance of Serenity in Hostel facilities 63
Table4.12; Relevance of Comfort in Hostel Facilities 63
Table4.13; Relevance of Health and safety in Hostel Facilities 64
Table4.14; Relevance of Population density in Hostel Facilities 64
Table4.15 ; Relevance of Handicapped Accessibility in Hostel Facilities 65
Table4.16; Relevance of other Design Factors 66
Table4.17; Relevance of Extra facilities in the Hostel 67
Table4.18; Relevance of Support Facilities in the Hostel 67
Table4.19; Relevance of some Miscellaneous Design Considerations 68
Table4.20; Frequency of Hostel Management Staff Respondents 69
Table4.21; Frequency of Management Staff Response on Strategic Value and Student Needs 70
Table4.22; Functional requirements in Hostel Facility 71
Table4.23; Relevance of Miscellaneous Considerations in Hostel Facilities 72
Table4.24; Relevance of Extra Services in Hostel Facility 73
Table4.25; Relevance of Support Facilities in Hostel Facilities 73
Table4.26; Profile of Visitors User group 74
Table4.27; Visitors Response on the Relevance of Hostel facility to student Needs 75
Table4.28; Visitors Response on the Relevance of Adequacy of Space in Hostel facility 76
Table4.29; Visitors Response on the Relevance of Environmental Quality in Hostel Facility 76
Table4.30; Visitors Response on the Relevance of Aesthetic Appeal in Hostel Facility 77
Table4.31; Visitors Response on the Relevance of Routine Maintenance in Hostel Facility . 78
Table4.32; Visitors Response on the Relevance of Privacy in Hostel Facility 78
Table4.33; Visitors Response on the Relevance of Serenity in Hostel Facility 79
Table4.34; Visitors Response on the Relevance of Comfort in Hostel Facility 79
Table4.35; Visitors Response on the Relevance of Health and Safety in Hostel Facility 80
Table4.36; Visitors Response on the Relevance of Population Density in Hostel Facility 80
Table4.37; Visitors Response on the Relevance of Handicapped Accessibility in Hostel Facility 81
Table4.38; Visitors Response on the Relevance of other Design Factors in Hostel Facility .. 82

Table4.39; Visitors Response on the Relevance of Extra Facilities in Hostels 83
Table4.40; Visitors Response on the Relevance of Support Facilities in Hostels 83
Table4.41; Visitors Response on the Relevance of some Miscellaneous Design Considerations.....84

LIST OF FIGURES

Figure 2.1; Post-occupancy Evaluation process Model. 15
Figure 2.2; Levels of evolving performance criteria ..... **Error! Bookmark not defined.**
Figure 2.3; inter-relationships between buildings, occupants and occupants needs 32
Figure 2.4; Selection Chart for carrying out POE..... **Error! Bookmark not defined.**
Figure 2.5; Outline of the process used in Probe 1 39

LIST OF APPENDICES

APPENDIX I: Letter of Introduction

APPENDIX II: Post-Occupancy Toolkit for Student Hostels

APPENDIX III: Questionnaire addressed to Students

APPENDIX IV: Questionnaire addressed to Visitors

APPENDIX V: Questionnaire addressed to Hostel Management Staff

APPENDIX VI: Observation Sheet

ABBREVIATIONS

AUDE: Association of University Directors of Estate

BCON: British Council Organisation of Nigeria

BPRU: Building Performance Research Unit

BREEAM: Building Research Establishment Environment Assessment Method

BSP: Building Service Publication

BUS: Building Use Studies

CBE: Centre for Built Environment

CCC: Confederation of Construction Clients

CIBSE: Chartered Institute of Building Services Engineers

CIC: Construction Industry Council

CIOB: Chartered Institute of Building

CM: Construction Management

DQI: Design Quality Indicators

EARM: Energy Assessment and Reporting Method

FM: Facility Management

HEDQF: Higher Education Design Quality Forum

HEFCE: Higher Education Funding Council of England

MOH: Ministry of Health

OAM: Office Assessment Method

PII: Partners in Innovation

POE: Post Occupancy Evaluation

PROBE: Post Occupancy Evaluation of Buildings and their Engineering

QIDS: Quality in Design of Schools

RIBA: Royal Institute of British Architects

RII: Relative Importance Index

UK: United Kingdom

USA: United States of America

1.0 INTRODUCTION

1.1 Background of the Study

Human shelters were at first, very simple and perhaps, lasted only a few days or months. Over time, however, even temporary structures evolved into such highly refined forms as igloo. Gradually more durable structures began to appear, particularly after the advent of agriculture, when people began to stay in one place for long periods (Onu, 2009). The first shelters were dwellings, but later other functions, such as food storage were housed in separate buildings. Although design and construction have become highly sophisticated and are often computer directed, this complex apparatus rests on preindustrial traditions inherited from millennia during which most structures were lived in by the people who erected them. The technical demands on building remain the fundamental ones; to keep out enemies, to avoid gravity, and to prevent discomforts caused by an excess of heat or cold or by the intrusion of rain, wind, or vermin (Anderson, 2008)

A building must do what it was designed to do - not just provide shelter but also be an environment where people can live, work and achieve**.** Recent thinking demands that buildings are constructed to fulfil specific needs (Preiser and Vischer, 2005). Like any other living species, humans are organisms adjusting to a dynamic, ever-changing environment, and the interactive nature of relationships between people and their surrounding should be considered in design. In the same vein, Leaman (2002) opined that almost all users treat buildings as a means to an end and are not really interested in design or management matters. He also stated that they want to carry out tasks and activities as easily and effectively as possible with the least inconvenience to themselves. Vischer (2008) defined Users simply as the people who come into the building on a daily basis and carry out more or less the same types of activities while they are there.

Lawrence (2013) states that the importance of the social environment in the students life cannot be overemphasized and the integral role which the student housing assumes in overall campus planning and design evolved based on the philosophy that a close proximity exist between learning, environment and the intellectual development of universal students. According to Watson, (2003) education depends on students being supported, not frustrated, by buildings and equipment. As much as higher education around the world is intended to help students attain intellectual competence, enliven personal character, and aid in forming patterns of behaviour, thought, and imagination, campus housing as an integral component of the university plays a major role in promoting these objectives (Hassanain, 2008)

The scheme of campus housing has been supported widely by professors at colleges who believe in the English collegiate tradition of being concerned with the "whole man".

According to Zahran, (1972) The New College dormitories at Oxford – about AD 1400 provided for a complete accommodation of teaching and living requirements. The same discipline was then followed by Cambridge, Harvard and Yale. Since that time, colleges and universities then started to embark on energetic student housing programs to supplement their educational environments taking into consideration a number of reasons, which includes, the absence of a campus housing system may constitute one factor in lowering the academic performance of students, adequately planned campus housing facilities foster mutual interests and desirable educational outcomes among student population. Suitable campus housing facilities provides cooperation, security, responsible citizenship, involvement, intellectual stimulation, mutual composition and inspiration, campus housing systems promote and create institutional loyalty and eventual alumni support, campus housing systems help enlarge a student's awareness and knowledge of disciplines other than his own through contacts with roommates of different backgrounds who specialised in other fields of study, campus housing emphasises solidarity and unity among student population. It is the major common

denominator that attracts and unites students involved in different fields of studies, besides sports and cultural activities; campus housing is intended to provide for three major objectives. These are helping students attain intellectual competence, forming personal character and aiding in forming patterns of behaviour, thought and imagination which should lead to a fulfilling living experience. This clearly highlights the magnitude and importance of incorporating users' perspective in the design of the housing facilities in the academic environment. In addition, these underlying objectives gave birth to interesting concepts like Post Occupancy Evaluation.

Over the years this concept of Post Occupancy Evaluation has been extensively used in developed countries to assess the performance of buildings. Records show these evaluations have greatly aided in the construction industry. However, this concept is new to developing countries like Nigeria Yewande *et al.*, (2011)

In recent times Post Occupancy Evaluation has been used to assess the quality of buildings, with respect to fitness for purpose, satisfaction, workplace productivity, functional requirements and even design (Najib et al 2011; Wilkinson et al 2011; Newman 2009; Kooymans Rob, 2006) etcetera. Furthermore Newman (2009) declared it unethical for evaluations to be conducted where people who use the buildings are not consulted

Post Occupancy Evaluation (POE) can be defined as the "the process of evaluating buildings in a systematic and rigorous manner after they have been built and occupied for some time" (Preiser et al., 1998). Post occupancy performance evaluation tries to answer four broad questions: 'How is this building working?', 'Is it intended?', 'How can it be improved?' and 'How can future buildings be improved?' Answers to these vital questions can add value both to the buildings assessed, and to client, industry and management procedures for future building construction and renovation. (Bordas and Leaman, 2005)

Post-occupancy Evaluation (POE) is a method of evaluating the performance of buildings and facilities that has been established for many years, with variable levels of adoption and success. The rationale being the consideration of the extent to which a building satisfies the needs of its end users and to identify ways in which design, performance and fitness for purpose can be improved (Turnpin-Brooks and Viccars, 2006)

1.2 Statement of the Research Problem

Whereas designers expend considerable resources in examining the actual functioning of and user satisfaction with everyday commodities, and in refining their design accordingly, this is not the case with buildings. Although they are far more expensive than cars, audio or electrical equipment, buildings are rarely revisited and reassessed once they are handed over to their users. According to Meir, Garb, Jiao & Cicelsky (2009) it is clear that this lack of evaluation and study leads to a situation in which every single building remains a unique specimen, design mistakes are repeated, and when some re-evaluation of the building as an end product is undertaken, it is often based on non-systematic trouble shooting.

The culture of assessing the quality and performance of buildings greatly increased in recent years and have become widely practiced in developed countries. The lessons learnt from these evaluations has been incorporated into designs and refurbishments and used as a continuous improvement tool (Adewunmi, Famuyiwa & Harrison, 2009). In developed countries where the POE customs are extensive, several processes often referred to as 'protocols' and toolkits in literature have been developed through stakeholders. Examples include the Post Occupancy Review of Buildings and their Engineering (PROBE) protocol, Centre for Built Environment (CBE) protocol, Association of University Directors of Estates (AUDE) Guide to Post Occupancy Evaluation protocol, Higher Education Funding Council of England (HEFCE) UK, Building Research Establishment Environment Assessment Method (BREEAM) e.t.c were developed.

In addition to this, still on the international scene, several toolkits have been developed for the evaluation of schools such as Quality Indicators in the Design of Schools (QIDS), (Schoolworks 2004), which do not take into account the voices of all its stakeholders. Design Quality Indicators (DQI) developed by the Construction Industry Council, is a more comprehensive means of evaluation, asking questions on functionality, build quality and impact of school buildings. It does not however fully interrogate the specific functions of a school. For example it asks only two questions on teaching and learning, and it does take into consideration the housing function in a higher institution. However, one work stands out from the rest, as it considers the voices of all its stakeholders in the evaluation, but it was done for primary schools in the UK (Newman, 2009). The research substantiated that the toolkit developed was capable of producing usable guidelines for future builds.

However these protocols are not suitable for use in developing countries (Leaman, 2002). Instead the question arises about global similarities and differences, especially in building users' attitudes and preferences. The question posed however is, how all user groups can be included in the evaluation of on-campus student housing facilities in Nigeria? It is therefore clear that there is a need to develop a POE toolkit that takes into account all user groups and is specific for evaluation of on-campus students housing facilities in the Nigerian academic Environment.

1.3 Justification of the Study

The design of the school environment has a direct impact on the teaching and learning activities, which can be supported or frustrated by the building elements. Evaluating new and existing facilities can benefit all those involved in educational buildings, from the school users to the local authority to designers (Watson & Thomas, 2005)**.** Particularly having a tool that can evaluate buildings as well assess user needs specific to our environment and would

enable a customised evaluation of our needs taking into consideration our unique requirements would be greatly beneficial.

According to the British Council for offices (2007), with evaluation of buildings taking place specific opportunities such as; discovering if the building in question supports the need of the occupants, identifying flaws so as to correct them rapidly and enhancing the performance of its occupants would not be missed.

In today's higher learning environment, demand for modern campus housing has increased (Najib and Yusuf, 2009; khozaei , Hassan & Khozaei, 2010). Modern housing facilities are considered essential to cater to students housing needs (Susilawati, 2001; Hassanain, 2008; Najib and Yusuf, 2010).

Also in line with the proposed Phase II development of Ahmadu Bello University, it is necessary for the evaluations of existing buildings to be carried out to ascertain the needs of users and to set the pace for future designs. In a related development Ahmadu Bello University pledged to partner with estate developers towards providing adequate hostel accommodation to its teeming students in and around Zaria to ensure proper security of lives and property (Alumni, 2013)

By undertaking Post Occupancy Evaluation, local authorities recognise that buildings, for example schools, are not perfect, but that every effort should be made to continually improve the educational facilities within the resources available. According to Watson (2005), the specific reasons for evaluation of buildings include; Fine tuning new buildings, improving design for future buildings, demonstrating best value, building stakeholder commitment and evaluating existing buildings. Therefore the need to feel included, to identify, develop and express personal view as well as being aware of the needs of others are all essential experiences in developing these capacities. Being involved in a participatory Post Occupancy

Evaluation process fits very well in supporting these qualities and experiences for students and aids to build a positive school ethos generally.

This knowledge will assist in option appraisal and inform investment decisions about achieving the optimum balance between levels of refurbishment, remodelling or a new build of on-campus housing that conform to global standards.

1.4 Aim and Objectives.

1.4.1 Aim

The aim of this research is to develop a Post Occupancy Evaluation toolkit to assess end user satisfaction of on-campus housing facilities specific to the Nigerian environment.

1.4.2 Objectives

Thus the objectives of this research are outlined as follows;

i. To articulate the Post occupancy Evaluation concepts, protocols and their related strategies.
ii. To identify the key areas and issues the proposed POE toolkit should evaluate.
iii. To establish key areas and issues the POE toolkit should evaluate specific to the Nigerian academic environment
iv. Development of a POE toolkit for evaluating hostel buildings.

1.5 Methodology

According to Fellows and Liu (2003), the methodology clearly answers the question “How” in a research. Thus the methodology of this study clearly states the procedure to achieve the objectives outlined in the project.

This research made use of the Qualitative research approach to gain insights, opinions of the people being investigated. In addition, the Quantitative approach was employed through the gathering of factual data and the study of relationships between facts and how such facts and

relationships accord with theories and the findings of any research executed previously from literature(Fellow and Liu, 2003).

This research carried out the following procedures:

I. A review of past literature, books, journals and articles to clearly understand the concepts, methods, processes, and review tools of POE and its need in the Nigerian context.

II. In establishing the key areas of the Post Occupancy Evaluation toolkit, a review of literature, structured observations, semi-formal interviews and interviews were conducted on the users.

To substantiate the findings in the reviewed literature and structured interview a survey was carried out using well structured questionnaires to collect data on the required functional performance of the facilities from users of on-campus housing in Ahmadu Bello University,

III. Following the review of established literature and existing POE toolkits, Examples include the Post Occupancy Review of Buildings and their Engineering (PROBE) protocol, Centre for Built Environment (CBE) protocol, Association of University Directors of Estates (AUDE) Guide to Post Occupancy Evaluation protocol, Higher Education Funding Council of England (HEFCE) UK, Building Research Establishment Environment Assessment Method (BREEAM). A Post Occupancy toolkit was developed based on issues and areas of concern obtained from the survey exercise, which clearly identified needs highlighted by the different user-groups identified.

1.5.1 Sample size

The stakeholders considered in this study are students, visitors, and management staff of the hostel facilities.

I) Students Sample

Ahmadu Bello University is the largest University in Nigeria and second largest in Africa, second only to Cairo University Egypt (Wikipedia, 2013). Its' On-Campus Undergraduate Hostels are in seven (7) clusters, four (4) of which are for the Male students, two (2) for the female students and one (1) for both male and female located in the study area. Each cluster consists of several housing blocks with majority of the rooms designed to accommodate two occupants at a time; at one hostel, the rooms are designed for up to four students. For this research a Random Cluster Sampling technique would be used to select the respondents of this survey from every hostel wing and floor consequently. This sampling method was chosen according to methods used by Lam et al. (1998); Adamchak et al. (2000); Burton et al. (2005) and Najib et al. (2011) because the respondents are already "naturally" clustered into groups(that is by block, hostels and gender).

The total population size of students in Alex/Ribadu Hall and Amina hall was 1325 and 2104 respectively (A.B.U, 2013).

A Student user size was obtained using: $\mathbf{ss= (z^2P*(1-P)/D^2}$ ——————— 1.1

Correction for finite population=

$$New\ SS = \frac{SS}{1+\frac{[SS-1]}{pop}} \qquad \text{——————} 1.2$$

Where;

Ss= sample size and SS= new sample size.

P = True proportion of factor in the population, or the expected frequency value

D = Maximum difference between the sample mean and the population mean,

Or Expected Frequency Value minus (-) Worst Acceptable Value

Z = Area under normal curve corresponding to the desired confidence level. For the purpose of this study, a confidence level of 95% will be adopted.

Z= 1.96, P=0.2, 1-P=0.8 and D= 0.04

Hence,

ss= [(1.96)x0.2x0.8]/.04^2= 384.16

Correction for finite population therefore is; applying $New\ SS = \frac{SS}{1+\frac{[SS-1]}{pop}}$ ———————— 1.3

New SS=345.55, approximated as **346 students.**

II) Visitor sample

Due to the variability of the population of the visitors to the hostels, purposive sampling technique was employed.

III) Hostel Management Sample

The management of the hostels within the study area include; 3 Hall Administrators and 3 Assistant Hall Administrators for Amina, Ribadu and Alexandra halls respectively. The research observed that the workforce of the hostel management staff consisted of 7 porters, 6 Matrons, 1Housekeeping, 5 Hall supervisors and 4 Assistant Hall Supervisors together with cleaners, carpenters, plumbers, electricians and security staff.

1.5.2 Data collection technique

The data was collected using well structured questionnaires from the stakeholders, observation and interviews of the hostel management.

1.5.3 Data analysis

The data collected was analysed using the Statistical Product for Service Solution (SPSS); relative importance index analysis to determine the relative importance of the design considerations provided by the stakeholders, and descriptive analysis in order to obtain frequencies and percentages of data.

1.6 Scope and Delimitations

1.6.1 Scope

The scope of this study is to develop a Post Occupancy toolkit to evaluate students' hostel. The research covered the female hostels in Ahmadu Bello University Zaria; namely Ribadu, Alexander and Queen Amina Halls of Residence. The target population included students, visitors and hostel staff and management. The Study dealt with design considerations only and does not include any social and management issues.

1.6.2 Limitations

The development of the Post occupancy evaluation toolkit was based on subjective perceptions of all the user groups involved on the design considerations of the hostel facility. It only studied the female students' hostel facility in Ahmadu Bello University.

2.0 LITERATURE REVIEW

This chapter presents a review of literature on the origin and history, the available protocols, strategies and toolkits of post occupancy evaluation. A section is slated to discuss educational facilities ergonomics and the effect of properly designed built environment on student learning and development. It also identifies from literature the stakeholders of on-campus housing facilities. The review informed the development of an appropriate method which captured the voices of all stakeholders. The aim of this research was to develop a suitable post occupancy evaluation toolkit to assess end-user satisfaction of on-campus housing facilities specific to the Nigerian Academic Environment. The final section demonstrates how the literature has informed the development of the Post Occupancy Evaluation toolkit.

2.1 Origin and History of Post-Occupancy Evaluation

The term Post Occupancy Evaluation (POE) originates from the occupancy permit which was issued by building inspectors to confirm that building was fit for occupancy once it had been completed (Bechtel, 1997). Formal post occupation evaluation has its origins in the UK where the British Ministry of Education in conjunction with Local governments first undertook evaluations of buildings in the post world war II period. The first buildings that were evaluated were school buildings and resulted in series of building bulletins for schools. Preiser et al., (1988) states that the US followed in the early 60's with the Schools Construction System Development in California in 1961. The intention to carryout feedback in the UK began to gain momentum in the 1960's when twenty Architectural and Engineering practices, Royal Institute of British Architects (RIBA), the Architect's Journal and Ministry of Public Building and Works sponsored the Building Performance Research Unit (BPRU) at the University of Strathclyde to commence feedback, to bring together, teaching and Design on building performance and publish results. BPRU lasted for four years with its work being primarily on schools (Bordas & Leaman, 2005). On the word of Preiser (1995) POE was

introduced as an answer to significant problems experienced in building performance with particular emphasis on the building occupant perspective. POE and its associated processes have been highlighted as an important stage in the lifecycle of a building demonstrated by how it has been incorporated in the Royal Institute of British Architects' (RIBA) 'plan of work' in 1965 when it came to prominence in the early 1960's. This is the culmination in Part M: feedback, which was seen as the 'most cost effective way of improving service to future clients (RIBA, 1965)

POE was identified as a component of the Project Delivery System used by Public Works Canada in the early 1980s, and was intended as a final stage in the programming, design, construction, and occupancy process of federal projects. It was also in the 1980s as detailed by Kooymans (2006) that there were significant advances in theory, method, strategy and application of post occupation evaluation which was as a result of a growing interest in this field and higher levels of accountability for both managers and designers.

2.2 Concepts of POE

According to Cooper (2001), without a process in place to obtain feedback from a building's performance, having being constructed with new systems, in new ways with unknown outcomes it remains a prototype. As indicated by Kooymans (2006), the post occupancy evaluation of productive buildings is, in a general sense, the extent to which the buildings being evaluated meet the intended goals set by its designers. Apart from identifying the extent to which the buildings meet the intent of the designers, post occupancy evaluation also identify best practices that can be used to improve future designs (Forbes 2003). Federal Facilities council (2002) stated also that POE was not the end phase for a building or refurbishment project rather an integral part of the entire building delivery project. An evaluation renders the identification of environmental factors that need improvement,

diagnosis of causes for occupant dissatisfaction and supervision of occupant perception of building, and consequently the contractors' performance (Huizenga, 2002).

The import of POE can be seen from a number of standpoints, particularly the Architectural professionals and facilities managers. The Royal Institute of British Architects (RIBA) see POE as a systematic way of gathering invaluable information on the performance of their designs allowing them to build on guidelines to continuous improvement (RIBA, 1991). In addition, from the perspective of facility managers it is a diagnostic tool and system which allows them identify and evaluate critical aspects of building performance systematically as stated by Preiser (1995).

A definition of Post Occupancy Evaluation (POE) reads as follows:

> *Post-occupancy evaluation is the process of systematically comparing actual building performance, i.e., performance measures, with explicitly stated performance criteria. These are typically documented in a facility program, which is a common pre-requisite for the design phases in the building delivery cycle. The comparison constitutes the evaluation in terms of both positive and negative performance aspects (Preiser, Rabinowitz & White 1988).*

The success of any organisation is largely influenced either negatively or positively by a space. Zimmerman and Martin, (2001), proposed that if the functional fit of the clients' organization with the space is poor, the functioning of the organization can be affected. At a minimum, this will increase costs and reduce organizational competitiveness, and in extreme cases could potentially cripple an organization.

The principal benefit from conducting Post Occupancy Evaluations' is the provision of valuable information to support the goal of continuous improvement. According to Zimmerman and Martin (2001), "A proper POE should provide real information on which to base decisions, and real information is key to informing and improving the next project".

There can be situations in which the intended use of a space or a building can change between the time of its conception, design and completion, in such cases POE's can be

utilised to identify the new requirements or functions and provide the basis for the necessary changes to bring it into line.

2.2.1 Levels of conducting POE

Preiser (1995) established a process model after taking into consideration the various methods of conducting POE. Figure 2.1 shows a model representing the three (3) phases and nine (9) steps of the POE process.

