PERFORMANCE EVALUATION OF PUBLIC SECONDARY SCHOOL HOSTEL BUILDINGS IN NIGER STATE

ABSTRACT

Today most of the school building which are supposed to promote and enhance teaching, learning and extra-curricular activities are obsolete and thereby causing serious challenges to the 21st century educational needs of the learners. Most public secondary school hostels buildings in Niger state were built during the colonial era, many of them are so old that they are dilapidated and unsafe for human occupation. Thus, the study aims to evaluate the performance of public secondary school hostel buildings in Niger State. The study utilized a quantitative approach where structured questionnaires were distributed to hostel facility managers and student users of higher classes. A total of 187 questionnaires were retrieved out of the 218 distributed which represent 85.32%. The collected data were analysed using a descriptive statistical method such as relative importance index (RII), the Percentile, and the ranking method. The study revealed that 11 variables which represents 29.73% are in good condition and performance which indicates that the variables do not require immediate maintenance. Sixteen (16) variables which represent 43.24% are fair in condition and performance and ten (10) variables which represents 27.03% have poor condition and performance. It also revealed that the building users are satisfied with the condition and performance of 6 variables, dissatisfied with 10 and fairly satisfied with 21 of the variables. Furthermore, it also revealed that the correlation between the level of building performance attributes and user's satisfaction level is low because (13.25%) implies a positive, but weak statistical relationship between the two set of variables. The research concludes that 70.27% of the variables have performance issues and will require immediate attention or maintenance. It also concluded that 83.78% of the components are in a state that can best be described as dissatisfactory. The relationship is weak, but the positive value obtained indicates that as the condition of the hostels are changing, there will be a corresponding change in the satisfaction level of the occupants. Based on the findings, the study recommends that effective building performance evaluation and maintenance management practices be carried out on the public secondary school hostel building to improve its conditions and comfort of users. Regular inspections and maintenance should be carried out in hostels and adequate funding should be provided for this purpose. It also recommends that BPEs can be conducted from time to time to inform the relevant professionals on the cost cutting measures through effective designs that can be adopted for the construction of similar projects in the future.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

A complete building with its facilities and services must be fit for the purpose it is initiated. Meaning that it should be able to perform its functions in the manner that it will ensure value of the building and satisfaction to its occupants (Ilesanmi, 2010; Hinde, 2012). Although buildings are constructed for different purposes (housing, school, health, etc.), their performance either excellent or poor can be determined by its users (Ilesanmi, 2010; Jiboye, 2012). Educational buildings, facilities, and their environment must be given the highest value for effective functioning and productivity (Olatunji, 2013). Functions of a building has been found to influence the design quality of such building (Codinhoto *et al*., 2009; Ibrahim, 2011; Jiboye, 2012). For example, a well-designed school have the tendency to improve satisfaction, comfort, teaching and learning process of teachers and students thereby improving their educational success (Khan & Kotharkar, 2012; Khalil *et al*., 2015).

A number of reasons have been provided on why school buildings perform poorly in meeting users' needs and expectations. The major reason was lack of adequate knowledge of users' changing needs and preferences by architects and other professionals who design, construct and maintain these buildings. And the panacea to improve the overall performance of buildings is to explore and understand user's needs, expectations and aspirations through regular performance evaluation by means of Building Performance Evaluation (BPE) or Post Occupancy Evaluation (POE) (Khalil & Nawawi, 2008: Ibem *et al.,* 2017). Building Performance Evaluation or (POE) can be defined as the process of obtaining knowledge about building performance from users, and using the feedbacks to inform what needs to be

fine-tuned or improved in the existing school building and also used to better the design qualities of future school building projects (Ilesanmi, 2010; Jiboye, 2012). The objectives of BPE or POE are the same for all buildings including those where educational activities takes place either for primary, secondary or tertiary purposes.

Today most of the school's building which are supposed to promote and improve teaching, learning and extra-curricular activities in secondary schools are obsolete and thereby, creating serious challenges to the 21st century educational needs of the learners, Others are dilapidated and not suitable to motivate secondary school students to learn (Osuji, 2016).

Most secondary school hostel buildings today were built during the colonial era; many of them are so old that they are dilapidated and unsafe for human occupation. While those that are fairly good are congested by students. These buildings or parts of it should be re-placed or reinforced so as to avoid tragedy that may lead to loss of lives of the occupants. These have led to the poor performance of students which is attributed to poor learning environment and lack of facilities among others (Osuji, 2016).

Regarding the design, organizational and operational structures of a secondary school hostel building, it is assumed that its size is determined by the number of student population who is going to be domiciled in the building (Stavroula *et al.*, 2014).

Satisfying users of any facility (including hostel facility) should be one of the main objectives of providing such a facility in the first instance.

It is therefore important that research is conducted to find out the performance evaluation of student hostel building in relation to the perception of users. This is because when students are satisfied with the structures that shelter them, it will lead to an improvement in the

academic performance of the students, safety of the students, and reduction in complaints being filed against the management among others (Ajayi *et al.*, 2015).