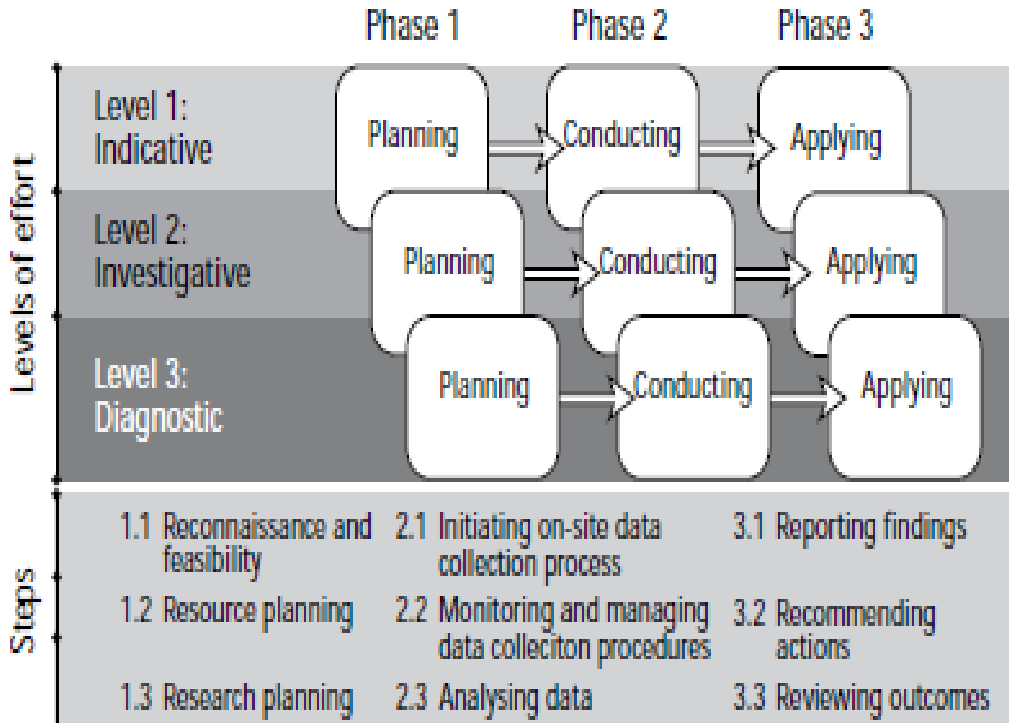


Figure 2.1 Post-occupancy Evaluation process Model.
Source: (Preiser, 1995)

Three levels of effort in typical POE endeavours have been identified by Preiser and Vischer (2004) as:

i. Indicative

ii. Investigative

iii. Diagnostic

Indicative POEs are quick, walk-through evaluations, involving structured interviews with key personnel, group meetings with end-users, as well as inspections in which both positive and negative aspects of building performance are documented photographically, or on the notepad. On the other hand, Investigative POEs are more in-depth and utilize interviews and survey questionnaires, in addition to photographic/video recordings, and physical measurements, they typically involve a number of buildings of the same type. Diagnostic POEs require considerable efforts as they are more focused, longitudinal and cross-sectional evaluation studies of such performance aspects as stair safety, orientation and way finding, artificial versus full spectrum lighting, privacy, overcrowding, etc

2.2.2 Benefits of POE

The short term, medium term and long term benefits of POE have been laid out in "Learning from Our Buildings: a State-of-the-Practice summary of Post Occupancy Evaluation" by Federal Facilities Council (2002), and are outlined below.

A. Short-term benefits

i. Identification of and solution to problems in facilities

ii. Proactive facility management responsive to building user values

iii. Improved space utilisation and feedback on building performance

iv. Improved attitude of building occupants through active involvement in the evaluation process

v. Understanding of the performance implications of changes dictated by budget cuts

vi. Better-informed design decision-making and understanding of the consequences of design.

B. Medium-term benefits

i. Built-in capacity for facility adaptation to organisational change and growth over time including recycling of facilities into new uses

ii. Significant cost savings in the building process and throughout the life cycle of a building

iii. Accountability for building performance by design professionals and owners.

C. Long-term benefits

i. Long-term improvements in building performance

ii. Improvement of design databases, standards, criteria and guidance literature

iii. Improved measurement of building performance through quantification.

2.3 Drivers and Inhibitors of the POE Process

Cooper (2001) argued that previous laissez faire approaches of the industry were condemned, and processes such as POE have been brought back into the mindset of the industry. Having established that, there still remain factors that serve to make POE practice easier and some that act otherwise. According to Whyte and Gann (2001), many drivers exist that justify the claims for the use of POE on a more regular basis, which include:

i. Applying design skills with greater effectiveness,

ii. Improving the commissioning process,

iii. Improving and adhering to user requirements,

iv. Offering valuable knowledge for guides and regulatory design processes,

v. Helping target refurbishment.

Table 2.1 furnished by the British Council for Offices (2007), demonstrated the perceived barriers to Post Occupancy Evaluation by the following groups; Occupiers, Designers and Facility Owners.

Table 2.1 Perceived barriers to POE.

	Perceived barrier
Occupiers	'The designer or facilities manager will benefit most from conducting a POE so why should we pay for the service'. 'It will cause disruption to staff or raise HR issues'.
Design Team	'If the design is found to be poor, the study may have a detrimental effect on our reputation'. 'We're worried about liability – the evaluation may reveal defects or areas where the brief has not been fully met and we may be held accountable'. 'The cost of providing a POE service'.
Facilities Managers	'It will ''open a can of worms'', and anyway we haven't received any complaints, so we don't need a survey.' 'The cost of conducting a survey.'

Source: British Council for Offices (2007)

From literature the most important inhibitors to POE development include

i. its lack of ownership,
ii. associated cost and
iii. Culture/education.

a. Ownership

Although all parties appreciate benefit accrued from the POE concept, the chief concern is who takes ownership? Ownership tends to be deflected by professionals, with the reluctance to becoming liable for the associated costs. As POE plays no part in the standard procurement process, there is little motivation for designers to go beyond what is asked of them not to unearth results that would lead to liability claims (Riley, Moody & Pitt 2009). According to Januzens et al (2003), clients believe they have spent enough in terms of time and money procuring a building. Consequently, project team members believe they would need permission from the client and occupiers and be responsible to sort any problems uncovered. On the other hand, occupiers believe moving in, is disruptive enough and would want to get on with their work. They are not convinced of POE's cost effectiveness. According to

Zimmerman and Martin (2001), unless POE is seen as a standard part of the procurement process the full benefits of the process will not be achieved, particularly with reluctance to take ownership.

b. Cost

In a bid to clarify who the responsibility of the process belongs to, Cooper (2001) presented two questions that needs to be addressed; who is responsible for commissioning and paying for evaluation, and who is professionally responsible to carry them out. On the part of the client therefore, unless benefits and value are certain, then a reluctance to pay for the evaluation process is sure to exist. This is also echoed by Turnpin-Brooks and Viccars (2006) who says a developer has a reluctance to take ownership of the cost as it might eat into the projected margins they have made through the course of the project. Given that designers are almost never paid to reassess the impact of their design decisions, no incentives exist for continual improvement through the feedback process, Zimmerman and Martin (2001).

Bordass and Leaman, (2005) believed that there would be a greater likelihood that POE would be incorporated into procurement and professional development processes on a regular basis if the procedures involved in POE been made cheaper and less time consuming,.

c. Culture/Education

Cultural and educational issues present barriers to the use of POE as many expect designers, builders and their project managers to have an exhaustive knowledge of building performance. In fact, not only are they not trained in this area, they do not have an obligation and are not paid to carry out the process Bordas and Leaman (2005).

This lack of regard for POE within the industry could be seen to be shaped to an extent by the fact that the concept was for all intents and purposes, removed from the architectural curriculum in the early 1990s, (Cooper, 2001). Zimmerman and Martin (2001), adds that an

‘ignorance is bliss’ mentality exists within the industry, which contradicts new methods that exist with the aim of working more efficiently. This is demonstrated by commercial building owners, who fear that processes such as POE could potentially highlight shortcomings and negatives in the building performance, which could lead to tenants being lost eventually.

Riley, Moody & Pitt (2009) concluded that though the experiences of users are varied, there were some significant barriers to its wide spread adoption within the construction industry regarding; the cost, complexities on the issues of ownership and culture which inhibit the extent to which it is being embraced and understood by property professionals and in particular client organisation.

2.4 The Construction Industry, Construction Management and POE

The Chartered Institute of Building (CIOB, 2014) stated that construction industries throughout the world are challenged to improve performance if they are to contribute fully to the achievement of economic prosperity, sustainable environments and healthy populations.

According to Construction Benefit Services (CBS, 2014), the construction industry is:

i. the construction or erection of a building or structure that is or is to be fixed to the ground and wholly or partially fabricated on-site;
ii. any preliminary site preparation work (including pile driving) for the construction or erection of any such building or structure;
iii. the alteration, maintenance, repair or demolition of any building or structure, excluding electrical or metal trades maintenance or repair work;
iv. the laying of pipes and other prefabricated materials in the ground, and any associated excavation work;

v. the construction, erection, installation, extension, alteration or dismantling of a transmission or distribution line, or plant, plant facility or equipment used in connection with the supply of electricity; or an air-conditioning, ventilation or refrigeration system;

vi. the construction, erection, installation, extension, alteration, service, repair, replacement of parts or dismantlement of a lift or escalator;

vii. Any electrical or metal work associated with other engineering projects.

Given the elaborate and clearly stated functions of the construction industry by the Construction Benefits Services (2014), the work effort in the industry does not end at the completion of the structure but lasts throughout its life. According to Bordas and Leaman (2005), if building performance assessment and feedback is to become a routine part of building delivery and the building's lifecycle, POE procedures have to be made quicker and cheaper. They are more likely to be incorporated into procurement, briefing, management and professional development processes in simple, direct and timely ways.

On a global scale there is growing effort to take studies of the performances of occupied buildings in order to meet up the need for more efficient and sustainable buildings. The potential of these performance studies extends outside the benefits for improvement to the particular building being investigated to future buildings.

As stated by Cooper (2001), an early influence which led precisely to the development of POE in Britain was the study of the organisation, quality of service, and productivity of architectural practices conducted by the Royal Institute of British Architects (RIBA) in the early 1960s. When such studies of buildings in use started to appear in Britain, from the late 1960s onwards, there were not the product of architectural practices as opined by Cooper (2001), instead they were produced by researchers working in a newly emergent academic discipline- environmental psychology-concerned with the study of people and their physical

surroundings. Preiser (2002) discusses the importance of POE in the industry as stating that it adds local/contextual data to state-of-art facts of a given building type. In addition, Preiser (2002) explained that if it was not the case, stereotype one-size-fits-all buildings may well be produced for use all over the world.

According to Bordass, Leaman & Eley (2006), buildings can add substantial value for their clients, their occupiers, the economy and the environment. In spite of this, opportunities are regularly missed and value pointlessly subtracted because people do not learn enough from the buildings they make. Many buildings do not perform as planned - in some cases this can impact on running costs, staff and client satisfaction and performance, health, safety and comfort. For recurrent construction clients, learning from and correcting past mistakes in design and commissioning of buildings can be extremely cost-effective and greatly improve workplace productivity.

POE is valuable in all construction sectors, especially healthcare, education, offices, commercial and housing, where poor building performance will impact on running costs, occupant well-being and business efficiency.

Regardless of an increasingly encouraging atmosphere for POE to operate, there still remains a reluctance to engage in any form of systematic evaluation process from the players within the construction industry (Karim and Crozier, 2008). It is incumbent on those outside to clearly indicate the purpose, and hence the value, of conducting POE as a matter of course.

Zimmerman and Mark (2001) suggest also that despite the propagation of purposes and reasons "the overarching benefit from conducting POE is the provision of valuable information to support the goal of continuous improvement in the construction Industry". Previously highlighted also were a number of plausible benefits of POE as detailed by Whyte and Gann (2001) to include;

i. applying design skills more effectively;
ii. improving commissioning process;
iii. improving user requirements;
iv. improving management procedures;
v. providing knowledge for design guides and regulatory processes; and
vi. targeting of refurbishment

These aforementioned benefits to be accrued from POE, encapsulates the processes in the construction industry from start to finish. In broad terms, according to Karim and Crozier, (2008), it could be suggested that POE provides a method of gathering information that is of value to all stakeholders within a building life cycle, with specific elements of this information being of benefit to particular stakeholders.

The Chartered Institute of Building (CIOB) whose mission is to contribute to the creation of a modern, progressive, and responsible construction industry; able to meet the economic, environmental and social challenges faced in the 21st century. The CIOB, according to Bale (2010), gave an inclusive definition of Construction Management as;

i. the management of the development, conservation and improvement of the built environment;
ii. exercised at a variety of levels from the site and project, through the corporate organisations of the industry and its clients, to society as a whole;
iii. embracing the entire construction value from inception to recycling, and focusing upon a commitment to sustainable construction;
iv. incorporating a wide range of specialist services;
v. guided by a system of values demonstrating responsibility to humanity and to the future of our planet;
vi. and informed, supported and challenged by independent academic discipline

Construction Management (CM) is recognised throughout the world as one of the family of disciplines concerned with the complex phenomenon known as the 'Built Environment' (BE). The planning, design, production, adaptation, maintenance, restoration, conservation, management, evaluation (of which this research is about) and recycling of the built environment requires interaction between disciplines. This interaction should bring about knowledge exchange between stakeholders on their dealings with buildings.

From the architectural point of view, the Royal Institute of British Architects – RIBA (1991) defined Post Occupancy Evaluation as "a systematic study of buildings in use to provide architects with information about the performance of their designs and building owners and users with guidelines to achieve the best out of what they already have". In addition Karim and Crozier, (2008) mentioned that POE provides a method of gathering information that is of value to all stakeholders.

The construction value course begins with a perceived need for a new or improved structure, and flows through the stages of investigation, design, production, commissioning, facility management, maintenance, adaptation, conservation, restoration, dismantling and recycling. The future role of construction industries, as stated by Bale (2010) and therefore of CM, is increasingly the stewardship of the built environment.

2.5 Application of POE in Advanced/ Developed Countries

2.5.1 POE in the UK

One of the initial influences that led directly to the development of POE in Britain was the study of the organisation, quality of service, and productivity of architectural practices conducted by the Royal Institute of British Architects (RIBA) in the early 1960s as stated by Cooper (2001). This was included as the final part of its 'Plan of Work', stage M: Feedback- that architects, with their clients should inspect completed buildings, two or three years after

completion, as ‘the most cost effective way of improving service to future clients’. In subsequent editions, both stage M and this advice were deleted from the Handbook and its accompanying plan of work. Instead when building in use studies began to appear in Britain, from 1960s onwards they were not products of architectural practices as opined by Cooper (2001) but were produced by researchers working in a newly emergent discipline of environmental psychology – concerned with the study of people and their physical surroundings. Canter (1970) made this clear at the disciplines first conference, sponsored by RIBA. Although many POEs have never resolved or explored critically the relationship between its ‘body of evidence’ and building designers subsequent decision-making, the Partners In Innovation (PII) funded Post Occupancy Evaluation of Buildings and their Engineering (PROBE) series has succeeded in: identifying actions which actually make a difference and intervening (PROBE phase 3) alongside clients, designers and facilities managers on live projects to inject strategic change (Jaunzen *et.al,* 2002) As a result of the changes to the funding offered by the UK Government for building research, the concept of POE was again embraced. The PROBE team which was put together to that effect in 1994 had representatives from Building Service Publication (BSP), Chartered Institute of Building Services Engineers (CIBSE), and other multi-skilled individuals. The objective was to publish POEs after three years on newly constructed buildings of technical interest, (Preiser and Vischer, 2005). Since its existence, it has been embraced more so outside of the United Kingdom, particularly within the USA (Cooper, 2001). Its re-emergence within the UK has come mainly because of Government driven initiatives, such as Rethinking Construction, (Egan, 1998).

The last few years as stated by Jauzen *et.al* (2002) have seen concerted efforts to promote routine POE. For example:

i. The Confederation of Construction Clients (CCC) has a mission to 'secure major measurable and consistent improvement in performance across the industry'.
ii. The Construction Best Practice Programme administers a series of performance indicators for customer satisfaction with the construction product and the construction process.
iii. BREEAM (2002) gives a credit for having a means of measuring staff satisfaction, and a further credit for using it to set performance improvement targets.
iv. RIBA Practice Services suggest that in terms of the interaction between clients and users, the greatest improvement would come through 'the provision of systemised feedback and instituting POE'.

2.5.2 POE in Brazil

POE studies started in Brazil in the early 1970s when introduced to an interdisciplinary group of researchers from the state of Sao Paulo Institute of Technological Research (IPT). This was aimed at evaluating social housing in the academia by the faculty of Architecture and Urbanism of the University of Sao Paulo (FAUUSP) in 1984 when a graduate course entitled 'Post-Occupancy Evaluation of the Built Environment as Design Methodology was Offered for the first time (Ornstein *et al.,* 2012). Since the 1970s and increasingly in the last two decades, there has been a gradual dissemination of the POE techniques and the results of the research related to it.

In Brazil, POE has been applied by teams of researchers and consultants in important universities, research institutes and consultancy firms since the early 1980s and over the last 20years (Sheila, 2005). The Centre for Research in Technology of Architecture and Urbanism (NUTAU/USP) and FAUUSP have expended great efforts in developing and experimenting on methodological procedures in POE, especially for situations related to users' needs and

satisfaction in built environment, such as office buildings, hospitals, parks, and, especially, places of social interest such as housing and public schools(Romero, 2003).

2.5.3 POE in America

Preiser and Nasar (2008) opined that the evaluation of case studies in university dormitories in the late 1960s carried out by Sim Van der Rijn of the University of California, Berkeley, and Victor Hsia of the University of Utah, were not called POEs. The evaluations were among the first systematic attempts at assessing building performance from the building users' point of view. It was further revealed after extensive search that the first publication with the term "POE" in their title was published by an author called Herb McLaughlin of KMD Architecture in San Francisco in the AIA Journal issue of 1975. Over time researches in POE have grown in leaps and bounds extending also onto public works projects, government buildings, airports and the likes and have substantiated in very sizeable and noteworthy POE studies.

2.6 POE IN DEVELOPING COUNTRIES

2.6.1 POE in Malaysia

It has been established in the preceding sections that POE is of common practice in developed countries like the USA, Australia, UK and other European countries. This is due to the fact that globally there are growing efforts to undertake performance studies of occupied buildings in response to the quest for more efficient buildings to meet sustainability challenges Saiful and Norhati (2010)

Malaysia is a developing country with a vision to be a fully developed nation by 2020. Saiful and Norhati (2010) observed that Malaysia in its pursuit to be a developed nation has undergone unprecedented change in the last five decades in terms of social, economic and environment. This drive the researcher emphasized towards socio-economic progress has resulted in rapid change in the natural environment, and likely to pose severe threat and

impact in the long run. It's in awareness of this potential consequence, that the nation has made its commitment towards sustainable development clear since 1996 in the 7th Malaysia Plan. The initial governmental effort to implement POE programme can be traced back to the Ministry of Health (MOH) in 1997. The results of the evaluation were used in the mid-term review of the seventh Malaysia Plan (1997) and preparation of the Eight Malaysia Plan (2001-2005).

Saiful and Norhati (2010) concluded that the POE programme initiated at MOH has not evolved since its introduction in 1997; its not evolving was not in a wide-ranging manner and can therefore be considered a relatively new area that has not been significantly explored. Also in lieu of the recently introduced Malaysian Green Building Index (GBI) rating system, it is suggested that the POE procedure adopts this assessment tool which would make benchmarking of building performances in the country possible.

2.6.2 POE in Nigeria

Post Occupancy evaluation as defined by Baird (2001) is "generic term for a variety of general programs and procedures as well as specific techniques for the evaluation of existing buildings and facilities". It involves systematic evaluation of opinions about buildings in use, from the perspective of the people who use them. POEs are intended to compare systematically and rigorously the actual performance of buildings with explicitly stated performance criteria stated Jiboye (2012) and the difference between the two, according to the researchers constitutes the evaluation. This phenomenon according to Yewande *et al* (2011), in third world countries can be attributed largely to the reactive maintenance "syndrome". Most management companies in Nigeria, the study reiterated, adopted the reactive approach to maintenance accounting for why many buildings are in poor state of management. This approach is not customer-focused, while many users and occupiers of these buildings, particularly the public buildings are not satisfied. Agagu (2006) in his

findings showed that there was a dearth of training of Facility Management (FM) providers on the difference between property maintenance and user-focused facility maintenance. In addition there is also a lack of orientation of users on the importance of the cooperation and feedback they can provide during the process of evaluation.

Yewande *et al.* (2011) in the study carried out on Post-Graduate hostel facilities in the University of Lagos, Nigeria, and problems constraining the use of POE in Nigeria indicated that there is inadequate implementation of regulations needed to ensure that the conditions of buildings are improved. Furthermore the study opined that a good many managers, particularly in the public sector, have little or no funds to manage the buildings in their portfolio.

2.7 POE and Student Housing Facilities

An institution's policy that makes allowance for the development of residential accommodation within its campus for students, aims at improving the well-being of those students. Egwuom (2010), views that the act of providing accommodation for the students of an institution within an academic community, creates heterogeneous setting for social interaction and development. It brings together students from different academic, cultural, racial, gender, social and economic backgrounds.

A unique benefit of the English collegiate tradition of "caring for the whole man" is the establishment of housing within the educational environment to supplement it. On the word of Hassanain, (2008) the provision of campus housing is intended to provide help for a student for three major objectives:

1) To attain intellectual competence
2) To form personal character

3) To form a pattern of behaviour, thought, imagination, which should lead to a fulfilling living experience.

Amid the first systematic attempts to evaluate a building's performance, from the building users' perspective, was Rijn and Hsia on assessing American university dormitories in the late 1960s (McGrath, 2011). In 2008 Hassanain studied the degree of satisfaction in terms of both technical and functional performance in student housing facilities of which with his findings developed a supposed Post-occupancy Evaluation model. A few number of studies explored the physical and social factors that influence residential satisfaction with student housing Foubert *et al.* (1998), in the United States and Khozaei *et al.* (2010) in Malaysia. Kaya and Erkip (2001) also evaluated student satisfaction, relating to the perception of room size and crowding all the way in Turkey. Dahlan *et al.* (2009) explores POE using a narrower view on specific aspects of students housing satisfaction namely thermal comfort. Coming close home Amole (2009) examines the characteristics of residence halls in Nigeria that corresponds with high levels of residential satisfaction among students. In more recent times, Khozaei *et al.* (2010) study the correlation between students' satisfaction and sense of attachment to a particular student housing facility in Malaysia. Adewunmi *et al.* (2009) carried out a POE study on the facilities of a Post graduate hostel in Nigeria.

2.8 Educational Facilities Ergonomics

"Design is a functional expertise that holds apart, but also brings together the craft of making and the experience of using" (Cardellino *et al.* 2009). Having been generally acknowledged that both designers and building users' expectations are divergent as well as their awareness of the quality of building, it cannot henceforth be supposed that a building said to have satisfied the expectations of a designer would likewise meet the expectations of its users, this was as argued by Rebãno-Edwards(2007)

2.8.1 Performance levels: a hierarchy of users' needs and priorities

Clearly similar to the hierarchy of human needs by Maslow and Vitruvius many decades ago are the levels of users' needs by Lang and Burnette (1974) and further integrated into the 'habitability framework by Preiser and Visher 1983 and 1989 respectively. These levels of priority are represented in figure 2.2 as follows:

1. Health, safety and security performance;
2. Functional, efficiency and work flow performance;
3. Psychological, social, cultural and aesthetic performance.

This hierarchy order connects the elements of buildings and its setting to building users' needs and expectations. In this regard, the physical environment of the building is considered as more than just a building because of the focus on settings and spaces for specific activities engaged in by the users.

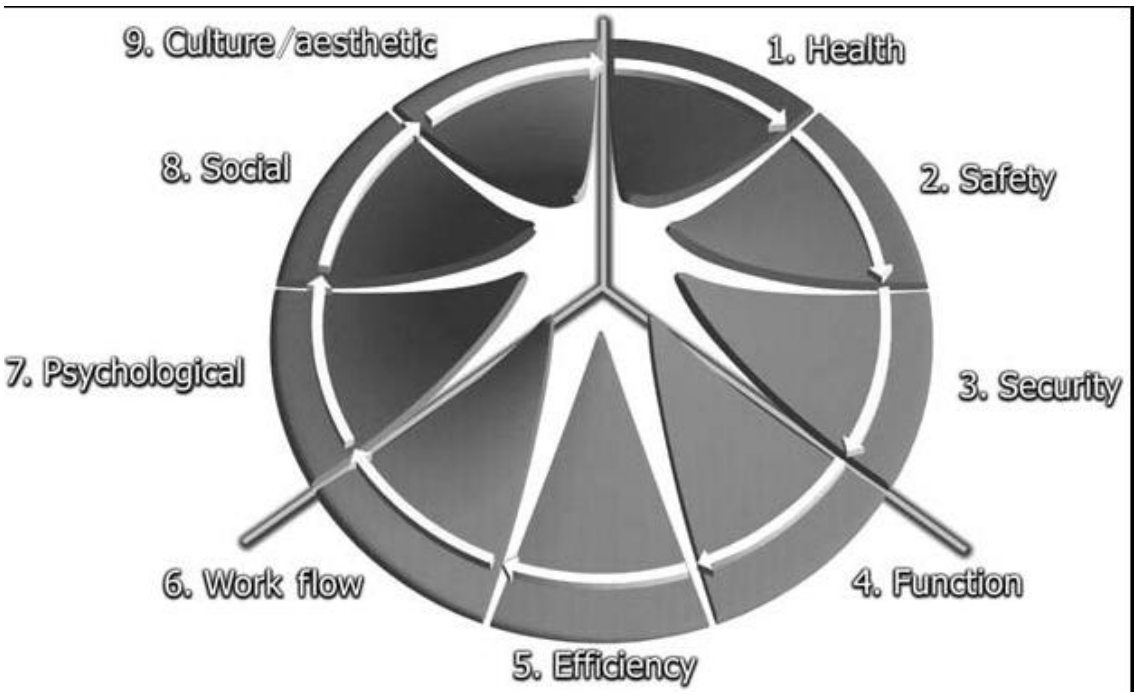


Figure 2.2; levels of evolving performance criteria
Source: Jay Yocis (2005)

Further expatiated by Preiser and Schramm (2005) are the relationships that exist between buildings, it occupant and their needs. The physical environment is considered as more than just a building as a result of the focus on settings and spaces for particular activities as engaged in by users (Preiser and Vischer, 2005). In addition, the evaluation relates buildings and settings to users and their environmental needs, comparing the actual performance of buildings and systems to explicitly documented criteria for their expected performance.

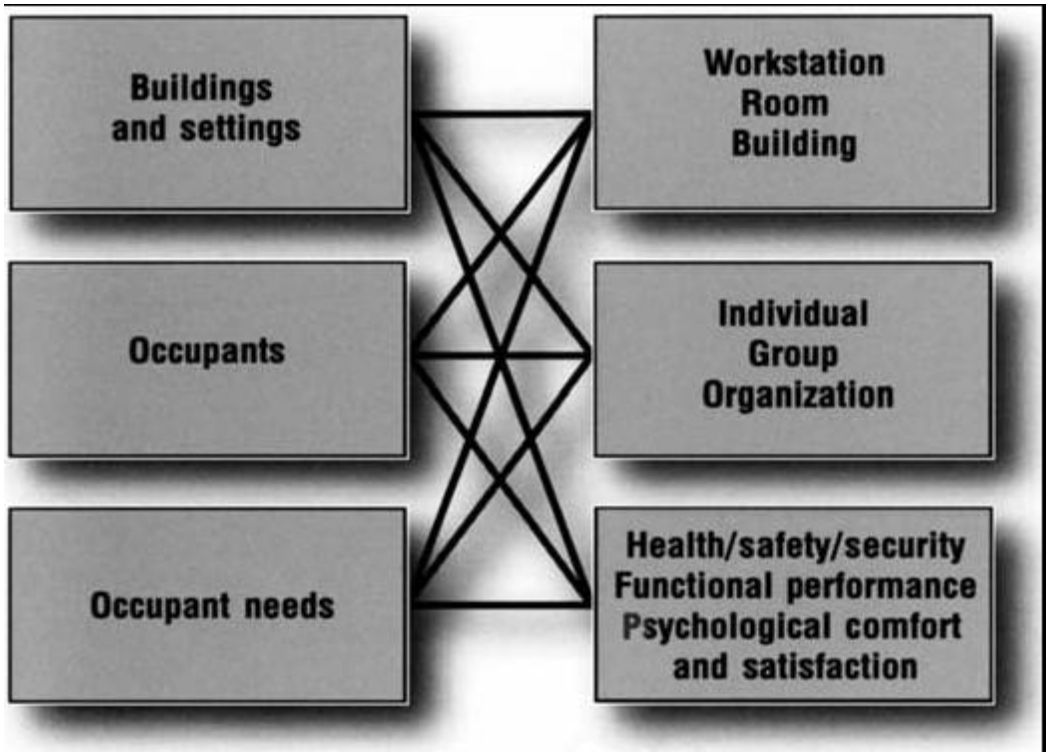


Figure 2.3; Inter-relationships between buildings, occupants and occupants needs
Source: Preiser (2005)

2.8.2 Housing facilities and its effect on student learning and development

The idea and formation of student housing is borne from the model of standard family house as maintained by Najib *et al* (*2011*). The forerunner in availing residential facilities to their students is Al-Azhar University in Cairo Egypt which was established in 969 AD (Hassanain, 2008)

The prevalent viewpoint then is that a college or university's responsibility is the total guidance of the individual not excluding social and personal education as well as providing housing facilities for its students (Hassanain, 2008).

According to Pat-Mbano (2012), an institution that allows for the development of residential accommodation within its campus for students, aims at improving the well-being of those students. The very act of providing accommodation for the students of an institution within an academic community creates varied settings for social interaction and development. It also brings together students from different academic, cultural, racial, gender, social and economic backgrounds (Slessor, 1997, in Egwuom. 2010). Residential facilities that are amply designed not only encourage mutual interests but enable students obtain their desired educational outcomes emphasised (Hassanain, 2008). The researcher further reiterated that proper residential facilities provide cooperation, security, responsible citizenship, intellectual stimulation, mutual composition and inspiration to the student populace. Zahran (1972) states that the said systems help to widen the knowledge of a student on other disciplines as well as ensuring contacts with roommates in other specialisations.

Ubong (2007) stated that students who have resided in hostels as provided by the institution can testify to the following benefits accrued to them which are not limited to;

a) Facilitated reading/ learning
b) Co-curricular activities
c) Security
d) Moral training

e) National integration

f) Private relationships

g) Pupil Personnel Management

2.9 POE Protocols

2.9.1 BREEM

BREEAM (Building Research Establishment Environmental Assessment Method) is an environmental assessment tool for benchmarking and measurement of the performance of buildings. BREEAM has been used as the benchmarking tool for recent POE studies conducted in the UK. The tool covers a wide range of environmental issues namely the management, health and well being, energy, transport, water, materials, land use and ecology, and pollution (Saiful and Norhati, 2010).

2.9.2 AUDE

The Association of University Directors of Estate (AUDE) and Higher Education Funding Council for England (HEFCE) in 2006 published the 'Guide for Post Occupancy Evaluation'. It was developed as guidance for good practice for use by the Higher Education Sector. It can be used for auditing the construction process, reviewing occupation approach, ensuring delivery of quality design, monitoring of building performance and even reviewing and adapting of strategic design process.

The origin of the guide and toolkit began in 2000 when Higher Education Design Quality Forum (HEDQF) offered a proposal to the HEFCE to develop a POE review process in order to encourage good building design and allowing others learn from the process. A critical review of the different available approaches was carried out and a guide was developed.

In due course the construction industry's influence promoted initiatives such as 'Latham and Egan are shaping the mode of procuring, managing of design and consequently construction work. In a more recent scenario however, what was referred to as the "student experience' highlighted the need for good quality, useable space and memorable design. All these stand points which merged into developing and operation of buildings in a more efficient way, with due consideration to the 'whole life' of the building as part of its strategic management of estates and the success of its business function of the University (Saiful and Norhati, 2010)..

'This approach to POE recognised the need for developing harmony between the business aspirations of the institution and the ability/agility of the estate to support it' (Higher Education Funding Council for England, 2006)

This guide uses the term 'POE' as a comprehensive term that entails a review of the process of delivering the project as well as a review of the technical and functional performance of the building during occupation.

The stages of review being;

i. Operational Review (3-6 months after occupation)
ii. Project Review (12-18 months)
iii. Strategic Review (3-5 years after occupation)

a. Who needs to be involved and issues to consider

Depending on the focus of the POE, different people need to be involved, the reason being;

i. To obtain the necessary information from them-different types of information come from different people
ii. To make them feel confident that issues are being addressed
iii. To carry out the evaluation.

b. Levels of evaluation

i. Indicative review- giving a quick snapshot of the project

ii. Investigative review- more thorough investigation using more rigorous techniques to produce more robust data

iii. Diagnostic review- very thorough analysis that link the physical performance to occupants' response.

c. Framework of POE

a) Process performance- covers briefs, Procurement, design, construction, commissioning process and occupation.

b) Functional performance- covers strategic value, aesthetics and image, space, comfort, amenity, serviceability and operational management.

c) Technical performance- covers physical systems, environmental systems, adaptability and durability

As shown in figure 2.4 based on the POE framework to be carried out, it shows a collection of approaches that can be adopted depending on the level of evaluation required.

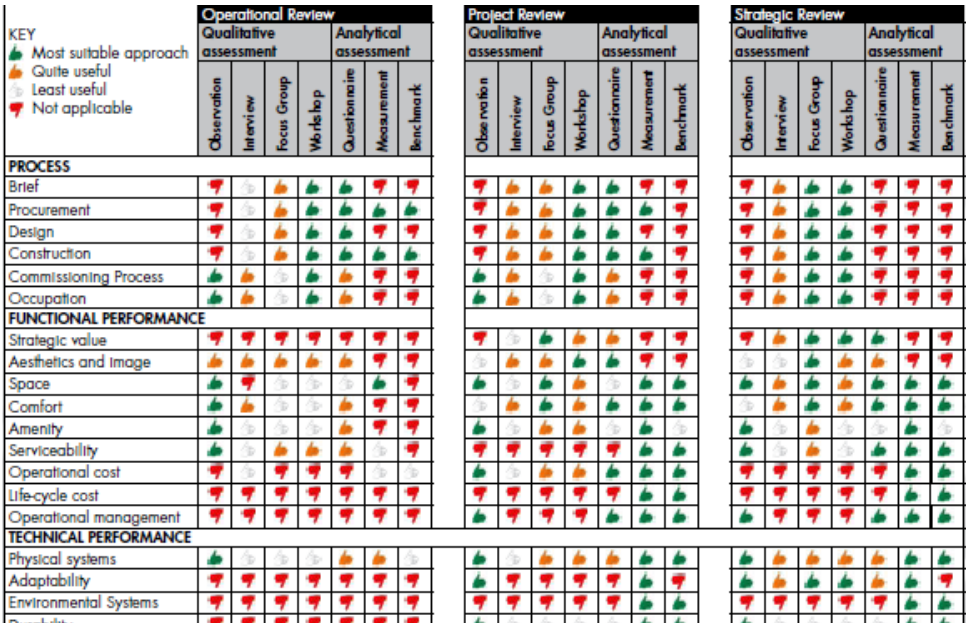


Figure 2.4: Selection Chart for carrying out POE
Source: HEFCE, (2006)

The AUDE toolkit consisted of the following tools and techniques

I) Structure of the building brief
II) Statement for project brief/Terms of Reference
III) Evaluation techniques
    a) Walkthrough and observation
    b) Interviews
    c) Focus groups
    d) Workshops
    e) Questionnaire
    f) Measurement
IV) Benchmarking
V) Preparing and Abstract for publication
VI) Preparing a report for publication

2.9.3 Survey by the Centre for the built environment (CBE)

This Survey was developed by the Center for Built Environment at UC-Berkeley (CBE*)*. It seeks for information on topics that include – general respondent's profile, their satisfaction with specific building features, the layout of their workstation, visual condition, privacy, office furnishings, thermal comfort, air quality, lighting, acoustic, cleanliness and maintenance and cleaning services. This particular survey form is used in Canada and for projects funded by the Cascadia Region Green Building Council (Saiful and Norhati, 2010).

2.9.4 Post-Occupancy Review of Buildings and their Engineering (PROBE)

Having started in the year 1995 as a venture the Probe (Post-Occupancy review of Building and their Engineering) process was unique to three different parties namely the United Kingdom government, a publisher and a research team. The major aim of this venture was to undertake post occupancy surveys of commercial and public buildings with an occupancy life span of 2-3 years (Saiful and Norhati, 2010)

Probe was developed to provide feedback for successful building design. These feedbacks were to be on generic and specific information like constructions, operations and use of the buildings with specific emphasis on areas of difficulty and disappointments (Cohen *et. al*, *2*001). These activities listed were executed in form of a process which comprised methods used and which provided a window for further development and research. With this in mind, building maintenance was later seen as a key to obtaining the best in the performance of any building.

It is a known fact that all buildings are constructed for a specific purpose- shelter. However, recent buildings are now catering for a variety of functions. To achieve this, buildings now struggle to maintain an effective state in order to meet its varying requirements as proposed in its design. However, a very demanding task, researches conducted in different parts of the world developed the concept of POE and thus the PROBE process which is a perfect example of assessing these buildings in order to meet the requirement (Jaunzen *et. al*, 2002)

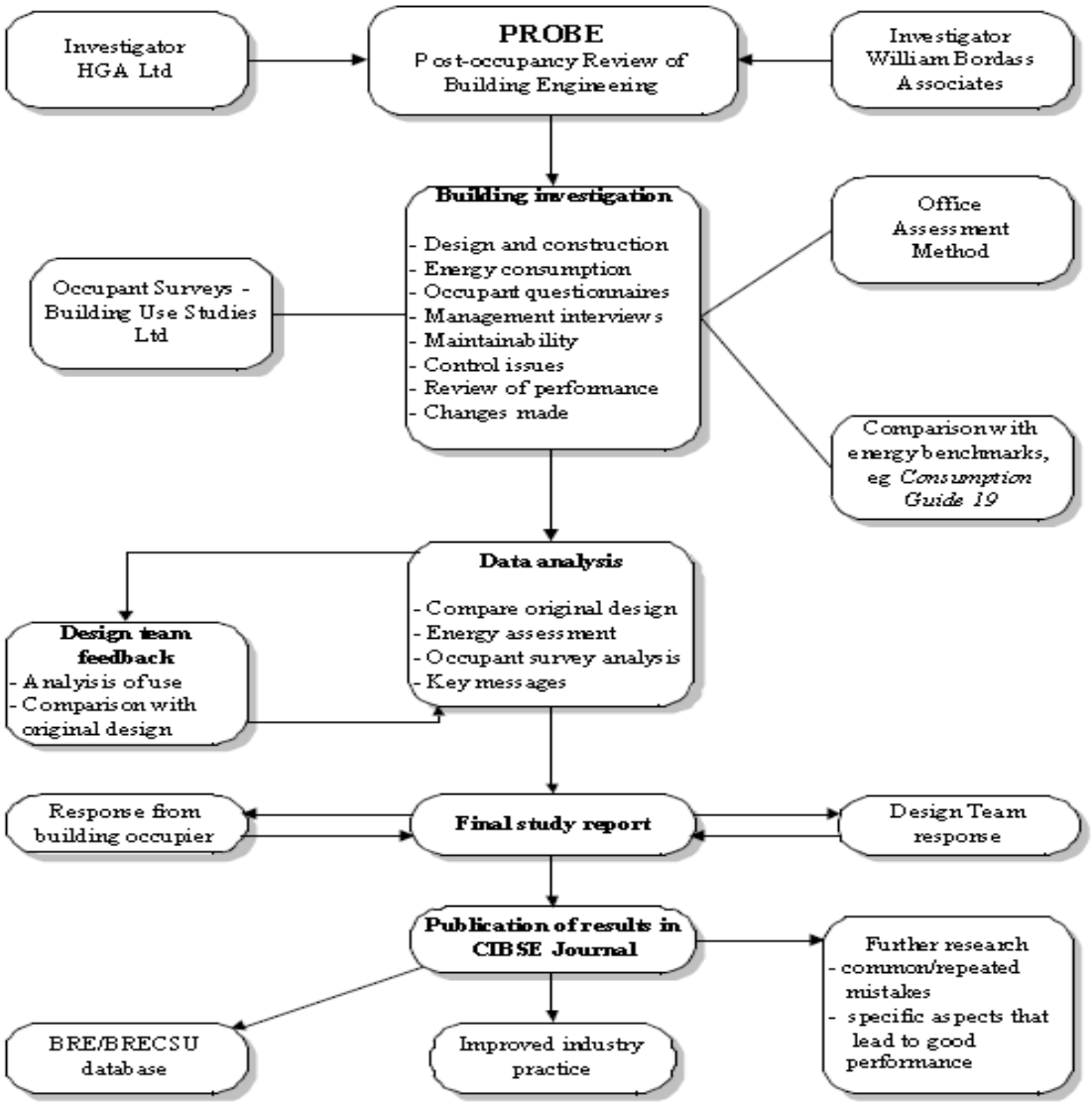


Figure 2.5; Outline of the process used in Probe 1
Source: www.usuablebuildings.co.uk

The original proposal of Probe 1 incorporated two existing tools which are

i. The occupant survey method developed by Building Use Studies (BUS) to gauge the levels of occupant satisfaction with the internal conditions, their control and management

ii. The Energy Assessment and Reporting Method (EARM) in the form of the prototype Office Assessment Method (OAM) for the analysing of energy use in the building.

Both of the methods were respectable. The BUS that was developed for the Probe purpose evolved from studies undertaken by BUS to investigate the sick building syndrome during the 1980s. These were subsequently reviewed and incorporated in the standard procedure

The scope of each investigation carried out was to carry out an assessment that covers a full range of post-occupancy issues stated by Cohen *et al,* (2001) and are as follows;

i. design integration
ii. the effectiveness of the procurement
iii. methods of construction, installation and setting to work
iv. initial occupation of the building and, in particular, testing commissioning handover, fit-out and move-in
v. any unexpected requirements, changes and teething problems

At the end of each investigation, the investigators identify key messages and compare each building performance with similar building and current best practices in energy performance and occupant satisfaction. These ,they stated will help the engineers, architects and clients to further build upon good features, avoid those that are not helpful and improve upon those that have shown potential for further development.

Since its introduction, the developer of the PROBE questionnaire has simplified the questions so as to make the exercise less taxing and could be carried out in a period of 4 to 10 minutes (20 questions, in 2-page length). Respondents are required to answer according to a 7 point scale (Saiful and Norhati, 2010).

2.10 The Nigerian Academic Environment

University education in Nigeria goes all the way back to 1948 with the creation of the University College Ibadan (okebukola, 2006). A few years after independence however, the

country had 5 universities, with each region boasting of their own while the then 'western' region had three. With the increase in oil revenues, combined with the need to foster national unity at the end of the civil war motivated the creation of a national system of higher education (Okebukola, 2006).

Over the past three decades, there have been significant changes within the university system in Nigeria. Worthy of note of such changes are the increase in the number of universities and programmes offered in these institutions (Okebukola, 2006). Furthermore the researcher opined that the greatest change by far, has been the population explosion of students' and the number of 'hopefuls' seeking university education. Consequently, it has put tremendous demand on the universities and the available physical facilities that have over time had limited expansion.

On the 'reforms in University Education in Nigeria', Okebukola, (2006) stated that there are five main challenges facing Nigerian Universities in recent times are; Funding, Quality, Access, Relevance of Programmes and University Governance and Management. These challenges thwart the potential of the universities to play a part in the Social and Economic development of the country through the advancement and application of knowledge.

To alleviate the problems caused by insufficient funding to the higher institutions, a policy was formulated to get the private sector involved in the provision of hostel accommodation through the participation in the University Hostel Development and Management Initiative introduced in 2001.

In more standardized academic communities, hostels in the form of dormitories, residential halls and bedsitting (Okebukola, 2004) are the forms of residential accommodation developed for students. (Ubong, 2001), however bewails the fact that hostel accommodation is not given the necessary attention in the Nigerian tertiary education institutions.

2.11 Summary of Review

From the review of Literature, the study was able to establish the concept and theories involved in Post Occupancy Evaluation. From the review, protocols were hardly tailored specifically to housing function of school buildings. In addition, the reviewed protocols gave little precedence for the feedback of stakeholders in their design. Through this study of literature, it was established that there is a need to involve stakeholders in evaluating the effectiveness and functional performance of the building. Thus this set the pace for the empirical framework of the research. From the AUDE protocol studied, tools identified proposed an effective way of assessing the feedback of stakeholders in the facility under study. Thus, the next chapter will outline the methodology in trying to develop a Post occupancy toolkit based on the feedback of stakeholders in the hostel facility.

3.0 RESEARCH METHODOLOGY

3.1 Research Design

Any successful research largely depends on the appropriateness of its methodology. This clearly states the procedure carried out to achieve the research aim and its objectives. According to Fellows and Liu (2003), the methodology clearly answers the question “how” in a research.

As stated previously, the research sought to tackle the problem of post occupancy evaluation in on-campus student housing facilities in Nigeria. As a result the research came up with the problem statement: how can all user groups be included in the post occupancy evaluation of on-campus student housing facilities in Nigeria? Thus in line with the recent global practices, which is the use of post occupancy evaluation, the research proposed a development of a Post Occupancy Evaluation toolkit to assess the needs of the building users and thus encourage good building design of on-campus student housing.

The research set out to answer the question, "How adequately can on-campus student housing facilities be evaluated in Nigeria?” Recently, it has been established that evaluation of existing buildings also known as Post Occupancy Evaluation is a common phenomenon used and practiced in many areas worldwide. However, it is relatively new to the developing countries like Nigeria (Yewande *et al.,* 2011).

3.1.1 Rationale for the methodology/philosophical backing for research

According to Newman (2009), undertaking any research requires the consideration of the appropriateness and validity of the methods and techniques that are to be adopted. It was highlighted also that the issues for consideration are the type of data required, how it is to be gathered, what method of analysis are to be adopted and of great importance at all stages in

the development of the methods is whether the methods are the most appropriate to answer the research question.

In most research endeavours, methodologies have been classified as either qualitative or quantitative. However, contemporary research has been able to harmonise the two (2) methods in order to adopt a less rigid approach; producing more reliable results. For example, the concept of triangulation by Olsen (2004), where the validity of the research was tested through variety of data types leading to the mixed techniques methodology in many social science researches.

It is with this in mind that the research adopted a social constructionist perspective. Gregen and Gregen, (2008) clearly defined Constructionism as "*A tradition of scholarship that traces the origin of knowledge and meaning and the nature of reality to processes generated with human relationships*". In addition, Crotty (1998) postulated that "all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context"

This standpoint has significant implications for traditional research methods, both in questioning their authority and in opening up new possibilities, especially in the domain of qualitative inquiry.

Although social constructionists concede that more than one account of reality exists, they concur with post-modernists in maintaining that all accounts are not equally valid. On the word of Doan (2000) some accounts are not respectful of gender, ethnicity, race or religion therefore Neikerk (2005), opined that social constructionists prefer accounts based on persons' encounter rather than on expert knowledge. Doan (2000) further stated that social constructionists are concerned with accounts that honour and respect the community of

voices characteristic of each individual and how these accounts can be respected within a particular system.