1.2 Statement of the Research Problem

Today, most of the secondary school hostel buildings were built during the colonial era; many of them are so old that they are dilapidated and unsafe for human occupation. While those that are relatively good are congested by students (Osuji, 2016). In the 21st century, there has been a tremendous growth in student's population without corresponding improvements in the condition of where the student live (Osuji, 2016). Many buildings do not perform as planned or needed. In some cases this comes with a great impact on the replacement cost of such buildings, running cost of such buildings, performance of such buildings, client satisfaction, health and safety as well as comfort of the occupants (Akinluyi, 2013). For construction of any building whether schools or hospitals, learning from and correcting past mistakes in design and commissioning of buildings can be extremely cost effective and will improve productivity (Akinluyi, 2013). Oftentimes problems associated with building defects are not usually very visible which leads to the conduct of POE so as to reduce the building defects, improve maintenance culture and save cost (Ibem *et al.*, 2013)

Green and Moss (1998) says performance evaluation can be used to upgrade, refurbish an existing building, this act comes with its cost implication, the upgrading and refurbishment of these building facilities comes at a cost to the client. Performance evaluation of a building can be used to improve the process of building procurement (Karim & Carl, 2014). Professionally, the Quantity Surveyor for example provides cost implication for upgrading, renovation, rehabilitation and construction of a new building.

This research work will provide the Quantity Surveyor with information on how to solve POE problems relating to the hostel buildings we use and thereby reducing cost of maintenance and improved future design by the Architect. It will also provide insights to the facilities managers managing the buildings in secondary schools on what type of maintenance culture to adopt. The information gathered will however enable the concerned authorities to improve services, develop strategic policies and offer better housing facilities that can easily be maintained in a manner that it will save cost to both the parents and government.

1.3 Research Questions

1) What is the condition of the hostel buildings in some public secondary schools in Niger State?
2) What is the performance level of the hostel buildings in some public secondary schools in Niger State?
3) What is the levels of user's satisfaction in terms of functional, technical, and indoor environmental quality?
4) What is the relationship between building performance and the users' satisfaction level?

1.4 Aim and Objectives

The aim of the study is to evaluate the performance of public secondary school hostel buildings in Niger State.

Objectives

1) To examine the condition of the hostel buildings in some public secondary schools in Niger State
2) To determine the performance level of some public secondary school hostel building.
3) To determine the level of user's satisfaction in terms of functional, technical, and indoor environmental quality.
4) To determine the relationship between building performance and user's satisfaction level.

1.5 Research gap

Research on performance evaluation or post occupancy evaluation of a building is not a new field of knowledge and expertise (Aliyu *et al*., 2016). Many studies have been carried out by many authors in this field. However, addition to the work done in this area, work need to be carried out on the performance evaluation of public secondary school building in Niger state with emphasis on the hostel building. Hence, this study has to be carried out in order to expose the condition of the building and perception of the students on the performance of the hostel buildings in Niger State.

1.6 Significance of the Study

This research work shall assist every stakeholder (The members of the built environment, policy makers, school administrators, teachers, government and the students) in playing a sensitive role aimed at improving the quality, standard and use of the building in these colleges, this will create a conducive learning environment and improve the standard of education. The information gathered will however enable the concerned authorities to

improve services, develop strategic policies and offer better housing facilities that can easily be maintained in a manner that it will save cost to both the parents and government.

Policy makers will be well equipped with reliable and factual information which serves as an input for effective law making on issues relating to allocation of funds, timely released period and the legal framework guiding its activities. Secondly, it will provide an extensive knowledge of school facilities to the school administrators to initiate, sustain and put to use. It will afford other researchers to look into grey areas not covered in the present study and seek ways of improving over it. It will also place a great burden on the government to provide adequate funding to the school system, equipped the inspectorate unit to carry out its functions effectively.

1.7 Justification for the Study

In order to justify the research gap in this study, the contributions of the following researchers cannot be over-emphasized: In the United Kingdom, Higgins *et al*. (2005) conducted a study on the impact of school environment and found out that the neglect of school buildings will inevitably pervade the student's attitude and staffs. In India Stavroula *et al*. (2014) studied the effect of the school internal environment on secondary education and opined that school building which are in bad shape can cause health problems, lower students morale and contribute to poor student performance.

In Ghana, Stephen and Zotorvie (2017) studied student's accommodation and academic performance and revealed that proximity to lecture halls, spacious and well ventilated rooms; calm and peaceful environment, availability of study area, accommodation fee, and availability of electricity and water were the critical factors that influenced the students'

choice of residential accommodation. In Nigeria, Olatunji (2013) studied post occupancy evaluation of Lagos state polytechnic facilities. Oladoja (2015) carried out a study on performance evaluation of primary health care building in Abuja and revealed that functionality and quality of the primary health care building inhibit the facilities and contribute to poor performance of staff and it also affect the healing process of the patients.

Philip *et al.* (2018) studied post occupancy evaluation of students hostels in federal universities in north central Nigeria and concludes that overcrowding, inadequate spaces, non -availability of recreational spaces and lack of internet services are challenges in hostels. But oftentimes problems associated with building defects are not usually very visible which leads to the conduct of POE so as to reduce the building defects, improve maintenance culture and save cost (Ibem et al., 2013). Then Osuji (2016) studied impact of school facilities on student academic performance in public secondary schools in Giwa and Zaria zones and concluded that school facilities remain one essential factor in the realization of the goals of secondary education.