These fundamental assumptions of social constructionism form the epistemological basis for this research. Newman (2009) concedes that as a result, meaning is given by human beings through their interactions and daily encounters with the world. However, this may vary radically across time, location, cultures, groups and individuals.

The aim of the POE toolkit developed by this research was to amply assess end user satisfaction of students' on-campus housing by making it possible that the voices of all the stakeholders were heard regarding the reality of the on-campus students' housing.

The taking on of this constructionist stance has informed the development of the methodology in this research. In this research "other" voices such as those of students, caretakers, cleaners, porters that have been frequently overlooked as unimportant in research as well as in providing input to design were regarded as of equal significance as to the more "powerful" stakeholders such as the management (Hall Administrators or Assistant Hall administrators) and Building designers (Architects, Quantity Surveyors, Builders)

3.2. Research Methods

The principal consideration in the design of any study, including the choice of method, is to design a methodology that bests answers the research question**.** In this situation, **how all user groups can be included in the evaluation of on-campus student housing facilities in Nigeria?** This question led to the development of the methods used in this study.

The preceding section proposed the philosophical foundation of the research including an elucidation of the social constructionist approach. This section will present a thorough description of the stages in the research and grounds for the methods adopted. Consequently

the research was conducted in four (4) stages that were tailored to achieving the objectives of the research. The stages were as follows:

i) Desk Research/ Literature Review
ii) Field Survey: consisting of observation, semi-interviews and Questionnaires.
iii) Developing of the POE toolkit for on-campus housing

3.3 Desk Research/ Literature Review

This stage in the research involved an in-depth study of the background of POE; its history and concept. It was important to highlight the origin of POE as it formed the basis and justification for carrying out this research. This literature review established a strong relationship between the construction industry, management, POE and its development. The Review of literature helped understand the different types of toolkits available and brought also to light that toolkits were developed according to building types and use. It was also noted that the development of POE was spurned by environmental psychologists who were concerned with the physical surroundings, debunking the fact that POE is more technical than social (Cooper, 2001). Beyond that, the review was also able to link the improvement and adhering to user requirement as not only one of the major drivers in POE development (Whyte and Gann, 2001) but an important benefit of POE. The review established from literature areas that the POE toolkit would evaluate and also the far reaching benefits accrued to developed countries from POE, its advancement in some developing countries and the lack thereof in Nigeria.

3.4 Field Survey

3.4.1 Study area

Ahmadu Bello University is the largest University in Nigeria and second largest in Africa, second only to Cairo University Egypt (Wikipedia, 2013). Its' On-Campus Undergraduate Hostels are in eight (8) clusters, five (5) of which are for only Male students, two (2) for the

female students and one (1) that is for both male and female. The study area is the two female students' hostel known as Queen Amina and Alexander/Ribadu halls of residence. Each cluster consists of several housing blocks with majority of the rooms designed to accommodate two occupants at a time; at one hostel, the rooms are designed for up to four students. For this research a Random Cluster Sampling technique was used to select the respondents of this survey from every hostel wing and floor consequently. This sampling method was chosen according to methods used by Lam et al. (1998); Adamchak et al. (2000); Burton et al. (2005) and Najib et al. (2011) because the respondents are already "naturally" clustered into groups(that is by block, hostels and gender).

3.4.2 Sample population

As far as the scope of this research endeavour is concerned, it would have been unfeasible to carry out an in-depth qualitative research on all the users in all the higher institutions available in Nigeria. Therefore, an institution was selected as a case study of all the public universities; being a first generation Federal University and truly representative of the Nigerian society.

Wilmot (2004) stated that "With purposive non-random sampling, the number of people interviewed is less important than the criteria used to select them". He opined that the characteristics of the individuals are used as the basis of the selection, most often chosen to reflect the diversity and breadth of the sample population. Ahmadu Bello University was selected as a consequence of a purposive sampling strategy.

As stated previously, the user groups included the students, visitors, management and maintenance staff of the students' On-campus housing. These, according to this research were sources that hold significant share in the effective running of the research.

I. Student Sample

II. Visitors Sample

III. Management and staff of the hostel facility.

As formerly stated the research was limited to the female On-campus housing facilities, due to the fact that it would have been unsettling for the researcher to observe the male occupants in their element and at unconventional hours. This circumstance influenced the selection of the on-campus housing not just for convenience alone but also for the authenticity of the research.

Also earlier stated, of the seven clusters of hostel facilities, five (5) are for male students and two (2) for female and one (1) that is a mixture of both male and female students. The research adopted a Random Cluster Sampling technique to select respondents of this survey so that every hostel block, wing and floor was duly represented. This sampling method is grounded in literature as applied by Lam *et al.* (1998); Adamchak *et al*. (2000); Burton et al. (2005) and Najib *et al.* (2011) because the respondents are already naturally clustered into groups (that is by hostels, blocks and gender).

3.4.3 Sample size

I) Student Sample

The population of students in Alex/Ribadu Hall and Amina hall is 1325 and 2104 respectively (A.B.U, 2013). Therefore the population of the halls under study is 3429.

A Student user size of 375 was obtained using: **ss=** $\frac{z^2 p(1-p)}{d^2}$ ……(3.1)

Correction for finite population= $\mathbf{SS} = \frac{\mathbf{ss}}{1+\frac{[\mathbf{SS}-1]}{\mathbf{pop}}}$ .....(3.2)

Where;

ss= sample size, and SS= new sample size.

P = True proportion of factor in the population, or the expected frequency value

D = Maximum difference between the sample mean and the population mean, Or Expected Frequency Value minus (-) Worst Acceptable Value

Z = Area under normal curve corresponding to the desired confidence level. For the purpose of this study, a confidence level of 95% was adopted.

Z= 1.96, P=0.2, 1-P=0.8 and D= 0.04

Hence,

ss= $[(1.96)x0.2x0.8]/.04^2$= 384.16

Correction for finite population therefore is; applying

$$New\ SS = \frac{SS}{1 + \frac{[SS - 1]}{pop}}$$

New SS=345.55, approximated as **346 students.**

II) Visitors Sample

Due to the variability of the visitors' population to the hostels, purposive sampling was employed. The visitor population involved in this research was selected based on the "first come first draft" basis as no criteria were used besides the fact that there were not student resident of the hostel under study, workers nor management staff. Their stay was brief and their input to the research was considered equally necessary as there would be experiencing and interacting with the facility however brief their sojourn was. The security personnel assisted in distributing the structured

questionnaires to the visitors and a total of 24 visitors responded with 20 of the questionnaires valid for analysis.

III) Hostel Management Sample

The management of the hostel within the study area include; 3 Hall Administrators and 3 Assistant Hall Administrators for Amina, Ribadu and Alexandra halls respectively. This hostel management have a staff workforce consisting of 7 porters, 6 Matrons, 1Housekeeping, 5 Hall supervisors and 4 Assistant Hall Supervisors together with cleaners, carpenters, plumbers, electricians and security staff. The management of the hostel, caretakers, porters, and hostel staff were involved in this research endeavour as their opinions were likewise significant. A total of nine staff; three of which were hall administrators, four hall supervisors and two porters was available to participate in the study.

3.5 Data Collection Techniques

i. Observations

The research adapted the Association of University Directors of Estate (AUDE) Observation Evaluation tool which now addressed specific interactions within the hostel facilities. A sample of the adapted observation sheet can be seen in Appendix1.The researcher through this medium reflected on how the spaces under consideration were performing, to observe the different interactions between the users and the facilities and to have informal discussions with the users in the on-campus housing. It was done without any stakeholder involvement or inconvenience. It enabled an unbiased view, provided the researcher with hands-on experience and gave credence to the issues raised from literature combined with the responses gleaned from the stakeholders.

In drafting out the observation sheet, besides considering the spaces, purpose and activity of the room/space surveyed, the research identified five (5) basic interactions present in the on-campus housing facilities. These interactions were based on the users and facilities identified in the building. These were identified as Student-Student interaction, Student-Facility interaction, Management-Student interaction, Management-Facility interaction, Hostel-staff-Facility interaction.

These interactions stated above aided the research in easily studying the subjects and in categorising the data obtained in the process.

As stated previously, the literature review played a major role in gleaning out specific themes for evaluating the needs of students in an on-campus housing facility. With these in mind, the research through the observation of the interactions set out to buttress the already identified themes or identify new ones specific to the Nigerian environment.

From the observation, which was based on 5 major interactions, themes were clearly identified by the research, some of which buttressed themes obtained from literature. Observation of the students and staff of the facility occurred throughout the day during their daily activities within their rooms, corridors, passages, hallways and so on. To cater for all interactions observed in the facility, the themes used in assessing stakeholders were divided into two (2) major categories namely

i. Strategic value/ School Ethos
ii. Functional Performance of the facility.

These themes were strictly related to the design consideration of the building as captured in the scope of the research. A list of the factors considered in each theme is shown clearly in table 3.1;

Table 3.1: Relevant factors and themes considered in assessing users perception in hostel facility.

Strategic value/ School Ethos.	Academic performance	**Functional Performance of the facility**	Adequacy of space
	Fostering Mutual interest		Environmental Quality (Ventilation, Acoustics, Lighting and Odour)
	Intellectual Stimulation		Aesthetic appeal
	Inspiration		Routine Maintenance
	Institutional Loyalty		Privacy
	Providing Cooperation		Serenity
	Responsible Citizenship		Comfort
	Student Awareness (knowledge of other discipline other than your own)		Health and Safety
	Contact with others (roommates of different background and specialization)		Population density
	Security		Handicapped accessibility
	Unity among student populace		Extra Facilities
	Developing Personal Character		Support Facilities

Source: Researcher, 2014.

The observation recorded specific examples on how the built environment impacted on the interaction of students that reside in the facility and the way the staff worked at different times of the day. These observations then formed the basis of the interviews and the themes that constituted the questionnaires that were developed for the students, visitors and hostel management staff. A detailed account is discussed in chapter four

iii. Questionnaires

A survey was carried out using well structured questionnaires which was distributed face to face to the student respondents randomly on every floor of every hostel block. This was to collect data on the required functional performance of hostel facilities from the student users of on-campus housing and to know what was most important to them in order to achieve satisfaction with the facilities. The themes used in designing the questionnaire were established from literature and from the observation and semi-interviews conducted in the hostel facility.

iv. Interviews

Newman (2009) stated that an effective way of evaluating buildings is by assessing the input of the building stakeholders and urged that the stakeholders stand at a vintage point to highlight correctly the issues affecting the building. It was on this premise that the interviews were carried out. The interviews were conducted on three hostel management staff (Hall administrators and Assistants), 6 hostel staff; porters, hall supervisors and assistants, and some students. The interviews were conducted on the Hall administrators (Amina, Ribadu and Alex), who were informed ahead of time, the porters who were able to participate were also interviewed after their shifts as well as the hall supervisors. Some of the hostel staff could not participate due to their schedules and three others were unavoidably absent because of an emergency in the hostel. The interviews questioned further the extent to which the facility was fit for its purpose. Interviews were tape recorded, transcribed and coded into themes that appeared repeatedly throughout the interviews. The interviews with staff took a semi-structured method and lasted about 30-35 minutes. The interviews with the users were based on the themes that emerged during the period of observation.

3.6 Analysis of Case Study Data

For the quantitative approach via the Questionnaires administered to the student users; The data collected was analysed using the Statistical Package for the Social Science (SPSS); both descriptive and inferential data analyses was used. The results were expressed using Tables, means, and percentages where necessary

I. Relative importance index (RII)

Relative importance index was used in the study to rank what is most important to the users relating to design factors with respect to the hostel facility. The analysis was carried out for each user group namely Students, Visitors, Hostel management.

$$\text{RII} \frac{\sum fx}{\sum f} \times \frac{1}{k} \quad \text{.....(3.3)}$$

Where,

$\sum fx$= total weight given to each factor by the respondents

$\sum f$= total number of respondents in the sample

K= highest number on the Likert scale.

The design factor or item under consideration with the highest RII value is ranked first position, the next follows as second and so forth.

Adopting Mbamali and Okotie (2012), interpretation of RII values as follows:

RII<0.60 as low significance

0.60≤RII<0.80 as high significance

RII≥0.80 as very high significance.

For the Qualitative approach via the observation and Interviews; The data obtained from the period of observation and interviews carried out were analysed thematically.

II. Thematic analysis

This method was used to identify, analyse and report patterns (themes) within the data. These themes captured the aspects about the data that stood out in relation to the research question

and represented some level of patterned response or meaning within the data. This process sought out patterns as the researcher read and reread the data in order to gain intimate knowledge of the data and establish lists of recurrent themes. Close attention was given to transcribing data and interpretation to analyse data. Throughout the data analysis phase, copies were made of the transcribed interviews and observation reports and annotations were made as continued patterns were observed in the form of repeated areas of concern. This process, lead to the production of the initial coded data. The next stage in the analysis after all data have been initially coded and collated involved sorting the different codes into potential themes, the themes were defined and refined as some initial candidate themes were not really themes collapsed into each other. The themes were finally grouped and named.

3.7 Developing of the Post Occupancy Evaluation toolkit

The design of the toolkit was predicated on the fact that all user groups were to be equally considered. To also avoid bias in the answers, the toolkit was designed to address specifically the group and the areas directly concerned with them. ‘All voices are regarded as equal value providing they are asked questions that are relevant to their roles in the school’ (Newman, 2009).

The post occupancy toolkit is in the form of a questionnaire with the intent to gauge the judgements or opinion of the stakeholders and as such, a Likert scale was adopted. It would make statements concerning various aspects of the hostel facility to which the respondent would select on the scale the degree to which the statement was supported. It is important that the statements were as impartial as possible so as not to lead the respondent in any way.

Stakeholders / diversity of Voices

In the course of the research, as the process of the observation was carried out and students were interviewed and asked to comment on the matters that arose, it became apparent that the perspective of all the different groups or stakeholders should be represented. The hostel

facility is experienced by all stakeholder groups and as such, a method of evaluation be designed to capture all of them.

The interviews were conducted not only with the management of the hostel (Hall administrators) alone but with the assistants, porters, hall supervisors, and students.

A post-occupancy toolkit was therefore specifically developed for the hostel facility and focused to each user group. This would allow for every stakeholder's opinion to be captured and fed into the design process.

This is therefore the 'test' of a designer, to not only consider one set of voices/ groups, but to give due consideration to the array of stakeholders and design a facility that meets the needs as much as possible of all parties concerned.

4.0 DATA PRESENTATION AND ANALYSIS

4.1 Preamble

The research aim was to develop a suitable POE toolkit to adequately assess end-user satisfaction of on-campus student housing facilities, specific to the Nigerian Environment. The question this study set out to answer was **'How all user groups can be included in the evaluation of the on-campus student housing facility in Nigeria'?** In order to achieve this, the research developed an evaluation method which took into consideration all stakeholders/ user groups. Three objectives were outlined to aid in achieving the aim. These objectives were to articulate concepts and related strategies of existing POE toolkits, to establish key areas and issues the POE would evaluate specific to the Nigerian environment, and to develop a POE toolkit for evaluating student's on-campus housing facilities. With this in mind, the research used four stages to accomplish these objectives. They included a review of existing literature, observations of key areas of the facilities under study, Questionnaire distribution, and focus group discussions/interviews of key management staff and workers of the facilities.

Following that, this chapter sets out to discuss the findings of the empirical research conducted in chapter three of this research. The discussion is based on the chronological stages as carried out by the research. By conducting the in-depth case studies of two of the female housing facilities in Ahmadu Bello University many concerns as well as what were considered most important to the stakeholders were brought to light. The extent of the hostels ability to meet the needs of its users was addressed in the interview with hostel management and students through an investigation of specific examples of where the hostels contributed to the functioning of the school or whether it impeded or prevented certain activities. The themes and concepts that emerged from the observation and interviews are treated in a context specific way as related to the spaces within the facility.

4.2 Responses of Students

Table4.1; Frequency of student Respondents at different Levels

Level	frequency	%
100	81	24.40
200	103	31.02
300	62	18.67
400	46	13.86
500	7	2.11
600	4	1.20
Others	29	8.73
Total	**332**	**100.00**

Source: Field Survey (2014)

Table 4.1 illustrates that the questionnaires were randomly distributed to all the levels of undergraduate students with 8.73% of the population being postgraduate students. Table 4.1 represents the different levels of students in the institution enabling the research obtain an all-inclusive feedback. 24.40% of the sample population were first level students enriching the research by the fresh perspective presented by them.

4.2.1 Physical challenge of Student Respondents

Table4.2; Profile of physically challenged Students

Options	Frequency	%
Yes	12	3.61
No	320	96.39
Total	**332**	**100.00**

Source: Field Survey (2014)

It can be seen from Table 4.2 that 3.61% of the student respondents' population are physically challenged (PC). This shows that a majority of the respondents are able-bodied.

Table4.3; Nature of Disability of Physically challenged students

Options	Frequency	%
Blind/Partially sighted	2	16.67
Deaf/Hearing Impaired	2	16.67
Physical Disability	6	50.00
Others	2	16.67
Total	**12**	**100.00**

Source: Field Survey (2014)

Table 4.3 demonstrates that of the physically challenged (PC) population, 16.67% are blind/partially sighted and deaf/partially impaired respectively. Greater parts of the PC population possess one form of physical disability while 16.67% of the challenged population possess other forms of challenges.

4.2.2 school ethos/strategic value

This section addresses how well the building supports the institution's organisational goals and aspirations and how well the user needs are supported.

Table 4.4; School Ethos/Strategic Value and student Needs

Needs	Importance Level						Total	Mean	RII	Position
	Frequency of Response									
	1	2	3	4	5	∑f	∑fx			
Academic Performance	25	11	40	94	162	332	1353	4.08	0.82	2nd
Fostering Mutual Interest	13	25	100	132	62	332	1201	3.62	0.72	11th
Intellectual Stimulation	12	25	102	116	77	332	1217	3.67	0.73	9th
Inspiration	17	30	98	123	64	332	1183	3.56	0.71	12th
Institutional Loyalty	14	28	86	128	76	332	1220	3.67	0.73	9th
Providing Cooperation	17	24	74	128	89	332	1244	3.75	0.75	7th
Responsible Citizenship	20	19	88	98	107	332	1249	3.76	0.75	7th
Student Awareness	18	18	59	126	111	332	1290	3.89	0.78	4th
Contact with others	14	8	54	114	142	332	1358	4.09	0.82	2nd
Security	17	12	50	84	169	332	1372	4.13	0.83	1st
Unity among Student Populace	13	18	64	126	111	332	1300	3.92	0.78	4th
Developing Personal Character	17	22	58	107	128	332	1303	3.92	0.78	4th

Source: Field Survey (2014)

Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.4 revealed that there was unanimity of respondents' opinion as regards the part hostel facilities should play in meeting their needs as students. All outlined needs were considered to have high significance i.e. extremely important as they all had RII's that were greater than 0.60. The following needs; fostering mutual interests, intellectual stimulation, inspiration, institutional loyalty, providing cooperation, responsible citizenship, awareness of other disciplines, unity among student populace and developing personal character fall within the range $0.60 \leq RII < 0.80$ connoting they were considered extremely important. In first position is security (RII=0.83) indicating that students considered it the highest priority in the hostels. This does not come as a surprise judging by the present state of insecurity in the nation. Following closely in second position are the needs; Academic performance and contact with others both with RII of 0.82 respectively.

4.2.3 Functional performance requirements

Table4. 5; Relevance of Adequacy of Space in Hostel Facilities

facilities	**Importance Level**					**Sum**	**Total**	**Mean**	**RII**	**Position**
	Frequency of Response									
	1	2	3	4	5	**∑f**	**∑fx**			
Room	24	11	24	55	218	332	1428	4.30	0.86	1st
Restrooms	26	24	54	84	144	332	1292	3.89	0.78	3rd
Laundry	22	26	72	96	116	332	1254	3.78	0.76	5th
Staircase/Corridor/Hallways	22	26	97	97	90	332	1203	3.62	0.72	7th
Common Rooms	16	20	100	124	72	332	1212	3.65	0.73	6th
Cafeterias	12	16	91	101	112	332	1281	3.86	0.77	4th
Stores	29	26	94	96	87	332	1182	3.56	0.71	8th
Physical Environment	16	7	41	101	167	332	1392	4.19	0.84	2nd

Source: Field Survey (2014)

Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.5 establishes that adequate space is regarded as essential by the students in the hostel facility underscored by the RII's ranging from high significance ($0.60 \leq RII < 0.80$) to very high significance ($RII \geq 0.80$) in all the spaces. The rooms ranked first with RII=0.86, in second place physical environment with RII=0.84 and in 8th position was stores with RII=0.71.

Table4.6; Relevance of Environmental Quality in Hostel Facilities

facilities	Importance Level							Total	Mean	RII	Position
	Frequency of Response										
	1	2	3	4	5	∑f	∑fx				
Room	16	15	36	65	200	332	1414	4.26	0.85	1st	
Restrooms	25	28	58	83	138	332	1277	3.85	0.77	4th	
Laundry	22	18	90	102	100	332	1236	3.72	0.74	6th	
Staircase/Corridor/Hallways	18	16	102	100	96	332	1236	3.72	0.74	6th	
Common Rooms	16	17	68	101	130	332	1308	3.94	0.79	3rd	
Cafeterias	11	17	86	110	108	332	1283	3.86	0.77	4th	
Stores	31	37	92	106	66	332	1135	3.42	0.68	8th	
Physical Environment	13	13	50	79	177	332	1390	4.19	0.84	2nd	

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.6 denotes that environmental quality- odour, ventilation and noise control are relevant in all the spaces within the hostel facility. Ranking first with the highest RII is the room (RII=0.85) and the least, ranking 8th are the stores (RII=0.68).

Table4.7; Relevance of Aesthetic Appeal in Hostel Facilities

facilities	Importance Level							Total	Mean	RII	Position
	Frequency of Response										
	1	2	3	4	5	∑f	∑fx				
Room	13	26	49	84	160	332	1348	4.06	0.81	3rd	
Restrooms	20	26	70	160	116	392	1502	4.52	0.90	1st	
Laundry	24	19	107	115	67	332	1178	3.55	0.71	7th	
Staircase/Corridor/Hallways	16	28	101	115	72	332	1195	3.60	0.72	6th	
Common Rooms	13	18	102	113	86	332	1237	3.73	0.75	5th	
Cafeterias	8	26	85	103	110	332	1277	3.85	0.77	4th	
Stores	26	49	103	90	64	332	1113	3.35	0.67	8th	
Physical Environment	11	16	52	102	151	332	1362	4.10	0.82	2nd	

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.7 illustrates the responses of the students as regards the level of importance of aesthetics in the hostel facility. As seen, it is considered relevant in all spaces within a hostel facility. A RII of 0.90 indicating its extreme importance for the restrooms was the highest score. Though also relevant, the least ranked space is the store with a RII of 0.67.

Table4.8; Relevance of Routine Maintenance in Hostel Facilities

facilities	Importance Level						Total	Mean	RII	Position
	Frequency of Response									
	1	2	3	4	5	∑f	∑fx			
Room	24	12	34	90	172	332	1370	4.13	0.83	2nd
Restrooms	18	22	53	77	162	332	1339	4.03	0.81	3rd
Laundry	12	28	71	90	131	332	1296	3.90	0.78	5th
Staircase/Corridor/Hallways	11	26	73	115	107	332	1277	3.85	0.77	7th
Common Rooms	13	14	86	106	113	332	1288	3.88	0.78	5th
Cafeterias	17	12	71	78	154	332	1336	4.02	0.80	4th
Stores	26	26	84	100	96	332	1210	3.64	0.73	8th
Physical Environment	13	12	29	92	186	332	1422	4.28	0.86	1st

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

On the matter of routine maintenance of the facility Table 4.8 shows that the students viewed it as very relevant. This is highlighted by the fact that four of the spaces have RIIs that signify very high significance or extremely important i.e. >0.80; physical environment (RII=0.86), Rooms (RII=0.83), rest rooms (RII=0.81), cafeterias (RII=0.80) and four assessed to have high significance i.e. 0.60≤RII≥0.80; Laundry (RII=0.78), common rooms (RII=0.78), staircases/ corridors /hallways (RII=0.77) and stores (RII=0.73).

Table4.9; Relevance of Privacy in Hostel Facilities

facilities	Importance Level						Total	Mean	RII	Position
	Frequency of Response									
	1	2	3	4	5	∑f	∑fx			
Room	30	17	43	58	184	332	1345	4.05	0.81	1st
Restrooms	31	22	66	76	137	332	1262	3.80	0.76	2nd
Laundry	37	43	126	71	55	332	1060	3.19	0.64	4th
Staircase/Corridor/Hallways	47	47	142	54	42	332	993	2.99	0.60	7th
Common Rooms	41	59	122	65	45	332	1010	3.04	0.61	6th
Cafeterias	44	48	108	72	60	332	1052	3.17	0.63	5th
Stores	50	67	106	61	48	332	986	2.97	0.59	8th
Physical Environment	48	43	80	68	93	332	1111	3.35	0.67	3rd

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.9 illustrates the impression of the respondents regarding privacy within hostel facilities as emphasised in the results presented. This subject of privacy is regarded as

extremely important in the rooms (RII=0.81) as proven by 184 respondents. On the other hand, it was considered of low significance in the stores (RII=0.59) as shown by the over 150 respondents that think so.

Table4.10; Relevance of Serenity in Hostel facilities

Spaces	Importance Level						Total	Mean	RII	Position
	Frequency of Response									
	1	2	3	4	5	∑f	∑fx			
Room	20	18	46	84	164	332	1350	4.07	0.81	1st
Restrooms	16	30	82	84	120	332	1258	3.79	0.76	3rd
Laundry	24	34	116	91	67	332	1139	3.43	0.69	6th
Staircase/Corridor/Hallways	28	36	128	78	62	332	1106	3.33	0.67	7th
Common Rooms	18	34	110	107	63	332	1159	3.49	0.70	5th
Cafeterias	20	35	94	92	91	332	1195	3.60	0.72	4th
Stores	30	46	102	100	54	332	1098	3.31	0.66	8th
Physical Environment	20	18	71	96	127	332	1288	3.88	0.78	2nd

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.10 is evidence to the level of relevance attached to serenity in hostel facilities. All the spaces in the facility scored a RII > 0.60. Students appreciate mostly in the room a serene environment as sustained by a RII=0.81.

Table4.11; Relevance of Comfort in Hostel Facilities

Spaces	Importance Level						Total	Mean	RII	Position
	Frequency of Response									
	1	2	3	4	5	∑f	∑fx			
Room	24	11	36	48	213	332	1411	4.25	0.85	1st
Restrooms	18	23	40	78	173	332	1361	4.10	0.82	2nd
Laundry	28	28	86	100	90	332	1192	3.59	0.72	6th
Staircase/Corridor/Hallways	31	37	102	88	74	332	1133	3.41	0.68	7th
Common Rooms	13	19	89	107	104	332	1266	3.81	0.76	5th
Cafeterias	9	22	67	108	126	332	1316	3.96	0.79	4th
Stores	47	41	95	83	66	332	1076	3.24	0.65	8th
Physical Environment	13	22	48	82	167	332	1364	4.11	0.82	2nd

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Being comfortable in student housing is regarded as essential by the respondents proven by the RII scores over 0.60 in all spaces in the hostel facilities. This can be seen in Table 4.11.

The respondents also accorded the highest significance/extreme importance to comfort in the rooms, followed closely by the restrooms and physical environment with RII's 0.85 and 0.82 respectively.

Table4.12; Relevance of Health and safety in Hostel Facilities

Spaces	Importance Level						Total	Mean	RII	Position
	Frequency of Response									
	1	2	3	4	5	∑f	∑fx			
Room	19	13	22	52	226	332	1449	4.36	0.87	1st
Restrooms	28	16	29	67	192	332	1375	4.14	0.83	3rd
Laundry	22	30	55	66	159	332	1306	3.93	0.79	6th
Staircase/Corridor/Hallways	18	26	71	79	138	332	1289	3.88	0.78	7th
Common Rooms	14	22	59	90	147	332	1330	4.01	0.80	5th
Cafeterias	13	17	46	83	173	332	1382	4.16	0.83	3rd
Stores	25	24	72	90	121	332	1254	3.78	0.76	8th
Physical Environment	12	14	38	70	198	332	1424	4.29	0.86	2nd

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

With all of the spaces having RII's >0.60 and five spaces having RII's ≥0.80 shows in Table 4.12 how highly pertinent the subject of health and safety is to the hostel facility. As stated the rooms, physical environment restrooms, cafeterias and common rooms scored highest with RII's 0.87, 0.86, 0.83, 0.83 and 0.80 respectively.

Table4.13; Relevance of Population density in Hostel Facilities

Spaces	Importance Level						Total	Mean	RII	Position
	Frequency of Response									
	1	2	3	4	5	∑f	∑fx			
Room	41	16	36	64	175	332	1312	3.95	0.79	1st
Restrooms	30	17	58	89	138	332	1284	3.87	0.77	2nd
Laundry	22	41	101	95	73	332	1152	3.47	0.69	6th
Staircase/Corridor/Hallways	26	42	133	74	57	332	1090	3.28	0.66	7th
Common Rooms	22	28	102	106	74	332	1178	3.55	0.71	5th
Cafeterias	24	30	92	95	91	332	1195	3.60	0.72	4th
Stores	30	49	103	91	59	332	1096	3.30	0.66	7th
Physical Environment	28	19	72	90	123	332	1257	3.79	0.76	3rd

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

The Table 4.13 illustrates the relevance accorded to population density in hostel facilities. All spaces scored over the 0.60 mark signifying that population density is important in the hostel facility. Students care mostly about the population in rooms judging by its first position with a RII=0.79.

Table4.14 ; Relevance of Handicapped Accessibility in Hostel Facilities

Spaces	**Importance Level**						**Total**	**Mean**	**RII**	**Position**
	Frequency of Response									
	1	2.00	3.00	4	5	**∑f**	**∑fx**			
Room	28	19.00	32.00	70	183	332	1357	4.09	0.82	2nd
Restrooms	19	25.00	54.00	70	164	332	1331	4.01	0.80	3rd
Laundry	18	24.00	65.00	90	135	332	1296	3.90	0.78	4th
Staircase/Corridor/Hallways	24	20.00	63.00	76	149	332	1302	3.92	0.78	4th
Common Rooms	16	17.00	78.00	95	126	332	1294	3.90	0.78	4th
Cafeterias	19	18.00	71.00	90	134	332	1298	3.91	0.78	4th
Stores	20	29.00	83.00	84	116	332	1243	3.74	0.75	8th
Physical Environment	12	20.00	52.00	66	182	332	1382	4.16	0.83	1st

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.14 illustrates the consensus of the respondents on the issue of accessibility in hostel facilities for the percentage of the population that is handicapped as indicated by the scores above the 0.60 mark. The subject matter is considered of very extreme importance to the physical environment, rooms and restrooms with RII scores of 0.83, 0.82 and 0.80 respectively.

Table4.15; Relevance of other Design Factors

Options		Likert Scale					Total	Mean
		1	2	3	4	5		
Proximity of hostels to essential services and views	Frequency	53	12	20	80	167	332	3.89
	Percentage	15.96	3.61	6.02	24.10	50.30	100	
Importance of standard room furnishings e.g. beds, reading Tables, chairs, reading lamps	Frequency	20	1	12	52	247	332	4.52
	Percentage	6.02	0.30	3.61	15.66	74.40	100	
Important of self-catered kitchens to hostel facilities	Frequency	19	17	64	122	110	332	3.86
	Percentage	5.72	5.12	19.28	36.75	33.13	100	
Importance of a pharmacy with certified medical personnel attached for emergency cases and first aid within the hostel facility.	Frequency	19	1	10	59	243	332	4.52
	Percentage	5.72	0.30	3.01	17.77	73.19	100	

Source: Field Survey (2014)

Table 4.15 illustrates the responses by the respondents to other design consideration in hostel facilities. As regards the proximity of hostels to essential services and views, 50.30% considered it extremely important, as regarding the furnishings of hostel rooms 74.40% thought it to be extremely important and on whether they thought self-catered kitchens were relevant, in close par 33.75% judged it to be important and 33.13% reasoned it to be extremely important. 73.19% of the respondent population believe that it is extremely important to have a pharmacy with a certified medical personnel attached to the hostel to cater for emergency cases and first aid to users of hostel facilities.

Table4.16; Relevance of Extra facilities in the Hostel

Facilities	Importance Level						Total	Mean	RII	Position
	Frequency of Response									
	1	2	3	4	5	∑f	∑fx			
ATMs	8	8	32	84	200	332	1456	4.39	0.88	2nd
Parking Lots	16	37	82	94	103	332	1227	3.70	0.74	6th
Internet Access	2	5	13	41	271	332	1570	4.73	0.95	1st
Mini Market	6	12	34	91	189	332	1441	4.34	0.87	3rd
Bookstores	9	11	46	90	176	332	1409	4.24	0.85	5th
Photocopying Centres	10	8	28	92	194	332	1448	4.36	0.87	3rd

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

On the subject of extra facilities and the import of their provision in hostels, the student respondents believe that they were all very essential. This was highlighted by the RII scored on all the facilities as clearly portrayed in Table 4.16. There were all assessed to have very high significance i.e. RII≥0.80 with the exception of parking lots which scored RII=0.75. Ranking in first position is Internet Access RII=0.97, in second position is ATMs RII=0.88, following in third position Mini Markets and photocopying centres RII=0.87 and fifth Bookstores with a RII of 0.85.

Table4.17; Relevance of Support Facilities in the Hostel

Facilities	Importance Level						Total	Mean	RII	Position
	Frequency of Response									
	1	2	3	4	5	∑f	∑fx			
Equipped Laundry	11	6	44	100	171	332	1410	4.25	0.85	2nd
Study Lounges	5	10	25	89	203	332	1471	4.43	0.89	1st
Salons	5	9	73	121	124	332	1346	4.05	0.81	6th
Faith facilities/religious centres	16	9	47	65	195	332	1410	4.25	0.85	2nd
Recreational Facilities	5	9	60	107	151	332	1386	4.17	0.83	5th
HVAC (Air-conditioning systems)	10	9	52	76	185	332	1413	4.26	0.85	2nd

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

On having support facilities, Table 4.17 illustrates the respondents views considering all support facilities of very high significance/ extreme importance (RII>0.80). In first position however is Study Lounges (RII=0.89). Students approved the need for efficient laundry services, study lounges and salons due to the convenience it would accord them.

Table4.18; Relevance of some Miscellaneous Design Considerations

Options		Likert Scale					Total	Mean
		1	2	3	4	5		
Importance of the conversion of spaces to living spaces without the necessary refurbishment	Frequency	29	25	32	90	156	332	3.96
	Percentage	8.73	7.53	9.64	27.11	46.99	100	
Importance of open-air bathrooms built for students that prefer to take their baths outside	Frequency	78	92	60	62	40	332	2.68
	Percentage	23.49	27.71	18.07	18.67	12.05	100	
Importance of communication between the reception, administrative offices and the rooms	Frequency	16	25	85	133	73	332	3.67
	Percentage	4.82	7.53	25.60	40.06	21.99	100	
Importance of family rooms for married students to accommodate spouses and kids when visited.	Frequency	65	49	65	80	73	332	3.14
	Percentage	19.58	14.76	19.58	24.10	21.99	100	

Source: Field Survey (2014)

Table 4.18 illustrates the results of various design considerations. 46.99% of the respondents agree that space built for other purpose should not be adapted to rooms without the necessary refurbishments. On the issue of the provision of open-air bathroom in hostels for those whose preference is bathing outside, the respondents' opinion were close, with 23.49% of them expressing that it was very insignificant, 27.71% subscribe to its insignificance, and 18.07 are neutral on that matter. 18.67% and 12.05% say it’s important and extremely important

respectively. On the matter of communication, 40.06% subscribes to its importance, 25.60% neutral and 21.99% extremely important. 46.09% of the respondents are in agreement with the issue of having family rooms built to accommodate spouses and kids of married students when visited.

4.3 Responses of Hostel Management Staff

Table4.19; Frequency of Hostel Management Staff Respondents

Staff	**Number of Respondents**	**Approximate Number of Potential respondents**	**Percentage that responded %**	**Percentage of Total management Respondent %**
Hall Administrator	3	3	100%	15
Assistant Hall Administrator	1	3	33.33%	5
Matron	2	6	33.33%	10
Hall Supervisor	5	9	55.56%	25
Porter	9	9	100%	45
Total	20	31		100

Source: Field Survey (2014)

Table 4.19 illustrates the number of hostel management staff that responded to the research. All the Hall's Administrators participated with only one of the assistants available indicating that the hostel's management perspective would be captured. The research also had the full participation of the porters as well as two matrons and five hall supervisors.

4.3.1 School ethos/strategic value

This section addresses how well the building supports the institution's organisational goals and aspirations and how well the user needs are supported.

Table4.20; Frequency of Management Staff Response on Strategic Value and Student Needs

Options	Importance Level					Sum	Total	Mean	RII	Position
	Frequency of response (x)									
	1	2	3	4	5	∑f	∑fx	$\frac{\Sigma fx}{\Sigma f}$		
Academic Performance	0	0	2	7	11	20	89	4.45	0.89	10th
Fostering Mutual Interest	0	0	2	11	7	20	85	4.25	0.85	12th
Intellectual Stimulation	0	2	0	5	13	20	89	4.45	0.89	10th
Inspiration	0	0	2	5	13	20	91	4.55	0.91	9th
Institutional Loyalty	0	0	0	7	13	20	93	4.65	0.93	7th
Providing Cooperation	0	0	0	7	13	20	93	4.65	0.93	7th
Responsible Citizenship	0	0	2	2	16	20	94	4.70	0.94	6th
Student Awareness	0	0	0	4	16	20	96	4.80	0.96	2nd
Contact with others	0	0	0	2	18	20	96	4.80	0.96	2nd
Security	0	0	0	0	20	20	100	5.00	1.00	1st
Unity among Student Populace	0	0	0	4	16	20	96	4.80	0.96	2nd
Developing Personal Character	0	0	0	4	16	20	96	4.80	0.96	2nd

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.20 shows how the hostel management staff responded to the role the hostel building should play in meeting the following students' needs. Generally, the respondents considered all needs to be extremely important as they all scored a RII >0.80. All the respondents consider it extremely important for the hostel facility to provide security for the students showing the state of security challenges faced by the Nigerian society. The issue of developing personal character, unity amongst students, being in contact with others and student awareness were the next highly ranked after security with a RII score of 0.96 respectively. In 12th position but also of very high significance is 'the fostering of mutual interest between students which scored a RII of 0.85.

4.3.2 Functional performance requirement

Functionality of a building deals with the primary purpose of the building. It deals with how well the building contributes to these primary purposes and the extent to which it facilitates

or inhibits the activities of the people who carry out the functions inside and around the building.

Table4.21; Functional requirements in Hostel Facility

Functional requirements	Importance Level (%)					Sum	Total Percentage
	Frequency of Response						
	1	2	3	4	5	∑f	
Adequacy Of space	-	-	2(10)	7(35)	11(55)	20	100
Environmental Quality	-	-	-	2(10)	18(90)	20	100
Aesthetic Appeal	-	-	-	9(45)	11(55)	20	100
Routine Maintenance	-	-	-	2(10)	18(90)	20	100
Privacy	-		2(10)	7(35)	11(55)	20	100
Serenity	-	-	-	4(20)	16(80)	20	100
Comfort	-	-	-	4(20)	16(80)	20	100
Health and Safety	-	-	-	-	20(100)	20	100
Population Density	-	-	2(10)	2(10)	16(80)	20	100
Handicapped Accessibility	-	-	-	2(10)	18(90)	20	100
Qualitative Building materials				17(85)	3(15)	20	100

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

For the functional performance of the building Table 4.21 showed that the adequacy of space (55%), environmental quality (90%), aesthetic appeal (55%), routine maintenance (90%), privacy (55%), serenity (80%), comfort (80%), health and safety (100%), population density (90%) and handicapped accessibility (90%) were considered extremely important in the design of the hostel facility. The use of qualitative materials was also considered important (90%).

Table4.22; Relevance of Miscellaneous Considerations in Hostel Facilities

Options	Importance Level (%)					Sum	Total Percentage
	Frequency of Response						
	1	2	3	4	5	∑f	
Proximity of Hostels to essential services and appealing Views	-	-	2(10)	9(45)	9(45)	20	100
Relevance of Standard Furnishings in a Hostel Room	-	-	4(20)	3(15)	13(65)	20	100
Relevance of Self Catered Kitchen in the hostel Facility	-	-	7(35)		13(65)	20	100
Relevance of a Pharmacy with a certified medical Personnel in the Hostel Facility	-	-	2(10)	2(10)	16(80)	20	100
Misuse of Designed Spaces	-		2(10)	2(10)	16(80)	20	100
Open Air Bathrooms	7(35)	7(35)	4(20)	2(10)	-	20	100
Communication between reception, administrative offices and rooms	-	-	-	7(35)	13(65)	20	100
Special Rooms for Students' Families when visiting	9(45)	-	7(35)	2(10)	2(10)	20	100

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.22 shows that 45%, 45% and 10% of the management staff identified that proximity of the hostel facilities to essential views and services are important, extremely important and neutral respectively. In addition, 65% of the staff considered it extremely important to have the rooms furnished with beds, reading Tables, and reading lamps. 11.1% considered it important while 22.2% were neutral. For the self catering facilities, 65% of the management staff considered the idea extremely important; however, 33.3% had a neutral view. Majority of the management respondents' precisely 80%, considered the idea of having a pharmacy equipped with a certified medic to provide first aid and see to emergency cases an extremely relevant addition to the hostel facilities. 80% also ratified the idea to desist from the direct usage of spaces not designed for accommodation as rooms. 70% of the respondents view the design of *open air bathroom* as irrelevant, 100% has a positive take on communication and

45% are of the opinion that purpose-built room for the spouses and kids of married students are insignificant. 35% are neutral on that subject.

Table4.23; Relevance of Extra Services in Hostel Facility

Services	Importance Level Frequency of Response						Total	Mean	RII	Position
	1	2	3	4	5					
ATMs	0	2	2	2	14	20	88	4.40	0.88	3rd
Parking Lots	0	4	4	2	10	20	78	3.90	0.78	6th
Internet Access	0	0	2	7	11	20	89	4.45	0.89	2nd
Mini Market	0	0	0	2	18	20	98	4.90	0.98	1st
Bookstores	0	2	2	9	7	20	81	4.05	0.81	4th
Photocopying Centers	0	2	2	9	7	20	81	4.05	0.81	4th

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

In the Table 4.23 the staff rated the level of importance of extra services in the hostel facility. All extra services were considered relevant by the management. However, the first position was the mini-market with a RII of 0.98. In second position was the internet access with a RII of 0.89. ATMs came in third with RII of 0.88. Coming in at 4th were Book stores and photocopying centres with RII of 0.81. Finally, in the sixth position management considered parking lots as relevant with RII of 0.78.

Table4.24; Relevance of Support Facilities in Hostel Facilities

Options	Importance Level						Total	Mean	RII	Position
	1	2	3	4	5					
Equipped Laundry	0	0	0	9	11	20	91	4.55	0.90	3rd
Study Lounges	0	0	0	2	18	20	98	4.90	0.98	1st
Salons	0	0	7	11	2	20	75	3.75	0.75	6th
Faith facilities/religious centre	0	0	2	0	18	20	96	4.80	0.96	2nd
Recreational Facilities	0	0	0	11	9	20	89	4.45	0.89	4th
HVAC (Air-conditioning systems)	0	0	4	12	4	20	80	4.00	0.80	5th

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Following Table 4.24 above the management staff rated the support facilities in accordance to how important they thought they were to the hostel facility. All support facilities were

regarded as relevant with study lounges in the first position with a RII 0f 0.98. Faith/religious centres followed in second place with the RII value of 0.96. Equipped laundry (RII= 0.90) were regarded as very essential in the hostel facility. Recreational facilities (RII= 0.89) were seen as very relevant in fourth position. HVAC/air conditioning came in fifth with RII of 0.80. In sixth place but also important is *salons (RII=0.75)*

4.4 Responses of Visitors

Table4.25; Profile of Visitors User group

	Options	**Number**	**percentage**
Visitor's Status	Parent/Guardian	9	45
	Student	9	45
	Others	2	10
		20	**100**
Frequency of visits	Once a Week	6	30
	Once or Twice a month	8	40
	Once a semester	6	30
		20	**100**
Preferred location within the hostel facility for visits	Cafeterias	7	35
	Social Spaces (Common Rooms)	11	55
	Parking Lots	2	10
	Reception/Lobby	0	0
	Rooms	0	0
		20	**100**

Source: Field Survey (2014)

Table 4.25 shows the profile of the visitor respondents. With the total number of visitors to the hostel being 20 (100%), 45% of the population were parents and 45% were students from other institutions. The remaining 10% of the population were neither parents nor students. Of the population of visitors, 40% were at the hostel facilities to visit either once or twice a month 30% were more frequent visitors with their visits being once every week. The less frequent ones visited once a semester and they represented 30% of the population. Therefore they are majorly frequent visitors to the hostel and will have viable input to the research. The largest group of the population which represented 55% preferred to visit in social spaces

(common rooms), 35% and 10% represented those that prefer to visit in the cafeterias and parking lots respectively.

4.4.1 School ethos/strategic value

This section addresses how well the building supports the institution's organisational goals and aspirations and how well the user needs are supported.

Table4.26; Visitors Response on the Relevance of Hostel facility to student Needs

Needs	Importance Level					Sum	Total	Mean	RII	Position
	Frequency of Responses(x)									
	1	2	3	4	5	Σf	Σfx	$\frac{\Sigma fx}{\Sigma f}$		
Academic Performance	4	2	3	8	3	20	64	3.2	0.64	9th
Fostering Mutual Interest	4	2	1	8	5	20	68	3.4	0.68	5th
Intellectual Stimulation	4	2	0	9	5	20	69	3.45	0.69	4th
Inspiration	4	0	9	2	5	20	64	3.2	0.64	9th
Institutional Loyalty	3	2	2	10	3	20	68	3.4	0.68	5th
Providing Cooperation	3	3	6	4	4	20	63	3.15	0.63	11th
Responsible Citizenship	3	3	3	7	4	20	66	3.3	0.66	7th
Student Awareness	8	2	4	3	3	20	51	2.55	0.51	12th
Contact with others	3	3	1	7	6	20	70	3.5	0.70	3rd
Security	0	2	4	8	6	20	78	3.90	0.78	1st
Unity among Student Populace	5	0	1	12	2	20	66	3.70	0.66	7th
Developing Personal Character	2	2	4	5	7	20	73	3.65	0.73	2nd

Source: Field Survey (2014)

Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.26 shows the responses of the visitors to the question of the part they thought the hostel facilities should play in meeting their needs. All of the needs were considered important by them with the exception of *Student Awareness* with a RII score of 0.51 which they judged to be of low significance. On the top of their list of important needs is *Security* (RII=0.78), in second place with RII=0.73 is *Developing personal character* and following

closely in third place is *Contact with others* RII=0.70. All the needs fell within the 0.60 ≤ RII ≤ 0.80 range, indicating they were all assessed to have high significance.