1.8 Scope of the Study

The study covered physical structure of public secondary school hostels buildings (PSSHB) in Niger State, and not the services rendered by the hostel managers. The choice of Niger state is based on convenience. Performance evaluation of the studied PSSHB were limited to the subjective perceptions of the various categories of its users in Niger State only. This perception is centered on functionality, access and design of the hostels building

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Development of building performance evaluation (BPE)

Building performance evaluation (BPE) also known as post occupancy evaluation (POE) or facility performance evaluation (FPE) originated from United Kingdom (UK) where the British Ministry of Education in conjunction with local governments first undertook evaluations of building in the post-World War II period (Eke *et al*., 2013). The root of BPE according to Preiser *et al*. (1988) is found in the academia since the mid 1960s with the growth of research central on the relationships between human behavior and building design which led to the creation of the new field of environmental design research. The 1960s show an institutional setting focusing on misfits between users and buildings, especially in college dormitories and hospitals (Jiboye, 2012).

The 1970s have systematic and multi-method BPEs with an increase in use and more emphasis on the application of survey, interview and observation techniques, especially with regard to housing satisfaction (Preiser *et al.*, 1988). The mid 1970s witnessed the formation of design guides in military schools and office buildings when the first book on POE was published by the end of 1970s (Akman, 2002). Aliyu *et al*. (2016) added that Until the end of 1970s, most POEs considered user satisfaction, with little attention to the physical environment. Although In the 1980s, POE practice in the public and private sectors gave emphasis to the effect of the physical and organizational effects of work environment on occupant behavior and satisfaction (Aliyu *et al*., 2016).

2.1.1 Evaluation of Buildings in Educational Institutions in Nigeria

Buildings are paramount to the day to day running of human activities, It is of importance to all organizations (Mustafa, 2017). In the present trends of high operating costs, increasing competition and rising user expectations, educational institutions, particularly universities and colleges must seek to maximize their return on building investments (Amaratunga & Baldry, 2000). According to Mustafa (2017) opined that buildings represent a substantial percentage of most educational institutions assets, operating costs, and user requirements; their performance level is therefore very critical to educational effectiveness. Educational buildings are designed and built to meet specific or group of human needs already determined before construction (Mustafa, 2017).

Educational buildings constitute the structural enclosure that are built to support and enables academic activities to run effectively (Gopikrishnan & Topkar, 2017). Mayaki (2005) states that the ability of the building to successfully accomplish the purpose for which it is designed measures its success. In this context, educational buildings are designed to facilitate learning process i.e. knowledge transfer, promotion, and management according to Okolie (2011). Sanoff (2003) maintains that the design of modern educational building strongly emphasizes stimulating and adaptable learning environments with spaces that support various styles of teaching and learning.

Sinopoli (2009) states that feedback from building users, whether they are office workers, shoppers or teachers are invaluable input to building operations or the design of the next building. Then educational building design should be adaptive and flexible to accommodate required functional change within the building envelope and it's environ (Olatunji, 2013). Weller (1995) maintains that the continuous change affecting buildings primarily through

technological and economic influence is likely to increase rather than slow down. Belcher (1997) confirms that some of the potential implications of change for universities are proliferation and diversity of technology, adoption of shared facilities (use of common teaching spaces and laboratories) and greater emphasis on quality in the study place. (Organisation for Economic Co-operation and Development, 2006) affirmed that it is necessary for building facilities to respond to the challenge of changing needs and demand in a knowledge economy. As it is known, change is the only constant phenomenon, the change and transformation within the academic environment, is not totally predictable (Olatunji, 2013).

The polytechnics institutions in Nigeria stand mostly for technical and technological- based approach to learning, this involves a lot of practical-oriented courses in their academic curriculum which is to aid students to obtain academic, technical skills and professional competencies (Olatunji, 2013). This depends on students and staffs being supported and not frustrated by inadequate building facilities or unhealthy built asset environment. Classroom communication for example, requires certain acoustic, visual, and physical conditions, and feedback from efficient design is essential for improving future designs (OECD, 2003)

2.1.2 Models for the Performance Evaluation of Educational Building

Different researchers have suggested and developed models/methodologies on building performance evaluation of buildings, these studies include Preiser *et al.* (1988), Kaplan and Norton (1996), Cash (1993), Sanoff (2001), Kathrine and Svein (2004), Zimring *et al.* (2005), and Alexander (2008). These studies focused on the performance evaluation of educational facilities in relation to space related issues. The methodology involved data collection tools such as questionnaires, walkthroughs, focus group discussions, and

observations. The performance of buildings in educational institutions is affected by different variables which had led to development of various models as outlined below:

1) The balance scorecard (BSC) (Kaplan & Norton, 1996)
2) The process model (Preiser *et al.*, 1988)
3) The building condition and student's achievement models (Mutlag, 2002)
4) The school building assessment model (Sanoff, 2001)
5) The Programme on Education Buildings (PEB) organizing framework for evaluating quality in education spaces/' facilities (OECD, 2006)

The balance scorecard (BSC) model focuses more on four perspectives namely customer, internal process, learning and growth and finance. The process model outlines three levels of effort at which a building performance evaluation can be undertaken namely indicative, investigative, and diagnostic levels. Preiser *et al.* (1988) further identified three levels of performance at which the evaluation of buildings can be considered, namely;

1) The health/safety/security level
2) The functional/ efficiency level and
3) The social, psychological, cultural, and aesthetic level.

Furthermore, Cash (1993) states that leadership and finance influence maintenance and custodial staff (facility staff) which in turn have a corresponding effect on school building condition and performance. Mutlag (2002), from Cash's (1993) model illustrates a direct and indirect relationship between building condition and student's achievement when linked to various factors such as temperature control and ventilation, adequate lighting in relation

to space, aesthetics and colour. Sanoff (2001) identifies five methods of assessing school buildings;

1) Six factors school building assessment method: A walking tour
2) School Building Rating Scale
3) Photo Questionnaire
4) School Building Observation form
5) Wish Poem.