4.4.2 Functional performance

Table4.27; Visitors Response on the Relevance of Adequacy of Space in Hostel facility

Options	Importance Level					Sum	Total	Mean	RII	Position
	1	2	3	4	5	Σf	Σfx	$\frac{\Sigma fx}{\Sigma f}$		
Room	5	0	1	8	6	20	70	3.5	0.70	2nd
Restrooms	4	1	2	10	3	20	67	3.35	0.67	4th
Laundry	7	3	4	4	2	20	51	2.55	0.51	7th
Staircase/Corridor/Hallways	0	5	5	7	3	20	68	3.4	0.68	3rd
Common Rooms	3	2	9	2	4	20	62	3.1	0.62	5th
Cafeterias	6	2	3	4	5	20	60	3	0.60	6th
Stores	3	10	4	1	2	20	49	2.45	0.49	8th
Physical Environment	1	2	4	9	4	20	73	3.65	0.73	1st

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.27 illustrates the views of the visitors as regarding adequate space in the hostel facilities. Adequate space is estimated to be of high significance i.e. 0.60 ≤ RII ≤ 0.80 in all the spaces with the exception of Laundry and stores with RII scores of 0.51 and 0.49 respectively.

Table4.28; Visitors Response on the Relevance of Environmental Quality in Hostel Facility

Options	Importance Level					Sum	Total	Mean	RII	Position
	1	2	3	4	5	Σf	Σfx	$\frac{\Sigma fx}{\Sigma f}$		
Room	4	1	1	7	7	20	72	3.6	0.72	2nd
Restrooms	6	3	3	5	3	20	56	2.8	0.56	7th
Laundry	1	7	4	6	2	20	61	3.05	0.61	6th
Staircase/Corridor/Hallways	0	4	3	10	3	20	72	3.6	0.72	2nd
Common Rooms	0	6	6	5	3	20	65	3.25	0.65	4th
Cafeterias	2	2	8	5	3	20	65	3.25	0.65	4th
Stores	6	6	3	2	3	20	50	2.5	0.50	8th
Physical Environment	2	0	3	9	6	20	77	3.85	0.77	1st

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Environmental quality; ventilation, acoustics, lighting and odour were considered of low significance (RII<0.60) in the restrooms and in the Stores. It was considered most relevant in the physical environment RII=0.77.

Table4.29; Visitors Response on the Relevance of Aesthetic Appeal in Hostel Facility

Options	**Importance Level frequency**					**Sum**	**Total**	**Mean**	**RII**	**Position**
	1	**2**	**3**	**4**	**5**	**Σf**	**Σfx**	$\frac{\Sigma fx}{\Sigma f}$		
Room	1	4	3	9	3	20	69	3.45	0.69	2nd
Restrooms	6	4	5	2	3	20	52	2.6	0.52	8th
Laundry	2	2	9	4	3	20	64	3.2	0.64	4th
Staircase/Corridor/Hallways	1	2	7	7	3	20	69	3.45	0.69	2nd
Common Rooms	0	10	3	3	4	20	61	3.05	0.61	5th
Cafeterias	5	4	4	5	2	20	55	2.75	0.55	7th
Stores	3	6	4	5	2	20	57	2.85	0.57	6th
Physical Environment	2	2	2	8	6	20	74	3.7	0.74	1st

Source: Field Survey (2014)

Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.29 illustrates the opinion of the visitor as regards aesthetics within hostel facilities. The physical environment ranked first with RII=0.74 followed by the room and staircase/corridor and hallways with RII of 0.69. Aesthetics were not considered as important in the Restrooms, cafeterias and stores evidenced by the RII scores of 0.52, 0.55 and 0.57 correspondingly.

Table4.30; Visitors Response on the Relevance of Routine Maintenance in Hostel Facility

Options	Importance Level frequency					Sum	Total	Mean	RII	Position
	1	2	3	4	5	Σf	Σfx	$\frac{\Sigma fx}{\Sigma f}$		
Room	3	0	2	8	7	20	76	3.80	0.76	1st
Restrooms	3	2	1	7	7	20	73	3.65	0.73	2nd
Laundry	3	2	4	7	4	20	67	3.35	0.67	5th
Staircase/Corridor/Hallways	3	1	7	5	4	20	66	3.30	0.66	7th
Common Rooms	3	1	4	10	2	20	67	3.35	0.67	5th
Cafeterias	2	3	4	3	8	20	72	3.60	0.72	3rd
Stores	2	6	4	6	2	20	60	3.00	0.60	8th
Physical Environment	3	2	0	10	5	20	72	3.60	0.72	3rd

Source: Field Survey (2014)

Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.30 highlights the respondents' opinion on the importance of Routine maintenance in the spaces in hostel facilities. They considered it of high significance in all the spaces substantiated the RII scores ranging between $0.60 \leq RII \leq 0.80$.

Table4.31; Visitors Response on the Relevance of Privacy in Hostel Facility

Options	Importance Level Frequency					Sum	Total	Mean	RII	Position
	1	2	3	4	5	Σf	Σfx	$\frac{\Sigma fx}{\Sigma f}$		
Room	4	1	4	8	3	20	65	3.25	0.65	6th
Restrooms	4	3	3	1	9	20	68	3.4	0.68	2nd
Laundry	3	3	5	3	6	20	66	3.3	0.66	3rd
Staircase/Corridor/Hallways	3	3	4	8	2	20	63	3.15	0.63	7th
Common Rooms	5	2	4	2	7	20	64	3.2	0.64	4th
Cafeterias	4	2	2	10	2	20	64	3.2	0.64	4th
Stores	9	3	2	4	2	20	47	2.35	0.47	8th
Physical Environment	4	1	2	6	7	20	71	3.55	0.71	1st

Source: Field Survey (2014)

Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

As regarding privacy within hostel facilities, Table 4.31 shows the responses of the respondents on the issue. Privacy is considered essential i.e. of high significance in all spaces except the stores (RII=0.47)

Table4.32; Visitors Response on the Relevance of Serenity in Hostel Facility

Options	Importance Level					Sum	Total	Mean	RII	Position
	Frequency									
	1	2	3	4	5	Σf	Σfx	$\frac{\Sigma fx}{\Sigma f}$		
Room	3	1	3	3	10	20	76	3.8	0.76	2nd
Restrooms	2	2	2	7	7	20	75	3.75	0.75	3rd
Laundry	4	6	2	5	3	20	57	2.85	0.57	5th
Staircase/Corridor/Hallways	3	5	7	3	2	20	56	2.8	0.56	8th
Common Rooms	0	4	4	6	6	20	74	3.7	0.74	4th
Cafeterias	3	3	9	4	1	20	57	2.85	0.57	5th
Stores	6	2	4	5	3	20	57	2.85	0.57	5th
Physical Environment	1	1	1	10	7	20	81	4.05	0.81	1st

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.32 demonstrates the position of the respondents on the relevance of serenity in hostel facilities. Serenity is assessed to be of very high significance i.e. RII ≥0.80 in the physical environment. It is also considered of high significance in the rooms, restrooms and common rooms with RIIs of 0.76, 0.75 and 0.74 respectively. Serenity is not considered as significant in the Hallways, laundry, cafeteria and stores supported by the RII scores of 0.56, 0.57, 0.57 and 0.57 correspondingly.

Table4.33; Visitors Response on the Relevance of Comfort in Hostel Facility

Options	Importance Level					Sum	Total	Mean	RII	Position
	1	2	3	4	5	Σf	Σfx	$\frac{\Sigma fx}{\Sigma f}$		
Room	3	0	4	2	11	20	78	3.90	0.78	1st
Restrooms	3	2	1	10	4	20	70	3.50	0.70	5th
Laundry	1	2	5	10	2	20	70	3.50	0.70	5th
Staircase/Corridor/Hallways	2	5	7	1	5	20	62	3.10	0.62	8th
Common Rooms	3	1	3	6	7	20	73	3.65	0.73	3rd
Cafeterias	1	3	7	2	7	20	71	3.55	0.71	4th
Stores	3	3	6	4	4	20	63	3.15	0.63	7th
Physical Environment	2	0	4	6	8	20	78	3.90	0.78	1st

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Comfort as demonstrated by Table 4.33 was considered of high significance in all the spaces with hostel facilities. It was most especially viewed as most important in the rooms and physical environment proven by the RII=0.78.

Table4.34; Visitors Response on the Relevance of Health and Safety in Hostel Facility

Options	Importance Level					Sum	Total	Mean	RII	Position
	Frequency									
	1	2	3	4	5	Σf	Σfx	$\frac{\Sigma fx}{\Sigma f}$		
Room	1	1	0	5	13	20	88	4.40	0.88	1st
Restrooms	2	0	4	3	11	20	81	4.05	0.81	5th
Laundry	1	1	3	4	11	20	83	4.15	0.83	3rd
Staircase/Corridor/Hallways	2	2	8	3	5	20	67	3.35	0.67	8th
Common Rooms	1	0	3	6	10	20	84	4.20	0.84	2nd
Cafeterias	1	2	2	6	9	20	80	4.00	0.80	6th
Stores	3	1	6	5	5	20	68	3.40	0.68	7th
Physical Environment	1	0	4	6	9	20	82	4.10	0.82	4th

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.34 exemplifies that health and safety is very relevant in hostel facilities. It was assessed by the respondents to be of *very high significance* (RII ≥ 0.80) in all spaces within the facility with the exception of staircase/corridor/hallways and stores that were assessed to be of *high significance (*$0.60 \leq RII \leq 0.80$).

Table4.35; Visitors Response on the Relevance of Population Density in Hostel Facility

Options	Importance Level					Sum	Total	Mean	RII	Position
	Frequency									
	1	2	3	4	5	Σf	Σfx	$\frac{\Sigma fx}{\Sigma f}$		
Room	2	1	8	5	4	20	68	3.40	0.68	2nd
Restrooms	3	1	7	8	1	20	63	3.15	0.63	7th
Laundry	2	1	8	8	1	20	65	3.25	0.65	4th
Staircase/Corridor/Hallways	3	3	5	4	5	20	65	3.25	0.65	4th
Common Rooms	1	2	8	7	2	20	67	3.35	0.67	3rd
Cafeterias	3	0	9	5	3	20	65	3.25	0.65	4th
Stores	5	4	2	6	3	20	58	2.90	0.58	8th
Physical Environment	1	2	7	7	3	20	69	3.45	0.69	1st

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.35 illustrated the views of the respondents' as regarding population density in hostel facilities. They are of the opinion that where *Stores (RII=0.58)* are concerned population density is not relevant.

Table4.36; Visitors Response on the Relevance of Handicapped Accessibility in Hostel Facility

Options	Importance Level Frequency					Sum	Total	Mean	RII	Position
	1	2	3	4	5	Σf	Σfx	$\frac{\Sigma fx}{\Sigma f}$		
Room	5	2	2	9	2	20	61	3.05	0.61	6th
Restrooms	5	1	3	8	3	20	63	3.15	0.63	4th
Laundry	5	3	1	8	3	20	61	3.05	0.61	6th
Staircase/Corridor/Hallways	4	1	4	9	2	20	64	3.20	0.64	3rd
Common Rooms	3	2	4	8	3	20	66	3.30	0.66	2nd
Cafeterias	5	1	3	8	3	20	63	3.15	0.63	4th
Stores	5	4	3	4	4	20	58	2.90	0.58	8th
Physical Environment	2	2	2	8	6	20	74	3.70	0.74	1st

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.36 illustrates the views of the respondents as regards handicap accessibility. In all the spaces it is considered of high significance with the exception of the stores that scored RII of 0.58.

Table4.37; Visitors Response on the Relevance of other Design Factors in Hostel Facility

Other considerations		Likert Scale					Total	Mean
		1	2	3	4	5		
Proximity of hostels to essential services and views	Frequency	2	2	1	10	5	20	3.70
	Percentage	10	10	5	50	25	100	
Importance of standard room furnishings e.g. beds, reading Tables, chairs, reading lamps?	Frequency	1	0	3	8	8	20	4.10
	Percentage	5	0	15	40	40	100	
Importance of self-catered kitchens to hostel facilities	Frequency	2	3	7	3	5	20	3.30
	Percentage	10	15	35	15	25	100	
Importance of a pharmacy with a certified medical personnel attached for emergency cases and first aid within the hostel facility	Frequency	1	1	7	7	4	20	3.60
	Percentage	5	5	35	35	20	100	

Source: Field Survey (2014)

Table 4.37 illustrates the responses by the respondents to other design consideration in hostel facilities. On the subject of proximity of the hostel facilities to essential services and views 75% of the respondents consider it relevant and 20% consider it to be irrelevant. As regards standard furnishing within the rooms 80% of the respondents believe it to be principal. As regarding self catered kitchens within hostel facilities 35% are taking no sides and 40% judge it to be relevant and the remaining of the population think otherwise. 55% consider having equipped pharmacies with hostel facilities as relevant, 35% of the population are undecided on this aspect and 10% think it is insignificant.

Table4.38; Visitors Response on the Relevance of Extra Facilities in Hostels

Options	Importance Level Frequency					Sum	Total	Mean	RII	Position
	1	2	3	4	5	Σf	Σfx	$\frac{\Sigma fx}{\Sigma f}$		
ATMs	8	1	3	2	6	20	57	2.85	0.57	6th
Parking Lots	1	2	4	7	6	20	75	3.75	0.75	2nd
Internet Access	1	1	2	8	8	20	81	4.05	0.81	1st
Mini Market	4	2	5	5	4	20	63	3.15	0.63	5th
Bookstores	3	1	2	10	4	20	71	3.55	0.71	4th
Photocopying Centres	1	1	8	5	5	20	72	3.6	0.72	3rd

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

On the matter of the provision of these extra facilities and its consequence in the hostel facilities, Table 4.38 illustrates the position of the respondents in this regard. The provision of internet facilities was considered to be the most relevant proven by the RII of 0.81 in the first position. In second place are the *parking lots* with RII of 0.75. ATMs were considered as insignificant by the visitors

Table4.39; Visitors Response on the Relevance of Support Facilities in Hostels

Options	Importance Level Frequency					Sum	Total	Mean	RII	Position
	1	2	3	4	5					
Equipped Laundry	0	0	5	9	6	20	81	4.05	0.81	1st
Study Lounges	1	0	4	10	5	20	78	3.9	0.78	2nd
Salons	8	2	5	5	0	20	47	2.35	0.47	6th
Faith facilities/religious centres	6	3	3	2	6	20	59	2.95	0.59	5th
Recreational Facilities	1	2	6	10	1	20	68	3.4	0.68	3rd
HVAC (Air-conditioning systems)	2	1	9	4	4	20	67	3.35	0.67	4th

Source: Field Survey (2014)
Key: RII<0.60 (low significance); RII0.60≤0.80 (high significance); RII≥0.80 (very high significance).

Table 4.39 shows the results of the opinion of respondents on support facilities in hostel facilities. Salons and religious centres were considered as insignificant facilities to be provided in the hostel evidenced by the scores of RII= 0.47 and RII= 0.59. Equipped

laundries are regarded as extremely important with RII=0.81. Study lounges are regarded as extremely important as well as recreational facilities and Air conditioning systems (HVAC).

Table4.40; Visitors Response on the Relevance of some Miscellaneous Design Considerations

Options		Likert Scale					Total	Mean
		1	2	3	4	5		
Importance of the conversion of spaces to living spaces without the necessary refurbishment	Frequency	0	2	6	10	2	20	3.60
	Percentage	0	10	30	50	10	100	
Importance of building open-air bathrooms for students that prefer to take their baths outside	Frequency	4	7	4	5	0	20	2.50
	Percentage	20	35	20	25	0	100	
Importance of communication between the reception, administrative offices and the rooms	Frequency	1	2	2	12	3	20	3.70
	Percentage	5	10	10	60	15	100	
Importance of family rooms for married students to accommodate spouses and kids when visited.	Frequency	9	4	3	3	1	20	2.15
	Percentage	45	20	15	15	5	100	

Source: Field Survey (2014)

Table 4.40 shows the views of the respondents on certain miscellaneous design consideration within hostel facilities. 60% does not support the conversion of other spaces for accommodation, 75% does not support open-air bathroom and family rooms while 75% think communication is very essential.

4.5 Observation and Interviews

There is no doubt that a great deal of research has been conducted with respect to post occupancy evaluation and on-campus students housing. During this research some themes where identified from the review of literature. These themes described the relationships and interactions within on-campus student housing. Though these themes were products of previous research carried out, this research had to validate/buttress these themes as it relates specifically to the Nigerian environment. This was carried out with the aim of, possibly, identifying new themes that would better help in developing the Post occupancy toolkit.

With the aid of observations, the research was able to identify established themes. Previously, it was stated that the assessment of users' perception was specifically related to the design of the building/facility. In addition, it was also noted that the Hostel facility was a combination of several activities to achieve its proposed design objective: to provide adequate accommodation for university students.

Thus, the research observed the hostel facility based on identifiable interactions between users of the facility and the facility itself. Four Distinct relationships were identified. They include:

1. Student-student interactions
2. Student-facility interactions
3. Student-Staff interactions
4. Staff- Facility interaction

Furthermore, these observations were carried out in eight (8) different spaces, which according to the research were major constituents of an on campus student housing facility. These spaces included;

1. Rooms
2. Corridors
3. Hallways/stairways
4. Stores
5. Cafeteria
6. Common rooms
7. Laundry
8. Restrooms

Most of the themes gleaned from literature were clearly, validated with a few new themes identified. A summary of the results gotten from the observation are as follows.

a. Rooms

According to the interactions listed, room spaces recorded two (2) types of interactions namely: student-student interactions and student-facility interactions. The following are a list of the observations made.

i. Many activities observed in the room spaces connoted social exchanges. They included; eating, sleeping, arranging of lockers/wardrobes, reading, hair braiding, petty trading, dancing, praying, singing, and laundry.
ii. Student-facility interactions were exhibited by "personal space" interaction. Examples included; cooking, arrangement of lockers, charging of phones and lamps, self allocated space for sleeping, and excess personal luggage in the room spaces.
iii. The room spaces observed lacked maintenance.
iv. The room spaces lacked privacy due to over-population and squatters.
v. Room spaces were over-utilized due to overcrowding of the students
vi. Room spaces lacked adequate room furnishings.
vii. Some activities performed in the room contradicted the design purpose of the room space e.g. cooking whereas room were designed for sleeping and studying.
viii. Lack of the safety of property due to over-population in room spaces.
ix. There is little or no record of student-management interactions in the room spaces.

Because of the observations made, during the interviews when the management were asked about some of the issues observed concerning the rooms, some of them had this to say

> "...as a result of the population explosion of students, there are now being over-allocated into rooms that were originally for less number of occupants because of insufficient facilities"
>
> Another management staff had this to say also regarding the rooms
>
> "..Now rooms that was originally for three occupants, two occupants and a single occupant are now being allocated to six/seven, four and two respectively. Too many students within little space therefore there are many instances of property loss and quarrels among students within the rooms. This is to say the least about the issue of squatters".

"I would like the management to make rooms conducive by reducing the number of students per room to a maximum of two," stated a student.

b. **Common rooms** are spaces designed and built to cater for relaxation and entertainment of both students and their guests. Based on the interactions adopted by the research i.e. Student-student interaction, student-facility interaction, management-facility interaction and management-student interaction, the following were the observations made.

   i. Students were observed reading.
   ii. Students were watching television, meeting friends, receiving visitors, buying snacks sold in the kiosks within and chatting.
   iii. In some common rooms within the hostel facilities, it was noted to have students living, hence activities such as cooking, sleeping, and relaxing on mattresses was noted.
   iv. Chairs were seen to be converted to reading tables.
   v. Common room spaces were in dire need of maintenance as broken tiles, wall clocks and chairs were observed to be out of order. Wall finishes were peeling off in most places and ceiling boards were sagging.

c. Restrooms

In the restrooms, which consisted of toilet and bathrooms stalls with wash hand basins lining the opposite sides of the wall the following were taken note off during the period of observation.

The student-student interaction observed in this space was more of social cooperation, competition, and personal space. For example, students were observed taking turns to use the sanitary facilities due to insufficient facilities. From the observations, the research deduced the following:

i. Most of the facilities installed either were out of use or damaged showing a lack of routine maintenance.
ii. there was little or no privacy in the space under study (restrooms)
iii. Very low level of Health and safety

iv. Poor drainage creating a very unhealthy environment

v. inadequate facilities to cater for the total population of students

vi. Poor use of sanitary facilities.

On the matter of the restrooms, during the dialogue with one of the porters, she had this to say.

> "In an ideal hostel facility there are supposed to be adequate facilities to cater for the growing number of students. There are supposed to be sufficient numbers of toilets and bathrooms. Students queue up to use the facilities".
> "Restrooms on each floor in this hostel was originally designed to cater to about 30 students now we have about 70-80 students using leading to the frequent breakdown of the facilities" said one hall supervisor during our chat.

d. **Physical Environment**

From literature, it has been established that the physical environment in a hostel facility plays a major role in harmonizing other facilities that form the entire hostel facility. Thus, the research took special interest in observing the social relationships in this space. Four of the social relationships outlined above were noted. Most of the Activities in the student-student relationship involved social exchanges like greeting and verbal discussions. Student -facility relationships were clearly portrayed by non-verbal action like fetching of water, relaxing under tree shades, washing clothes by taps and sightseeing. On another hand, it was observed that some students preferred to bath outside in the early hours of the morning. Furthermore, the interaction between management and the students was personal: students laying personal complaints regarding issues relating to their hostel accommodation. The Management-Facility interaction was a social stereotype involving monitoring, inspections and making hostel-rounds.

e. Hallways, Staircases and Corridors

Hallways, staircases and Corridors have played a major role in connecting spaces in buildings especially hostel buildings. Though not regarded as the most important, hallways/corridors serve as interaction space in the hostel building. The research observed that the student-student, student-facility interactions were demonstrated in the space. The

activities included discussions, petty trading, and a lot of social exchange. Furthermore, it was observed that some social activities carried out in the space conflicted with the intended design purpose of the hallway design. From the observation, the following were deduced:

i. Due to misuse of the design space, there was overcrowding in the hallway space.
ii. Floor decking in the hallways/corridor had deteriorated due to lack of routine maintenance.
iii. Display of goods for sale in the hallways and corridors taking up space for easy passage.

f. Laundry

Laundries in any Hostel facility is regarded as a service area and is a necessity in any on-campus hostel design. From observations, most activities in the laundry were in conflict to the proposed designed activities carried out in the space. Most of the equipments observed in the space either were vandalized or out of use. The following deductions were made;

i. Misuse of design space due to overcrowding and the lack of maintenance.
ii. Conversion of laundry in Ribadu and Alexander halls into cooking areas
iii. Ill equipped laundries
iv. Stagnant water on grounds in many laundry spaces in case study hostels

During the observation period, this is what one of the students had to say concerning the matter of laundry service.

> "What I feel should be added to the 50 years old hostel facilities is a quality laundry service. This will go a long way in helping the students with their dirty clothes as they have little or no time for that due to their busy schedule".

g. Extra and Support facilities

On the question of the aforementioned facilities, they should be provided in the hostels so that it would attract the students to stay on campus rather than finding other options of off-campus housing and more so, so that they can be comfortable enough to learn was the

opinion of one of the hall administrators during our talk. On this issue, the management had some of these concerns raised.

> "Internet facilities can be incorporated so that students can use them instead of going outside to look for internet facilities reducing the insecurities encountered by female students such as rape and molestation."

Still on the issue, a student emphasised the importance of internet facilities by saying,

> "The subject of internet facilities should be taken very seriously by the school management as it no longer is a matter of luxury but necessity born from the need to be able to compete with our counterparts in advanced countries."

> I like to study in the convenience of the hostel, but this is not possible because my room is crowded and almost always noisy," said one student.

The hall administrator of one of the case study hostels said of studying in the hostel that,

> "Some years ago, there were plans on ground to build a study library in the hostel, but it still has not come to fruition as we speak. It will be of great benefit to students to be able to find a comfortable and conducive place to study within the hostel environment."

There is a need for the provision of ceiling fans in rooms if air-conditioning cannot be provided a student who said made this clear

> "We need fans because during the hot seasons the rate of malaria increases because windows and doors are sometimes left open for air".

A post-graduate student during the observation and consequently talks with the occupants complained,

> "Recently I was visited by my children and help in the hostel and it was such a nuisance to my roommates. It would be a good idea to have family accommodations for married students."

It was noted also that some students within the post-graduate hostels had their kids and helps with them in the rooms sometimes doubling the number of occupants in the rooms. The inconvenience it posed to the fellow roommates was clear to see.

On the matter of self-catered kitchens, a student stated that

> "Kitchens should also be built, because of the carbon dioxide released when cooking is done in rooms and this is harmful."

Concerning recreational facilities, a student has this to say

> "The introduction of recreational facilities in the hostel is a really good idea as this will help the students to combat stress encountered in their daily activities and academics."

The facilities we have on ground are not bad as long as there are routinely maintained and depopulated stated a student.

A porter said, "Routine maintenance is healthy for the buildings and makes it easier for us to do our work."

During the interview with the management and staff of Alexander hall, two porters excused themselves to attend to a student who had a medical emergency. I questioned the ways the students could communicate with the staff in situations whereby such a student is alone and cannot get to the health services on their own. The management staff had this to say.

> "It would really be very beneficial to be able to have communication facilities between the offices of the management and rooms and between the rooms and the security posts."

In summary the themes are; strategic value, Functional performance- adequacy of space, environmental quality (noise, ventilation), aesthetic appeal, privacy, routine maintenance, serenity, handicapped accessibility, population density, health and safety, extra facilities, support facilities, relevant design considerations and miscellaneous design considerations.

5.0 SUMMARY OF FINDINGS, CONCLUSIONS, RECOMMENDATIONS

5.1 Summary of Findings

This Research set out to develop a suitable POE toolkit to adequately assess end-user needs by answering the question, 'how can all user-groups be involved in the evaluation of the on-campus student housing facility in Nigeria?' During the course of the study, three (3) user-groups were identified namely; the students, the visitors and the Hostel management/staff.

The research, through the aid of observations, semi-interviews and interviews validated the themes obtained from Literature that characterized the relationships and activities in the hostels. Furthermore questionnaires and interviews were used to ascertain the level of importance the observed themes were to the different user groups. The following points summarize the findings of this study.

i. "Security" as a student need, according to all user-groups is the most desired strategic value being added by the hostel facility in the Nigerian environment as clearly shown by the RII values of 0.83, 1.00 and 0.78 respectively.

ii. Functional performance requirements of the Building i.e., adequacy of space, environmental quality, aesthetic appeal, routine maintenance, privacy, serenity, comfort, health and safety, population density, handicapped accessibility are relevant in the design of hostel facilities.

iii. Academic performance, fostering mutual interest, intellectual stimulation, inspiration, institutional loyalty, providing cooperation, responsible citizenship, student awareness, contact with others, security, unity among other student populace and developing personal character are relevant needs a hostel facility should address in Nigerian academic environment.

iv. According to all user-groups, extra facilities like ATMs (0.88), parking lots (0.78), internet access (0.95), mini-markets (0.87), Bookstores (0.85) and photocopying centres (0.87) are essential in the functioning of a hostel facility.

v. 'Study Lounges' as the most desired support feature and 'Rooms' the most important designed space in a hostel facility with an average RII score of 0.88 and 0.83 respectively.

vi. Privacy in stores according to all users is an insignificant functional requirement in the design of hostel facilities as shown by the RII scores of 0.59 for students and 0.47 for visitors.

vii. In terms of the functional performance of the hostel facility, with average RII values of 0.69 and 0.57 for both students and visitors, Store spaces are least considered as important, in design.

viii. Proximity, provision of Standard room furnishing and Self-catered kitchens are essential in the design of Hostels with over 50% frequencies.

ix. Communication (62%) and medical facilities (91%) are relevant and Open air bathrooms (30%) are insignificant.

5.2 Conclusions

This study aimed at answering the research question: 'How can all user groups be involved in the evaluation of the on-campus housing facility?' From the study of post occupancy evaluation concepts, protocols and strategies, the research concluded that post occupancy evaluation is a viable tool in the provision of valuable information towards the goal of continuous improvement.

In identifying key areas and issues the post occupancy toolkit should evaluate, relevant themes were identified and these formed the basis of developing the POE toolkit. These

themes include; strategic value/Ethos, the functional performance requirement of the building, Extra and Support facilities

The research developed a POE toolkit for student on-campus housing specific to the Nigerian Academic Environment solely based on the feedback of the user-groups in the hostel facility (Appendix VI). This toolkit accounted for all user groups, addressed areas such as the institutions strategic value, functional requirements- adequacy of space, environmental quality, privacy, population density, serenity, comfort, health and safety, handicapped accessibility, routine maintenance, Extra facilities, Support facilities, other design consideration and miscellaneous considerations.

5.3 Recommendations

Based on the findings obtained in this research, it is recommended that future design of hostel building should incorporate the input of the different user groups identified in this research namely: Management, Student, Maintenance and cleaning staff, security and Visitors.

It is based on the above findings that the following recommendation are made

i. Security of life and property should be given topmost priority in the design and construction of hostel facilities in Nigeria
ii. Functional requirements such as adequate space, environmental quality, aesthetic appeal, routine maintenance, privacy, serenity, comfort, health and safety, population density and handicapped accessibility should be considered in the design of all spaces in hostel facilities
iii. The management of any institution should ensure that the hostel facility create an environment where Academic performance, fostering of mutual interest, intellectual stimulation, inspiration, institutional loyalty, cooperation, contact with others, unity and character development needs of students are met.

iv. Extra facilities such as ATMs, parking lots, internet access, bookstores, mini-market and photocopying centres should be provided in future designs and incorporated in existing hostel facilities.

v. Study lounges should be provided in hostels

vi. Rooms should be carefully designed so as to be comfortable for all students with standard furnishings included and self-catered kitchens.

vii. All aspects of hostel facilities should be designed to be handicapped accessible.

viii. A fully functional pharmacy with at least a medical personnel should be provided in hostel facilities

ix. Proximity should always be considered in the design of hostel facility.

x. Communication facilities between administrative blocks/offices, security outposts and rooms should be incorporated.

5.4 Recommendations for Further Study

The research was limited to developing a toolkit for female on-campus student housing. Thus further study should look into

i. Validating the effectiveness of the toolkit in evaluating the hostel facilities.

ii. Developing a web-based system which will enhance the performance of the toolkit.

5.5 Contribution to Knowledge

In answering the research question, **a unique method** was developed to evaluate on-campus housing with specific themes in the toolkit validated by the users. This toolkit evaluates the hostels from the stakeholders' perspective and is specific to the Nigerian environment.

In assessing the perspective of stakeholders, the research established that '**Security**' of life and property is the **most important need** in the hostel facilities in Nigeria. In addition, the research established that the '**room'** is the **most important design space** in the design of student on-campus housing facilities in Nigeria.

Finally, the research was able to identify **four distinct interactions** within the hostel facility namely;

i. student-student interaction
ii. student-facility interaction
iii. student-management interaction and
iv. management-facility interaction

REFERENCES

The Free Encyclopedia. (2014). Retrieved February 13, 2014, from Wikipedia: http://en.wikipedia.org/wiki/Ahmadu_Bello_University

A.B.U. (2013). *Ahmadu Bello University*. Retrieved from Ahmadu Bello University, Zaria, Nigeria: http://portal.abu.edu.ng/accommAdmin/roomsetup.php?pageNum_roomsetup=8&totalRows_roomsetup=4240

Adamchak, S. (2000). *A Guide to Monitoring and Evaluating Adolescent Reproductive Health Programs.* Washington DC.

Adewumi, Y., Famuyiwa, F., & Harrison, E. (2009). Post Occupancy Evaluation of Facilities in Nigerian Private Universities: A Case Study. *Procs 25th Annual ARCOM Conference*, (pp. 505-514). Nottingham UK.

Agagu, O. (2006). *Application of User feedback technique in facilities management.* University of Lagos, Department of Estate Management.

Alumni, A. (2013). *Ahmadu Bello University Alumni*. Retrieved May 8, 2013, from http://www.abu.edu.ng/alumni/AllCommentsSent.php?ComID=36&modi=modi

Amole, D. (2009). Residential Satisfaction in students' Housing. *Journal of Environmental Psychology , 29*, 76-85.

Anderson, L. (2008). Architecture(Building). Redmond, WA: Microsoft Encarta.

Baird, G. (2001). Post-Occupancy Evaluation & Probe: A New Zealand Perspective. *Building Research Information* , 469-472.

Bale, J. (2010, June). *The Chartered Institute of Building.* Retrieved from The Chartered institute of Building Web site: http://www.ciob.org/sites/default/files/Redefining%20Construction%20Management.pdf

BCON. (n.d.). *British Council Nigeria.* Retrieved JUly 11, 2014, from British Council of Nigeria web site: http://www.Britishcouncil.org/Nigeria-educationuk-accommodation

Bechtel, R. (1997). *Environment and behaviour: An Introduction.* CA: Thousand Oaks.

Bordas, B., & Leaman, A. (2005). Occupancy-Post Occupancy Evaluation. In *Assessing Building Performance* (p. 96). Oxford: Elsevier.

Bordass, W., Leaman, A., & Eley. (2006). *A Guide to feedback and Post-Occupancy Evaluation.* The Usable Buildings Trust.

British Council for Offices. (2007). BCO Guide to Post Occupancy Evaluation. Retrieved from http://www.bco.org.uk/Research/BestPracticeGuides/Guide-to-Post-Occupancy-Evaluation.aspx

Burton, M. L., Croce, M. D., Masri, S. A., Batholomew, M., & Yefremian, A. (2005). Sampling from the United States Census Archives. Field Methods. *Field Methods , 17*, 102-118.

Canter, D. (1970). Architectural psychology. *Conference Proceedings* (p. 5). London: RIBA.

Cardellino, P., Leiringer, R., & Clements-Croome. (2009). Exploring the Role of Design Quality in the Building Schools for the Future Programme. *Architectural Engineering & Design Management , 4*, 249-262.

Chartered Institute of Building. (2014, february 26). *CIOB*. Retrieved February 26, 2014, from CIOB web site: http://www.ciob.org/redefining-construction-management

Cohen, R. S. (2001). Assessment of Building Performance in Use:The Probe Process. *Building Research and Information* , 85-102.

Cohen, R., Standeven, M., Bordass, B., & Adrian, L. (2001). Assessing Building Performance in Use 1: The Probe Process. *Building Research and Information , 29* (2), 85-102.

Conrad, V., Julia, B., Sandra, K., & Kornadt, O. (2013). Occupant requirement in residential buildings:an empirical study and a theoretical model. *Advances in Building Energy Research , 7* (1), 1-15.

Construction Benefit Services. (2014). *Construction Benefit Services*. Retrieved from Construction Benefit Services Web site: http://www.cbserv.com.au/home/cbs/index.php?option=com_content&view=article&id=49&Itemid=55

Cooper, I. (2001). Post-occupancy evaluation-where are you? *Building Research and Information , 29* (2), 58-63.

Crotty, M. (1998). *The Foundations of Social Research.* London: Sage.

Dahlan, N., Jones, P., Alexander, D., Salleh, E., & Alias, J. (2009). Evidence base prioritisation of indoor comfort perceptions in Malaysian typical multi-storey hostels. *Built Environment , 44*, 2158-2165.

Egan, J. (1998). *Rethinking Construction.* London: HMSO.

Egwuom, E. (2010). *The socio-Economic Implication of the Non-Residential Housing Policy of Imo State University.* Department of urban and Regional Planning.

Federal facilities Council. (2002). *Learning from our buildings: A state of the practice summary of Post Occupancy Evaluation.* Washington DC: National Academic Press.

Fellows, R., & Liu, A. (2003). *Research method For Construction* (2nd ed.). Oxford, United Kingdom: Blackwell Publishing.

Forbes, L. (2003). *Improving Educatonal Facilities Design and Construction Through Post Occupancy Evaluation Facility Planning and Standards.* Florida, Miami, United States of america.

Foubert, J., Tepper, R., & Morrison, D. (1998). Predictors of student satisfaction in university residence halls. *Journal of College and University Student Housing , 21*, 41-46.

Gregen, K. J., & Gregen, M. M. (2008). *Social Construction and Physchological Inquiry. In. J.Holstein & J. Gubrium (Eds.).* Thousand Oaks: Sage.

Hassanain, M. A. (2008). On the Performance Evaluation of Sustainable Student Housing Facilities. *Journal of Facilities Management* , 212-225.

Higher Education Funding Council for England. (2006). *Guide to Post Occupancy Evaluation.* Westminster: HEFCE.

Huizenga, K. L. (2002). *A Wed-based occupant Survery for Benchmarking Building Quality.*

Jaunzen, D., Cohen, R., Watson, M., Maunsell, F., & Picton, E. (2002). Post Occupancy evaluation-A simple Method For The Stages of Occupancy.

Jiboye, D. A. (2012). Post-Occupancy Evaluation of residential Satisfaction in Lagos, Nigeria: Feedbacks for Residential Improvement. *Frontiers of Architectural Research , 1*, 236-243.

Karim, H., & Crozier, C. (2008). Post-occupancy evaluation: purpose, benefits and barriers. *Facilities , 27*, 21-33.

Kaya, N., & Erkip, F. (2001). Satisfaction in a dormitory building: The effects of floor height on the perception of room size and crowding. *Environment and Behaviour , 33*, 35-53.

Khozaei, F., Hassan, A. S., & Khozaei, Z. (2010). Undergraduate students' satisfaction with hostel and sense of attachment to place: case study University Sains Malaysia. *American Journal of Engineering & Applied Science , 3*, 516-520.

Kooymans, H. P. (2006). Post Occupancy evaluation and workplace productivity. *proceedings from the PRRES Conference 2006* (pp. 1-15). Auckland: Pacific Rim Real Estate Society.

Lam, T., Chung, S., Wong, C., & Hedley, A. (1998). Respiratory Symptoms due to Active and Passive Smoking in Junior secondary School Students in Hong Kong. *International Journal of Epidemiology* , 41-48.

Lang, J., & Burnette, C. (1974). *A Model of the Designing Process.* Dowden Hutchinson and Ross.

Lawrence, A. M. (2013). Post Occupancy Evaluation of On-Campus Students Hall of Residence:A Case Study of Obafemi Awolowo Hall of Residence Ile-Ife . *Greener Journal of Science, Engineering and Technology Research* , 01-11.

Leaman, A. (2002). User Needs and Expectations. 1-13. Blackwell Publishing. Retrieved April 20, 2013, from http://www.ri.salford.ac.uk/peterbarrett/resources/uploads/File/UserNeedsAndExpectations-AL.pdf

Mbamali, I., & Okotie, A. J. (2012). An assessment of the threats and opportunities of globalisation on building practice in Nigeria. *African International Journal of contemporary Research , 2* (4), 143-150.

McGrath, P. T. (2011). A post-occupancy evaluation (POE) study of student accommodation in an MMC/modular building. *Structural Survey; Journal of Building Pathology and Refurbishment , 29* (3), 244-252.

Meir, I., Garb, Y., Jiao, D., & Cicelsky, A. (2009). Post Occupancy Evaluation: An Inevitable Step Towards Sustainability. *Advances in Building Energy Research* , 189-220.

Najib, N. U., & Yusof, N. A. (2009). A Review of Student housing facilities in higher learning institution. Proceeding of the 3rd International Conference on Built Environment in Developing Countries (ICBEDC 2009). *International Conference on Built Environment in Developing Countries*, (pp. 1817-1831).

Najib, N., Yusof, N. A., & Osman, Z. (2011). Measuring Satisfaction with students' Housing Facilities. *American Journal of Engineering and Applied Science* , 52-60.

Newman, M. (2009). *Post Occupancy Evaluation of primary Schools: A Multi-stakeholder Perspective.* PhD Thesis, Coventry.

Okebukola, P. A. (2004). Private Sector Participation in University Hostel Development and Management. *Mono-graph Series , 1* (4), 1-30.

Okebukola, P. (2003). 'Issues in Funding University Education in Nigeria'. *Mono-graph Series , 1* (7).

Okebukola, P. (2006). Priciples and Policies Guiding Current Reforms in Nigerian Universities. *JHEA/RESA , 4* (1), 25-36.

Olsen, W. (2004). *Triangulation in Social Research: Qualitative and Quantitative Research Methods Can Really Be Mixed. In Developments in Sociology.* (M. O. Holborn, Ed.) Causeway Press.

Onu, E. M. (2009). *Construction Operation Recordkeeping an Assessment of the Contribution to Efficient Building Project Delivery.* B.Sc, Ahmadu bello University, Department of Building, Zaria.

Ornstein, S. W. (2005). POST-OCCUPANCY EVALUATION IN BRAZIL. *Evaluating Quality in Educational Facilities* (pp. 135-143). Brazil: OECD/PEB.

Oseland, N. (2007). *Guide to Post-Occupancy Evaluation.* London: British Council for Offices.

Pat-Mbano, E. C. (2012). Examining the Physio, Psycho and socio-Economic Implications of Non-Residential Policy on Imo State Univeristy Students. *Canadian Social Science , 8* (2), 170-179.

Preiser, W. E. (1995). Post-Occupancy Evaluation: how to make buildings work better. *Facilities , 13* (11), 19-28.

Preiser, W. F. (2002). Continuous Quality Improvement through Post-occupancy Evaluation Feedback. *Journal of Corporate Real Estate* , 42-56.

Preiser, W. F., & Vischer, J. C. (2004). *Assessing Building Performance:Methods and Case Studies.* Oxford, UK: Elsevier.

Preiser, W. F., Rabinowitz, H., & White, E. (1988). *Post Occupation Evaluation.* New York: Van Nostrand Reinhold Company.

Preiser, W., & Schramm, U. (1998). Building Performance Evaluation. *Time-Savers Standards for Architectural Data* , 233-238.

Preiser, W., & Vischer, J. (2005). *Assessing Building Performance.* Oxford, United Kingdom: Elsevier.

Rebano-Edwards, S. (2007). Modelling perceptions of building quality-a neural network approach. *Building and Environment , 42* (7), 2762-77.

RIBA. (1965). *Handbook of Architectural Practice and Management.* London: RIBA Publications.

Riley, M., Moody, C., & Pitt, M. (2009). A Review Of The Evolution of Post-Occupancy Evaluation As A Viable Performance Tool.

Royal Institute of British Architects. (1991). "A Research Report for the Architectural Profession". In Duffy F.W.L.H. (ed.) Architectural Knowledge: the idea of a profession . London: E & FV Spon.

Saiful, H. M., & Norhati, I. (2010). Post Occupancy Evaluation Practices: A Procedural Model For A Successful Feedback. *CIB 2010 World Conference.* Salford Quays, United Kingdom.

Sarah J. Wilkinson, P. R. (2011). User Satisfaction in Sustainable office Buildings: A Preliminary Study. *17th Prres Specific Rim Real Estate Society Conference.* Gold Coast Australia.

Schoolworks. (2004). *Post Occupancy Evaluation of Secondary schools.*

Sheila, O. (2005). Post-Occupancy Evaluation in Brazil. *Evaluating Quality in Educational Facilities. III*, pp. 135-143. OECD/PEB.

Sheila, O. W., Rosaria, O., Cesar, I., Ana, J. F., & Maria, B. B. (2012). Post-Occupancy Evaluation in Brazil:It's Impact on Professional Practice. In M.-H. Shauna, F. P. Wolfgang, & G. W. Christopher, *Enhancing Building Performance* (pp. 249-258). Wiley-Blackwell.

Susilawati, C. (2001). Student dormitory development plan with linear programming method. *proceeding of the PRREs 7th annual Conference, (PRREsAC'01)* (pp. 1-8). Surabaya: Indonesia.

Turnpin-Brooks, S., & Viccars, G. (2006). The Development of Robust Method of Post Occupancy Evaluation. *Facilities , 24* (5/6), 177-196.

Turrell, P. (1997). Small is Different:A Strategy of effective management of Maintenance in Nonprofit-making Organisation. *The Royal Institute of Chartered Surveyors* , 1-3.

Ubong, B. (2007). *basseyubong.* Retrieved July 14, 2014, from basseyubong website: www.basseyubong.com/HOSTEL%20ACCOMMODATION.pdf

Ubong, B. (2001). Pupil Personnel Management in School: A New Emphasis under the UBE Scheme. *Ahmadu Bello University Journal of Education, Legal, and Management Studies , 1* (2), 1-13.

Vischer, J. C. (2008). Towards a User-Centered Theory of the Built Environment. *Building Research Institute* , 231-240.

Watson, C. (2003). Review of Building Quality Using Post occupancy Evaluation. *Journal of Programme Education Building , 35*, 1-5.

Watson, C., & Thomson, K. (2005). Bringing Post-Occupancy Evaluation to Schools in Scotland. *OECD/PEB (Organisation for Economic Co-operation and Development/ Programme on Educational Building) Experts Group Meetings on Evaluating Quality in Educational Facilities.* OECD/PEB.

Whyte, J., & Gann, D. (2001). "Closing the loop between design and use:post occupancy evaluation". *Building Research and Information , 29* (6), 460-2.

Wilkinson, S. J., Reed, R. G., & Jailani, J. (2011). User Satisfaction in Sustainable Office Building: A PreliminaryStudy. *17th PRRES Pacific RIM Real Estate Society Conference.* Gold Coast: Pacific RIM Real Estate Society Conference.

Wilmot, A. (2004). *Designing sampling strategies for qualitative social research: with particular reference to the Office for National Statistics' Qualitative Respondent*

Register. Retrieved from http://www.statistics.gov.uk/about/services/dcm/downloads/AW_Sampling.pdf

Yewande, A., Modupe, O., Funlola, F., & Oluranti, F. (2011). Post- Occupancy Evaluation of Post Graduate Hostel Facilities. *Facilities* , 149-167.

Zahran, M. (1972). *College Housing:An Arena of Involvement and Conflict.* Beirut , Lebanon: Beirut Arab UN.

Zimmerman, A., & martin, M. (2001). Post-occupancy evaluation:benefits and barriers. *Building Research & Information* , 168-174.

APPENDIX I

AHMADU BELLO UNIVERSITY, ZARIA
DEPARTMENT OF BUILDING
FACULTY OF ENVIRONMENTAL DESIGN

Vice Chancellor: *Prof. Abdullahi Mustapha B.Sc. (Hons) Pharm (A.B.U, Ph.D (London). FPSN*
Head of Department: *Prof. Kabir Bala B.Sc. (Hons), M.Sc., MBA, Ph.D (A.B.U), FNIOB, MBEng, MSClarb, MIAHS, MAPM*

BLD/4 19th March, 2014

The Hall Administrator,
Queen Amina, Ribadu and Alex Hall,
Ahmadu Bello University,
Zaria

Dear Sir,

LETTER OF INTRODUCTON: ONU MAGARET ENE
(MSC/ENV-DES/1927/2011-12)

The above named is a student of this Department. She has requested for an introductory letter to Queen Amina, Ribadu and Alex Hall to enable her carry out a research in order to gather information for the purpose of course work assignment.

Kindly assist her accordingly.

Thank you.

Yours faithfully,

Department of Building
Fac. of Environmental Design
Ahmadu Bello University
Zaria—Nigeria.

Prof. K. Bala
Head of Department.

APPENDIX II

Post Graduate Research Questionnaire
Department of Building
Faculty of Environmental Design
Ahmadu Bello University
May 2014-05-12

Dear Respondent,
I appreciate you for the time and willingness to participate in this survey exercise consistent with the ongoing research titled 'Development of a Post Occupancy Evaluation Toolkit for Students' Hostel'. This questionnaire has been designed with you in mind to obtain your response regarding how important certain factors are to you as a student in attaining satisfaction with your on-campus housing (hostel) facilities.
Your contribution to this research is very important in obtaining feedback and also in contributing to future design of hostels by highlighting areas of need.
The information you provide is confidential and as such will not be used outside the scope of this research.