The six-factor assessment method allows one to focus on six key elements of building assessment, namely context, massing, interface, way-finding, social space and comfort. The school building rating scale is qualitative assessment tools which are essential components for meeting the requirements of a learning environment. These include outdoor areas, learning environment, physical features, outdoor areas, media access, transition spaces and circulation routes, visual appearance, safety and security. Numerical ratings are used to score each factor or element being evaluated by users using very unsatisfactory (VU) to very satisfactory (VS) continuum (OECD, 2006).

The OECD (2006) framework for evaluating quality in educational spaces /facilities consists of two dimensions: the first dimension addresses how quality is defined within the context of policy issues and the second dimension presents important characteristics in the process of evaluating aspects of quality in educational facilities. The evaluation tools for these assessment include questionnaires, focus group discussion, walkthroughs, interviews, and observations while the quality of evaluators provided by the framework include researchers, space and asset managers, staff, students and educationists

2.2 Concept of Building performance evaluation widely known as Post occupancy evaluation (POE)

Green and Moss (1998) also suggest that it is incumbent on individual organisations to create learning cycles specifically in relation to the organisations facilities management. The terms building appraisal, building evaluation, building diagnosis, POE, and buildings in use describe studies that focus on completed building projects (Ilesanmi, 2010).

Preiser and Schramm (1998) attempted to widen the scope in the direction of building performance evaluation, to integrate user and aesthetic factors with technical and economic factors. But Watt (2007) uses the term "Building pathology" to describe that aspect of building appraisal that is concerned principally with defects and associated remedial action. Although Duffy (2008) suggests the existence of a terminological dilemma, these concepts aim to find how the completed building performs; determining possible misfits, mistakes, or omissions; and accumulating information for future programming and design efforts. However Preiser and Vischer (2004) consider POE the most commonly used term for the activity of evaluating buildings in-use. POE is about procedures for determining whether design decisions made by the architect are delivering the performance needed by those who use the building(E. Ibem *et al*., 2017).

By using occupants as a benchmark in evaluation, POE provides enormous potential for improving the performance of a building (Karim & Carl, 2014). POE evolved to fill the gap in the conventional building process, which consists of planning, programming, design, construction, and occupancy of a building (Mustafa, 2017).

2.2.1 Approach to building performance evaluation otherwise known as post occupancy evaluation (POE)

There are numerous methods and approaches to BPE, depending on the contextual agenda and the required outcomes (Karim & Carl, 2014). As a response, a number of authors have identified a series of recommendations to those wishing to undertake a POE process. Green and Moss (1998) for example, suggest a general methodological overview that encompasses a three-stage process of planning: establishing scope, purpose and resources for study; execution (collection of data, interviews, questionnaires and direct observation); and analysis and presentation (statistical analysis, technical performance, dissemination in a series of workshops and reports). Alternatively, Vischer (2008) focuses attention on the rigorous standardization of collecting feedback, suggesting that such information should be focused on "a few, carefully selected and identified indicators of environmental quality.

2.2.2. Building performance evaluation process

Building performance evaluation (BPE) or Post-occupancy evaluation (POE) is a systematic evaluation of opinions about buildings in use, from the perspective of the people who use them (Osuji, 2016). It is an assessment of how well the building matches the user's needs, identifies ways to improve building design, performance and how it can fit the purpose for which it was built (Darkwa, 2006).

POE systematically analyses a particular environment to gain understanding of the impact it has on occupants of a building and its environment, hence how it facilitates or inhibits daily activities of the occupants (Watson, 2003). But it is important to note that POE is conducted after the building has been occupied for some time so that occupants are accustomed to the

new space and the experience of moving does not bias the results (Huizenga *et al*., 2003). However, Akinluyi (2013) suggested that systematic analysis is important for various interest groups as it assists them in realizing the potential and limitation of their building and environment. And to put it differently, Oladoja (2015) opined that POE gives managers of buildings a new, efficient diagnostic tool which can be applied to any building type, size and which provides both negative and positive data on building performance. An environment for POE can be an individual building and its setting or a particular group of buildings and their settings. It can also be an individual urban space (Oladoja, 2015).

In post-occupancy evaluations of buildings, as stated by Ilesanmi (2010), occupants ask questions and also provide answers to design professionals. He further added that occupants can have a significant impact on creating change in terms of improving the use of buildings (Ilesanmi, 2010). Furthermore, Eke *et al*. (2013) believed their input is two-fold. Firstly, they provide information and feedback to the architect and the construction company responsible for the design of the building environment. This can lead to improved building design and can influence and change the roles of professionals involved in a building project so that flaws in design or construction-related mistakes are not repeated (Darkwa, 2006 as cited by Mustafa, 2017). Secondly, by empowering end-users through post-occupancy evaluation occupants help to provide benchmarks and contribute towards research on architecture and buildings to show how the end product (the building design and its management) will meet the needs of the occupants (Mustafa, 2017).

Post-occupancy evaluations can show what works and what does not work in the design of a building (Ibem *et al*., 2017).

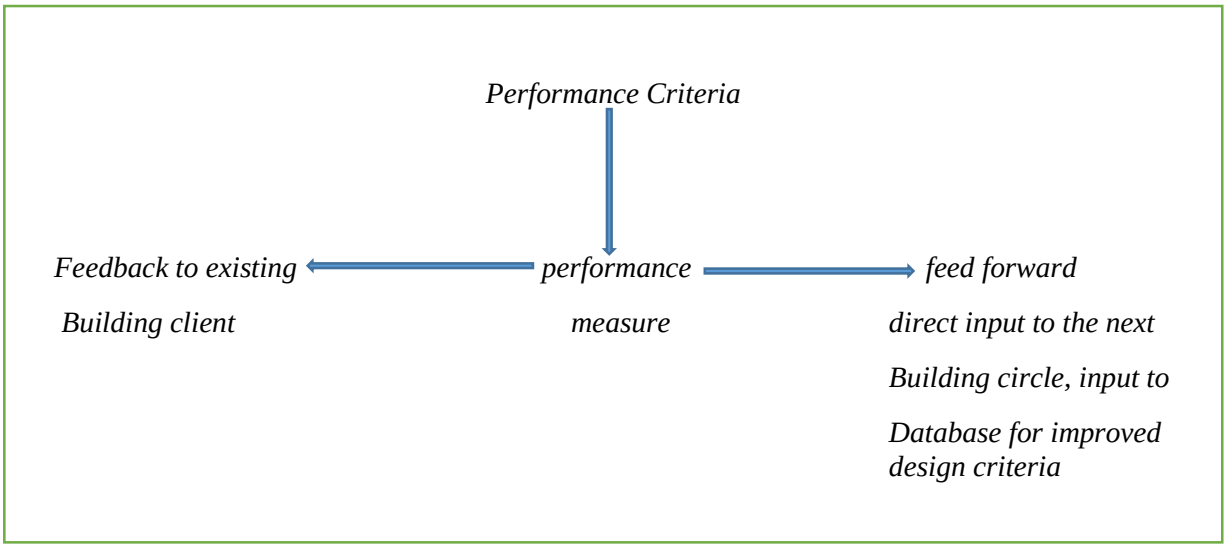

Figure 2.1: Building process and the performance concept.
Source: Amaratunga and Baldry (1998)

POE, as cited by Agyekum *et al.* (2016) is the process of evaluating building systematically and comprehensively after it has been occupied. But very important to note that there is no industry accepted definition for post occupancy evaluation nor is there a standardized method for conducting it (Federal Facilities Council, 2011). However, POE can be defined as any process geared towards determining and improving building performance in relation to users' satisfaction and the built environment (Oladiran, 2013).

One of the commonest protocol of POE that have been used extensively in the last 27 years are Post Occupancy Review of Buildings and Engineering (PROBE) in Great Britain and many countries. The second is the survey tools developed and supported by the Center for the Built Environment at UC- Berkeley (Hewitt *et al*., 2009). Moreover, it has been observed that the application of POE depends largely on the drivers and one of such is users' satisfaction (Oladiran, 2013).

Implementing the use of POE in an organization will help to identify a measurable link between the quality of the building and the performance outcomes of the occupants (Eke *et al*., 2013). It is crucial to conduct a POE because it indicates how well the building is performing in order to satisfy the occupants' needs and achieve organizational goals (Chandrasekar, 2011).

POE was initiated because of the challenges and changes in the building environment due to the fact that even continual improvement was not sufficient to solve the problems that occupants face every day (Karim & Carl, 2014). So POE will then assess to the responses of the occupants with regard to the residential environment where they live every day (Aliyu *et al.*, 2016). The relationship between the building and its occupants must be understood by designers prior to designing the building in order to understand the impact that the building will have on the occupants with regard to workplace set-up, health and safety (Eke *et al*., 2013).

2.2.3 Portfolios of Post Occupancy Evaluation

Portfolio according to Bordass *et al.* (2014) are clarified by dividing POE's according to current five categories, which are as follows

1) Audit: using quantitative technical assessments (e.g. CIBSE TM22 energy assessment and reporting methodology).

2) Discussion: use of discursive techniques such as workshops and interviews. These techniques can discuss what they are about to do (foresight) what they are doing (insight) and what they have done (hindsight).

3) Questionnaire: examples of questionnaire include BUS occupant survey (UK) and the CIC design quality indicators and the overall liking score.

4) Process: techniques that are used to adapt the procurement process to incorporate feedback in an organized manner, e.g. “Soft landings” and the Building Research Establishment checklist.

5) Packages: e.g. Probe (combination of questionnaire and audit POE’s), or AMA Work ware package (incorporates an occupant questionnaire “and tools to study the use of space and time.

2.2.4 Various Types of Post Occupancy Evaluation

As pointed by Eke *et al*. (2013), POE may be classified in three levels

1) The Indicative Post occupancy evaluation

2) Investigative Post occupancy evaluation

3) Diagnostic Post occupancy evaluation

Indicative Post occupancy evaluation gives an indication of the success or failure of the overall building performance. By applying this method, it is easy to collect the data, as one can quickly interview few occupants who will quickly give the results that one wants (Palm, 2007). Investigative Post occupancy evaluation is once the problem has been identified; the POE will start investigation to find out what the problems are (Eke *et al*., 2013). Once the process has been completed, the data will be presented for a solution. But in the aspect of diagnostic POE, at this level the evaluation will be focusing on the critical elements of the building such as the safety of the staircases, lighting and overcrowding in the building

(Chandrasekar, 2011). Diagnostic POE is a comprehensive and very lengthy investigation that is done with care. After conducting this kind of POE, it may take some time to formulate and conclude its findings, probably months or years. The findings of the evaluation will improve the performance of the building (Aliyu *et al.*, 2016).