Section A- Respondent's Profile

1. What level are you in at the moment of filling out this questionnaire?
   100 □ 200□ 300□ 400□ 500□ 600□ Others□

2. Do you have any form of disability? Yes□ No□

3. If yes in (3) above, please select any related disability
   a. Blind/partially sighted □
   b. Deaf/hearing impaired □
   c. Physical disability □
   d. Others please specify _____

Section B: Functional Performance-School Ethos/Strategic Value

4. This section relates to how the **hostel facilities** contribute to your student life.

Instruction: *Do you feel hostel facilities are important to your needs as a student? Rank how importantly you think they affect the following aspect of your student life. (Rate on a scale of 1-5)*

Indicate with a tick where,	
1	*very insignificant*
2	*insignificant*
3	*neutral*
4	*important*
5	*extremely important*

S/ No	**Needs**	**Importance level**				
		1	**2**	**3**	**4**	**5**
a.	Academic performance					
b.	Fostering mutual interest					
c.	Intellectual stimulation					
d.	Inspiration					
e.	Institutional loyalty					
f.	Providing cooperation					
g.	Responsible citizenship					
h	Student awareness(knowledge of other discipline other than your own)					
i.	Contact with others(roommates of different background and specialisation)					
j.	Security					
k.	Unity among student populace					
l.	Developing personal character					

Section C: Functional performance of Facility

Instruction: *How important are the following factors to you as a student as it relates to the under listed hostel facilities? (Rate on a scale of 1-5)*

a. Adequacy of Space.

S/no		Importance level				
	Adequacy of space in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

Indicate with a tick where,	
1	*very insignificant*
2	*insignificant*
3	*neutral*
4	*important*
5	*extremely important*

b. Environmental Quality; ventilation, Acoustics, Lighting, and odour.

No		Importance level				
	Environmental Quality in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

Indicate with a tick where,	
1	*very insignificant*
2	*insignificant*
3	*neutral*
4	*important*
5	*extremely important*

c. Aesthetic appeal or quality.

S/no		Importance level				
	Aesthetic appeal in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

8. Routine maintenance

S/no		Importance level				
	Routine maintenance of;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

9. Privacy

S/no		Importance level				
	Privacy in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

10. Serenity

S/no		Importance level				
	Serenity in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

Indicate with a tick where,	
1	*very insignificant*
2	*insignificant*
3	*neutral*
4	*important*
5	*extremely important*

11. Comfort

S/no		Importance level				
	Comfort in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

12. Health and Safety

S/no		Importance level				
	Health and Safety in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

13. Population density

S/no		Importance level				
	Population density in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

14. Handicapped Accessibility

S/no		Importance level				
	Handicapped Accessibility in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

15. Proximity of hostel to essential services (academic, food and medical) and appealing views is;
    - ☐ 1= very insignificant
    - ☐ 2= insignificant
    - ☐ 3= neutral
    - ☐ 4= important
    - ☐ 5= extremely important

16. Do you think standard room furnishings are important e.g. beds, reading table, chairs, reading lamps? Please indicate to what level;
    - ☐ 1= very insignificant
    - ☐ 2= insignificant
    - ☐ 3= neutral
    - ☐ 4= important
    - ☐ 5= extremely important

17. How important do you think self catered kitchens are to the hostel facility? Please indicate to what level?
    - ☐ 1= very insignificant
    - ☐ 2= insignificant
    - ☐ 3= neutral
    - ☐ 4= important
    - ☐ 5= extremely important

18. Do you think having these Extra services listed below in the hostels are important? Please indicate to what level?

S/no	Extra Services	Importance level				
		1	2	3	4	5
a	ATMs					
b	Parking Lots					
c	Internet access					
d	Mini market					
e	bookstores					
f	Photocopying centres					

19. I think a Pharmacy with a certified medical personnel attached for emergency cases and first aid within the hostel facility is
    - ☐ 1=very insignificant
    - ☐ 2=insignificant
    - ☐ 3=neutral
    - ☐ 4= important
    - ☐ 5= extremely important

20. Do you think **Support facilities** providing additional amenities in your hostels are important? Please indicate to what level

S/ no	**Support facilities**	Importance level				
		1	2	3	4	5
a	Equipped Laundry					
b	Study lounges					
c	Salons					
d	Faith facilities/religious centres					
e	Recreational facilities					
f	HVAC(air-conditioning systems)					

21. I think it is _____that Spaces which were built for other purposes are not converted to living spaces without the necessary refurbishments. E.g. store rooms, common rooms.
    - ☐ 1=very insignificant
    - ☐ 2=insignificant
    - ☐ 3=neutral
    - ☐ 4= important
    - ☐ 5= extremely important

22. I think it is _____ that open air bathrooms are built for students that prefer to take their baths outside.
    - ☐ 1=very insignificant
    - ☐ 2=insignificant
    - ☐ 3=neutral
    - ☐ 4= important
    - ☐ 5= extremely important

23. I think it is _____ that there should be a form of communication between the reception and the rooms
    - ☐ 1=very insignificant
    - ☐ 2=insignificant
    - ☐ 3=neutral
    - ☐ 4= important
    - ☐ 5= extremely important

24. I think it is _____ that there a family rooms for students that are married to accommodate spouses and kids when visited.
    - ☐ 1=very insignificant
    - ☐ 2=insignificant
    - ☐ 3=neutral
    - ☐ 4= important
    - ☐ 5= extremely important

25. Do you think the quality of Building materials used on floors, walls and ceilings are _____
    - ☐ 1=very insignificant
    - ☐ 2=insignificant
    - ☐ 3=neutral
    - ☐ 4= important
    - ☐ 5= extremely important

Thank you for your time

APPENDIX III

Post Graduate Research Questionnaire
Department of Building
Faculty of Environmental Design
Ahmadu Bello University
May 2014-05-12

Dear Respondent,
I appreciate you for the time and willingness to participate in this survey exercise consistent with the ongoing research titled 'Development of a Post Occupancy Evaluation Toolkit for Students' Hostel'. This questionnaire has been designed with you in mind to obtain your response regarding how important you think certain factors are to students in attaining satisfaction with their on-campus housing (hostel) facilities.
Your contribution to this research is very important in obtaining feedback and also in contribution to future design of hostels by highlighting areas of need.
The information you provide is confidential and as such will not be used outside the scope of this research.

Section A- Respondent's profile

1. I am a _____
    a. Parent/Guardian
    b. Student
    c. Others(please specify)

2. Please tick the most appropriate option that best describes the frequency of your visits to the hostel
    a. I visit once a week
    b. I visit once or twice a month
    c. I visit once a semester

3. Where would you prefer to visit with your host in the student hostel facility
    a. Cafeterias
    b. Social spaces(common rooms)
    c. Parking lots
    d. Reception/lobbies
    e. Rooms

Section B: Functional Performance-School Ethos/Strategic Value

4. *Do you feel hostel facilities are important to the needs of a student? If YES, how importantly do you think they affect the following aspect of a students' life (rate on a scale of 1-5)*

S/No	Needs	Importance level				
		1	2	3	4	5
a.	Academic performance					
b.	Fostering mutual interest					
c.	Intellectual stimulation					
d.	Inspiration					
e.	Institutional loyalty					
f.	Providing cooperation					
g.	Responsible citizenship					
h.	Student awareness(knowledge of other discipline other than your own)					
i.	Contact with others(roommates of different background and specialisation)					
j.	Security					
k.	Unity among student populace					
l.	Developing personal character					

Section C: Functional performance of Facility

Instruction: *How important do you think the following factors are to student as it relates to the under listed hostel facilities? (rate on a scale of 1-5)*

5. Adequacy of Space.

S/no		Importance level				
	Adequacy of space in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

Indicate with a tick where,	
1	*very insignificant*
2	*insignificant*
3	*neutral*
4	*important*
5	*extremely important*

6. Environmental Quality; ventilation, Acoustics, Lighting, and odour.

S/no		Importance level				
	Environmental Quality in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

Indicate with a tick where,	
1	*very insignificant*
2	*insignificant*
3	*neutral*
4	*important*
5	*extremely important*

7. Aesthetic appeal or quality.

S/no		Importance level				
	Aesthetic appeal in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

Indicate with a tick where,	
1	*very insignificant*
2	*insignificant*
3	*neutral*
4	*important*
5	*extremely important*

8. Routine maintenance

S/no		Importance level				
	Routine maintenance of;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

9. Privacy

S/no		Importance level				
	Privacy in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

10. Serenity

S/no		Importance level				
	Serenity in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

11. Comfort

S/no		Importance level				
	Comfort in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

12. Health and Safety

S/no		Importance level				
	Health and Safety in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

13. Population density

S/no		Importance level				
	Population in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

14. Handicapped Accessibility

S/no		Importance level				
	Handicapped Accessibility in;	1	2	3	4	5
a	Rooms					
b	Restrooms					
c	Laundry					
d	Staircase/corridor/hallways					
e	Common rooms					
f	Cafeterias					
g	Stores					
h	Physical environment					

15. Proximity of hostel to essential services (academic, food and medical) and appealing views is;
    - ☐ 1= very insignificant
    - ☐ 2= insignificant
    - ☐ 3= neutral
    - ☐ 4= important
    - ☐ 5= extremely important
16. Do you think standard room furnishings are important e.g beds, reading table, chairs, reading lamps? Please indicate to what level;
    - ☐ 1= very insignificant
    - ☐ 2= insignificant
    - ☐ 3= neutral
    - ☐ 4= important
    - ☐ 5= extremely important
17. How important do you think self catered kitchens are to the hostel facility? Please indicate to what level?
    - ☐ 1= very insignificant
    - ☐ 2= insignificant
    - ☐ 3= neutral
    - ☐ 4= important
    - ☐ 5= extremely important
18. Do you think having these Extra services in the hostels are important? Please indicate to what level?

S/no	Extra Services	Importance level				
		1	2	3	4	5
a	ATMs					
b	Parking Lots					
c	Internet access					
d	Mini market					
e	bookstores					
f	Photocopying centres					

Indicate with a tick where,	
1	*very insignificant*
2	*insignificant*
3	*neutral*
4	*important*
5	*extremely important*

19. I think a Pharmacy with a certified medical personnel attached for emergency cases and first aid within the hostel facility is
    - ☐ 1=very insignificant
    - ☐ 2=insignificant

☐ 3=neutral
☐ 4= important
☐ 5= extremely important

20. Do you think **Support facilities** providing additional amenities in your hostels are important? Please indicate to what level.

No.	**Support facilities**	Importance level				
		1	2	3	4	5
a	Equipped Laundry					
b	Study lounges					
c	Salons					
d	Faith facilities/religious centres					
e	Recreational facilities					
f	HVAC(air-conditioning systems)					

Indicate with a tick where,	
1	*very insignificant*
2	*insignificant*
3	*neutral*
4	*important*
5	*extremely important*

21. I think it is _____that Spaces which were built for other purposes are not converted to living spaces without the necessary refurbishments. E.g. store rooms, common rooms.
☐ 1=very insignificant
☐ 2=insignificant
☐ 3=neutral
☐ 4= important
☐ 5= extremely important

22. I think it is _____that open air bathrooms are built for students that prefer to take their baths outside.
☐ 1=very insignificant
☐ 2=insignificant
☐ 3=neutral
☐ 4= important
☐ 5= extremely important

23. I think it is _____ that there should be a form of communication between the reception and the rooms
☐ 1=very insignificant
☐ 2=insignificant
☐ 3=neutral
☐ 4= important
☐ 5= extremely important

24. I think it is _____ that there are family rooms for students that are married to accommodate spouses and kids when visited.
☐ 1=very insignificant
☐ 2=insignificant
☐ 3=neutral
☐ 4= important
☐ 5= extremely important

25. Do you think the quality of Building materials used on floors, walls and ceilings are _____
☐ 1=very insignificant
☐ 2=insignificant
☐ 3=neutral
☐ 4= important

☐ 5= extremely important

Thank you for your time

APPENDIX IV

Questionnaire/Check list

Management and staff of hostel facility

Functional Performance-School Ethos/Strategic Value

This section relates to how the **hostel facilities** contribute to the student life.

Instruction: *Do you feel hostel facilities are important to the needs of a student? Rank how importantly you think they affect the following aspect of the student life. (Rate on a scale of 1-5)*

Indicate with a tick where,	
1	*very insignificant*
2	*insignificant*
3	*neutral*
4	*important*
5	*extremely important*

S/ No	**Needs**	**Importance level**				
		1	**2**	**3**	**4**	**5**
a.	Academic performance					
b.	Fostering mutual interest					
c.	Intellectual stimulation					
d.	Inspiration					
e.	Institutional loyalty					
f.	Providing cooperation					
g.	Responsible citizenship					
h	Student awareness(knowledge of other discipline other than your own)					
i.	Contact with others(roommates of different background and specialisation)					
j.	Security					
k.	Unity among student populace					
l.	Developing personal character					

Section C: Functional performance of Facility

Instruction: *How important do you think the following factors are to a student as it relates to the hostel facilities? (Rate on a scale of 1-5)*

Indicate with a tick where,	
1	*very insignificant*
2	*insignificant*
3	*Neutral*
4	*important*
5	*extremely important*

No		**Importance level**				
		1	2	3	4	5
1	**Adequacy of space**					
2	**Environmental Quality**					
3	**Aesthetic Appeal**					
4	**Routine Maintenance**					
5	**Privacy**					
6	**Serenity**					
7	**Comfort**					
8	**Health and Safety**					
9	**Population Density**					
10	**Handicapped Accessibility**					
11	**Proximity of Hostel to essential Services and appealing views.**					
12	**Importance of standard room furnishings**					
13	**Self Catered Kitchens**					
14	**Extra Services e.g., ATMS, parking, mini markets, internet access, book stores, and photocopying centres**					
15	**Importance of having a pharmacy with certified medical personnel.**					
16	**Support Facilities like Equipped Laundries, standard lounges, salons, faith facilities/religious centres, recreational centres, and HVAC air conditioning**					
17	**Misuse of different Spaces in the hostel facility especially for living purposes**					
18	**Idea of Open air Bathrooms**					
19	**Communication between the Reception/admin offices and the rooms**					
20	**Provision for Married Students e.g. their families**					

APPENDIX V

Post Occupancy Toolkit

Name of Institution:

Location/address:

Building category/ type of use: Student Accommodation.

Aim: We wish to conduct a performance evaluation of your building. The purpose of this evaluation is to assess how well the building performs for those who occupy it in terms of the strategic objective of the institution and its functional performance. The benefits of building performance evaluation include: Identification of good and bad performance aspects of the building, better building utilization, feedback on how to improve future, similar buildings, or remodelling of your own building.

In the investigation that follows, please respond only to those questions that are applicable to you. Indicate your answers by marking the appropriate blanks with an 'X'.

Section A: Management and Hostel Staff

Section I-Strategic value
This section is concerned with how the institution meets the needs of the students and how its strategic objectives are achieved.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The hostel environment supports the students' academic performance					
The mutual interests of the students are easily fostered in the hostel					
The hostel facility provides and intellectually stimulating environment for the students					
The hostel environment is inspiring					
The students are proud of the hostel facility					
The environment allows for cooperation between students					
The hostel facility creates a sense of responsibility in students					
The students are aware of other disciplines other than theirs through interaction					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The hostel facility provides contact between students					
The hostel environment is secure					
There is unity amongst the student populace					
The character of the students are positively influenced in the hostel environment					

Section II- Functional Performance of building

This section would ask questions about the administrative offices

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
There is adequate space in the reception and offices					
There is adequate lighting in the offices for daily activities					
The office spaces are well ventilated					
The noise level around the office environment is not distracting					
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The design of the reception areas and offices are pleasant in appearance					
The level of privacy in the office is satisfactory					
There is adequate access and circulation for the physically disabled					
There is a calmness in the office environment					
There is provision for fire safety in the offices					
There is frequent and efficient maintenance of administrative offices					

Section III- These section would ask questions about the cafeteria and common rooms

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The size of the cafeteria and common room is adequate in relation to the student population					
The cafeteria and common room are well positioned in relation to other facilities in the hostel					
There is adequate lighting in both common rooms and cafeteria					
The air quality in the common rooms and cafeteria are satisfactory					
The design of the cafeteria and common rooms are harmonious					
The common room and cafeterias are clean					
The common rooms and cafeteria are efficiently maintained					
There is access and circulation for the physically disabled					

Section IV- This section would ask questions on rooms, stores, laundry and physical environment

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The size of the room is adequate for the student population					
There is adequate space in the stores					
The stores are adequately equipped and secure					
There is adequate space to carry out all the necessary activities in the laundry					
There is adequate lighting in the laundry					
The laundry is well ventilated					
The laundry is well equipped					
The laundry is designed with access for the physically disabled					
There is ample space in the physical environment for social interaction and circulation					
The physical environment is aesthetically pleasing	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The physical environment is tranquil					
the design of the physical environment provides easy access for the physically disabled					
There are fire escape routes provided in the physical environment					
There is proper waste disposal from the environment					
The physical environment is regularly maintained					

Section V- This would ask questions on the restroom, stairways/ hallways and corridors

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
There restrooms have sufficient privacy					
The restrooms are routinely maintained					
There is adequate lighting in the restrooms					
The restrooms are handicapped accessible					
The hallways/corridors and staircases are routinely maintained					
The hallway/corridors and staircases are handicapped proofed.					
There is provision for lifts in the hostels.					

Section B: Student User

Section I- This section is concerned with how the institution meets the needs of the students and how its strategic objectives are achieved.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The design of the hostel facility supports your academic performance					
The mutual interests of students are easily fostered in the hostel					
The hostel facility provides an intellectually stimulating environment for you as a student					
I am inspired by the hostel environment					
I am proud of the hostel facility					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The environment encourages togetherness amongst students					
The hostel environment encourages responsible behaviour					
I am aware of other disciplines other than mine through interaction in the hostel					
The hostel facility provides contact between students					
The hostel facility provides a good sense of security					
There is unity amongst the student populace					
My character is positively influenced by the hostel environment					

Section II- This section would ask question about the functional performance of the Rooms

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
There size of my room is sufficient for all the necessary activities					
My room is properly ventilated					
My room has sufficient lighting					
My room is well insulated from noise filtering in from other rooms					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I find my room visually appealing					
I have all the basic furnishings in my room to be comfortable					
I have my personal space in the room					
My room is crowded					
There is provision for the physically disabled in the room					
There is provision for fire safety in the room					
There are frequent repairs of all elements in the room					

Section III- This would ask question about the restroom and Laundry

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
There is ample space in the restrooms					
There is sufficient space to carry out the necessary activities in the laundry					
There is sufficient lighting in the restrooms					
The restrooms are properly ventilated					
The laundries are well lighted					
The restrooms are visually appealing					
The restrooms are private					
The restroom facilities are sufficient to cater to all the students on my floor					
The laundries cater for all students on my block					
There is easy accessibility and circulation for the handicapped in the restroom					
There is easy accessibility and circulation for the handicapped in the laundry					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Waste water is properly drained off in the laundry					
There is provision for waste bin and disposal in the restrooms					
There is adequate supply of water to the restrooms for proper hygiene					
The facilities in the restrooms are regularly repaired					

Section IV- This would ask question about staircases/hallways the physical environment

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The physical environment is aesthetically appealing					
The staircases and hallways have adequate space					
There is ample space in the physical environment for social interaction and circulation					
The physical environment is tranquil					
The design of the physical environment provides easy access for the physically disabled					
There are fire escape routes provided in the physical environment					
There is proper waste disposal from the environment					
The physical environment is regularly maintained					
The staircase/hallways are routinely maintained					
The staircases /corridors and are handicapped proofed.					
There is provision for lifts in the hostels.					

Section V- This would ask questions about the common rooms and cafeterias

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The size of the cafeteria and common room is adequate in relation to the student population					
The cafeteria and common room are well positioned in relation to other facilities in the hostel					
There is adequate lighting in both common rooms and cafeteria					
The air quality in the common rooms and cafeteria are satisfactory					
The design of the cafeteria and common rooms are harmonious					
The common rooms and cafeterias are clean					
The common rooms and cafeteria are efficiently maintained					
There is access and circulation for the physically disabled in both common rooms and cafeterias.					

Section C- Visitors

Section I- This section is concerned with how the institution meets the needs of the students and how its strategic objectives are achieved.

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The hostel environment supports the students' academic performance					
The mutual interests of the students are easily fostered in the hostel					
The hostel facility provides and intellectually stimulating environment for the students					
The hostel environment is inspiring					
The students are proud of the hostel facility					
The environment allows for cooperation between students					
The hostel facility creates a sense of responsibility in students					
The students are aware of other disciplines other than theirs through interaction					
The hostel facility provides contact between students					
The hostel environment is secure					
There is unity amongst the student populace					
The character of the students are positively influenced in the hostel environment					

Section II- This would ask questions about the physical environment

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
There is ample space in the physical environment for social interaction an circulation					
The physical environment is aesthetically pleasing					
The physical environment is tranquil					
the design of the physical environment provides easy access for the physically disabled					
There are fire escape routes provided in the physical environment					
There is proper waste disposal from the environment					
The physical environment is regularly maintained					
The physical environment is kept clean					

Section III- This would ask question about the common rooms and cafeterias

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The size of the cafeteria and common room is adequate in relation to the student population					
The cafeteria and common room are well positioned in relation to other facilities in the hostel					
There is adequate lighting in both common rooms and cafeterias					
The air quality in the common rooms and cafeteria is satisfactory					
The design of the cafeteria and common rooms are harmonious					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The common room and cafeterias are clean					
The common rooms and cafeteria are efficiently maintained					
There is access and circulation for the physically disabled					

Section D- Cleaning Staff

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The design of the hostel facility makes cleaning easy					
There is adequate water supply at all levels in the hostel facility					
Equipment for cleaning are available					
The cleaning equipments are easily accessible and stored					
Overcrowding is a major factor in cleaning					

Section E- Security Staff

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The design of the hostel facility makes it easy to secure it					
The design of the physical environment of the hostel discourages vandalism and theft					
The quality of material used in the hostel facility enhances security					
There is communication between rooms and security outposts in the hostel facility					

Section F – for Everyone

Section VI- This section would ask about Extra facilities

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
ATM's are available for use in the hostels					
The number of available ATMs cater to the students population					
There are sufficient parking lots for use in the hostel facility					
There are mini-markets that cater to students needs					
There is provision for internet facilities in the hostels					
There are fully equipped bookstores in the hostel facility					
There are fully functional photocopying centres in the hostel facility					

Section VII- This section asks about the support facilities in the hostels

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Study lounges are available in the hostel environment for students use					
Salon are provided in the hostel facility for student needs					
there is provision for faith facilities in the hostel facility					
Recreation facilities are provided in the hostel facilities					
Air conditioning is provided in the hostel rooms					

Section VIII- This section asks general question about the hostel

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The hostel facility is well situated in relation to classrooms, social places and transportation					
Every room is furnished with basic, standard room furnishings to aid activities in the room					
Well equipped self-catered kitchens are provided in the hostel facility					
There is a functioning pharmacy with a certified medical personnel within the hostel facility					
The spaces in the facility are not used for activities outside their designed functions.					

APPENDIX VI

Observation evaluation sheet

Name of Facility: _____

Room No/ Space Identifier: _____

Activity in room/space (note any activities at the time of the exercise)

Student-student interaction

Description of the room/space (note unusual/unexpected features)

Purpose of the room/space (i.e. living, storing, passage etc)

Student-Facility interaction

Management-Student interaction

Management-facility interaction

Hostel staff-facility interaction

Users comments