2.2.5 Importance of Conducting of Post Occupancy Evaluation

In the words of Akinluyi (2013) the value of POE is being increasingly recognized, and it is becoming mandatory on many public projects. 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 (Oladoja, 2015)**.** Although, Evaluation is also an important tool in planning refurbishment of existing buildings (Watson, 2003). It helps clarify perceived strengths and weaknesses in order to focus resources where they are needed. It identifies where building design adjustments are needed to support changing practices, markets, legislation and social trends (Akinluyi, 2013).

2.2.6 Purpose of POE

Post occupancy evaluation highlight any immediate teething problems that can be addressed and solved. It identifies any gaps in communication and understanding that impact on the building operation. It also provide lessons that can be used to improve design, procurement on future projects and act as a benchmarking aid to compare across projects and over time (Akinluyi, 2013).

As the previous section suggests, despite an increasingly encouraging climate for POE to operate, there remains reluctance to engage in any form of systematic evaluation process

from those within the design and construction industry (Fieldson & Sodagar, 2017). It is thus incumbent on those outside the industry to clearly indicate the purpose, and hence the value, of conducting POE as a matter of course. As discussed previously, there are a number of alternative interpretations of POE and, as a result, there are multifarious accounts attesting to the reasoning behind conducting a POE. However, Neilson and Zimmerman (2011) suggest that, despite a proliferation of purposes and reasons "the overarching benefit from conducting POE is the provision of valuable information to support the goal of continuous improvement(Stephen & Zotorvie, 2017). In similar general terms, Whyte and Gann (2003) suggest a number of plausible benefits for conducting a POE, these include:

1) Applying design skills more effectively;

2) Improving commissioning process

3) Improving user requirements;

4) Improving management procedures;

5) Providing knowledge for design guides and regulatory processes

6) Targeting of refurbishment

In general terms, it could be suggested that POE, provides a method of gathering and disseminating 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, in different ways; for instance, Preiser suggests that POE has specific benefits for facilities management (Preiser & Vischer, 2004). Moreover, Many sources suggest that a fundamental shift in the way building procurement usage is perceived, particularly within the

client/developer and design communities, is required in order to truly appreciate the purpose of POE and the resultant benefits that could be accrued (Bordass *et al*., 2002). This shift in perception concerns Zeisel's (1981) proclamation that the design process should be cyclical in nature rather than simply being initiated and concluded in concurrence with a specific design project, as is currently the norm in the current UK construction industry (Agyekum *et al*., 2016). This process of perception involves the notion of an accumulative database of knowledge, which is continually fed by information garnered from specific successes, and failures of particular building types and configurations, using the POE process (Karim & Carl, 2014). Zimmerman and Martin (2001) suggest that POE forms a "logical final step" in this cyclical process, providing a knowledge base of "lessons learned" from users in completed projects which could then be utilised to either improve spaces in existing buildings or form a programming platform for future buildings. (Karim & Carl, 2014)

2.3 POE benefits

Through POE, as noted by Eke *et al*., (2013), designers can discover how similar buildings performs once they are in use, policy makers can also apply it to help in developing and improving on the existing programs and projects being delivered (Watson, 2003). POE is also a valuable tool for assessing building quality, since building designers, owners and even the government, in the case of state subsidized buildings are held accountable for the success or failure of the building and policies creating the buildings (Eke *et al*., 2013).

POE identifies ways people can use buildings and equipment more efficiently and more cost-effectively. POE also eliminates dysfunctional and seldom-used areas in a building and mistakes can be corrected in future design and policies (Darkwa, 2006). The greatest benefits from POEs are determine when the information is made available to as wide an audience as

possible, beyond the organisation whose building is evaluated, to all sector and construction industry (Eke *et al*., 2013). Information from POEs can provide not only insights in to problem resolution but also provide useful benchmarking data to which other people projects can be compared (Barlex, 2006).

On the other hand, (Agyekum *et al*., 2016) thought that the most important benefit of POE is continuous improvement of quality and performance of facilities. This is particularly beneficial in projects with reoccurring construction programs or in which a significant number of facilities are typical (Preiser, 1995), such as a university campus. According to Watson (2003) as cited by Darkwa (2006), there are many benefits of post occupancy evaluation. By understanding how buildings support or inhibit activities, buildings can be fine-tuned and management practices can be adjusted. The smallest adjustments to buildings and the ways these buildings are used. Among the benefits that can result from POE is the identification of successful design features that can be scrutinized recurrently (Mustafa, 2017). These include identification of problems to mitigate or reduce buildings and facilities defects, improvement of building performance and environment, identification of redundant and unnecessary building features, and empowerment of users to negotiate building issue and reduce maintenance work and cost (Hewitt *et al*., 2005).

Designers can capitalize on successful design features and learn to avoid past mistakes. Post-occupancy evaluation is also a valuable tool for assessing building quality, since designers, owners and building managers are held accountable for the success or failure of the building (Darkwa, 2006).

2.3.1 The Basic Approaches to POE

There are numerous approaches to the concept of POE, a wide variety of methodologies have been developed in order to address the specific approaches and outcomes of conducting POE (Ibem *et al*., 2013). Preiser (1995) for example, identifies three approaches that summarise the range of POE that can be applied to the full spectrum of projects, from the minutiae of a specific building, to the overall procurement programme of a whole project. These three approaches are summarised as: Indicative, Investigative and Diagnostic POE (Preiser *et al*., 1988):

1. Indicative POE, it is suggested, are cursory analyses that may include "quick walkthrough evaluations involving structured interviews with key personnel, group meetings with end users as well as inspections" (Preiser, 1995).

2. Investigative POE are considered to be more in-depth analyses, utilizing interviews and questionnaires, usually across a number of buildings of the same or similar type.

3. Diagnostic POE are regarded as being the most sophisticated of the methodologies. They tend to have a broad, system wide focus on a number of comparable facility types, focusing on a broad range of technological and anthropological areas of research. Preiser suggests that this type of in-depth POE produces "high validity and generalisability of data collected that has the potential of being transformed into guidelines" for use in the public realm (Preiser, 1995). The UK based probe study (Derbyshire, 2001) is generally regarded as being an example of this, in-depth, diagnostic POE. it is appropriate to recognise that what made the Probe study distinctive is that it established the possibility for undertaking an extended series of

evaluations using rigorously developed documentation and criteria, and then publishing the results in the public domain (Cohen *et al*., 2001). The distinction of having published the findings of the Probe study in a technical journal is important as it sets a precedent for future publications, being the first of its kind in the UK (Bordass *et al*, 2002).

2.4 An alternative perspective of Post-occupancy evaluation

An alternative perspective on POE's is offered by (Vischer, 2008) who identifies four general typologies:

1) Building behavior research, or the accumulation of knowledge
2) Information for pre-design programming for buildings for which design guides or prototypes may be useful;
3) Strategic space planning i.e. building assessment as part of 'workspace change to bring space more in line with strategic business goals'; and
4) Capital asset management POE as a tool in developing performance measures for built space." In light of the proliferation of techniques/approaches and the varying attempts to categorize these methodologies.

The US Federal Facilities Council (2002) attempted to reconcile the POE approaches into a single, preferred methodology (Bordass & Leaman, 2005). However, such an all-encompassing methodology is now regarded as impossible, as it ignores the specific contexts, needs and resources of the broad range of cultural climates in which POE is utilized (Karim & Carl, 2014).

2.5 POE and quantity surveying

The quantity surveyors, facility manager and other participants in Post Occupancy Evaluation often identify ways to design and use buildings and equipment more efficiently and more cost-effectively. (Watson, 2003).

Dysfunctional or seldom-used building features can be eliminated or replaced and mistakes corrected in future designs, this way money is saved because there will be no need to spend money on renovating or making repairs to the newly designed building (Watson, 2003 as cited by Darkwa, 2006). Often, minor changes to buildings and the ways they are used comes at a significant cost, benefits to users (Ajayi, *et al*, 2015). POE is valuable in all construction sectors, especially healthcare, education, offices, commercial, and housing, in which poor building performance will affect running costs, occupant well-being and business efficiency (Lawrence, 2013).

According to Darkwa (2006) as cited by Aliyu *et al*., (2016) post-occupancy evaluation is an important tool in planning the refurbishment of existing buildings, it helps to clarify perceived strengths and weaknesses of an existing building so as to increase focus on the building where they are needed. It is also used to identify where building design adjustments are needed to support changing practices, markets, legislation and social trends (Darkwa, 2006). Participation in evaluation identifies ways to design and use buildings and equipment more effectively. The way a setting supports or inhibits the occupants' activities will impact on how they relate to the building (Aliyu *et al*., 2016).

2.6 The Concept of Student Housing and Facilities

The hostel is a cheap boarding accommodation facility provided for students (Stephen & Zotorvie, 2017). The hostel accommodation is conceived to keep students within the learning environment to facilitate ease of accessing the education facilities (Philip *et al.,* 2018). Klis van der and Karsten (2008) described it as a dwelling, residence close to workplaces with dual functions: living and private studying. The student hostels, accommodation encourages social interactions among the students at all levels and enhances a lifelong familiarity (Lobatón, 2011).

Hostel accommodation enables heterogeneous students to learn from each other and thereby promoting peer interactions required for human' development (Novek *et al*., 2013). Through daily interactions among the peers the weak learning students improve their understanding ability and become focused as hostel accommodation reduces side attractions inimical to learning activity. The student school environment affords students to participate in many social research activities like sport, use of cafeteria and leadership training opportunities like student union and religion associations purposely for students without any barrier of background or exposure (Owolabi, 2015).

The hostel facilities are meant to provide not only learning convenience, but also to enhance students' behavioral attitude needed for social interactions and leadership purposes (Devi, *et al*., 2015). The provision of hostel accommodations enables the students of diverse culture and exposures to come together and enhances their academic and behavioral attitudes (Nimako & Bondinuba, 2013). Hostel facilities such as common room, parks, recreation garden, cafeteria, and internet cafe on the campuses encourages such attitudinal learning. In recent times, facilities such as campus shuttle-bus, mini-markets, corner shops, public toilets

and security outfit are becoming necessary on the campuses (Owolabi, 2015). Living on the campus as a student in the University makes student's lifestyle more refined and orderly and also gives the student a complete academic experience. The hostel accommodation allows students to learn, worship, and establishes many far reaching good relationship among their peers. Students' accommodation influences their growth, behavior and study performance (Devi *et al*., 2015).

A study conducted by Owolabi (2015) on the effects of Students' Housing on Academic Performance at the University of Ibadan in Nigerian, revealed that hostel accommodation enhances academic success, especially among the students of poor background as it blends this category of students with the brilliant ones, improve students social value through enhanced interactions, expose students to resource management, and prepared students for self-reliance and leadership resilience.

2.7.0 Evaluation of facilities users

Facility users are the occupant of buildings and its amenities (Philip *et al*., 2018). Facilities users are not actually part of the design team. The interaction between the facilities and the users is what determines the satisfaction of the users and users rating of the performance of the facilities. Hakkinen and Nuutinen (2007) in their contribution, observed that if a building is designed without the basic end-user's requirements, it is unlikely to provide a suitable working environment.

They agree that the process of understanding the precise functional requirements of the end-user must begin by embracing every member of the design and construction supply chain including the facilities manager (Olatunji, 2013). They maintain that all the skills workers

involved must have a basic knowledge of the end-user's functional requirement which must be met if the completed building is to be deemed a success (Olatunji, 2013). It is obvious that the functional performance and morale of the occupant/end- user can only be enhanced if the design is a collaborative and integrated effort (Okolie, 2011).

An integrated design or team approach based on a thorough and detailed understanding of the precise functional requirements and interrelated values of the end-user should be adopted (Cain, 2003). The satisfaction of the end-users/occupiers comes from the ability of the building to enhance job/performance and environmental comfort and ultimately boost staff morale (Obiegbu, 2005). Due to the complex nature of buildings to meet up with user's needs, a successful building can be achieved by the collaboration and integration of all the parties involves in the building life-cycle (Osanyinro & Aghimien, 2017). The design and construction of educational facilities in Nigeria hardly involves the participation of end-users which are the students and the staffs, most of the construction projects awarded in the polytechnics were more political, instead of the due-process (Olatunji, 2013).

2.7.1 Measurement of occupant's satisfaction

One common residential satisfaction measurement used in previous studies is the Post-Occupancy Evaluation (Najib *et al*., 2011). Hassanain (2008) points out that student perceptions can be assessed in terms of both technical (i.e., acoustic and visual comfort) and functional (i.e., room finishes and room layout) requirements. He, however, considers technical and functional building performances as two different aspects that can be used to explain student residential satisfaction (Akinluyi, 2013).

Researchers conceives residents' satisfaction as a multidimensional concept, a measure of people's attitudes towards certain aspects of their residential environment (Francescato, 2002). The concept is operationalized as a multi-item index, which is more likely than a single item to constitute a robust criterion variable in multivariate analysis (Agyekum *et al*., 2016). The index consists of five inter-correlated items to which respondents were required to indicate their degree of agreement or disagreement on a 5-point Likert scale, namely:

1) You are generally satisfied with living in this estate.
2) You are satisfied with living in this apartment.
3) You want to live here for a long time
4) If you were to move, will you like to live in another place like this.
5) You will recommend this place to a friend if they were looking for a place to live.

Responses to these five items were summed up to produce aggregate scores. However, relative rather than absolute values of residential satisfaction are more useful as performance criterion. Hence, the responses were further categorized into three classes, namely: satisfied, neutral and dissatisfied. In addition, these summative values were correlated with values of residents' satisfaction derived from more detailed responses in the structured questionnaire (Ilesanmi, 2010).

2.7.2 User satisfaction as a benchmark in building performance evaluation

The factor of the user and occupant is crucial in the whole evaluation process(Mustafa, 2017). Building performance is not limited to energy conservation, life cycle costing, and the functionality of buildings. It also needs to focus (and already does) on users' perspectives on buildings (Mamalougka, 2013).

The relationship between building and user should be investigated, problems and their sources must be identified and factors that influence the level of satisfaction should be determined (Khalil *et al*., 2015). The most important factor, as a benchmark of a building's success in meeting the design objectives, is the level of user satisfaction (Wilkinson *et al*., 2011). Satisfaction studies cut across a wide range of disciplines in the management and social sciences as well as the built environment (Ibem *et al*., 2013).

In general, satisfaction is a subjective evaluation of the performance of products or services in meeting the needs and expectations of users or customers (Parker & Mathews, 2001; (Ueltschy *et al*., 2007). It compares the benefits or values that users or customers derive or expected when a product or service is consumed (Hanif *et al*., 2010). In sum, satisfaction is a measure of the difference between the actual and expected performance of products or services in meeting users' needs and expectations from the users' or consumers' perspectives during or after a consumption experience (Oladoja, 2015). In fact, based on the expectancy-disconfirmation theory, from which most studies on satisfaction draw, if the performance of a duct or service meets users' or customers' needs and expectations, the user or customer is said to be satisfied with the product and/or service, and vice versa (Oliver, 1981; Parker & Mathews, 2001).

Buildings, like any other products, are designed and constructed following many expectations by clients, professionals, users, and the community (Oladoja, 2015). To clients, buildings require huge capital investment and are expected to bring returns on investment, whereas to professionals (e.g., architects, builders, and engineers) buildings are products of their creativity and imaginative thinking. On the part of users and the community, one crucial expectation is that buildings will meet their needs and aspirations by supporting their daily

activities (Preiser, 1999; Davara *et al*., 2006). To this end, Van der Voordt and Maarleveld (2006) noted that building performance evaluation (BPE) assesses the architectural, functional, technical, and economic value of buildings (product evaluation) or building procurement process (process evaluation).

By identifying the major weaknesses and strengths of buildings from the end user's perspective (Preiser, 1999; Khalil & Nawawi, 2008), BPE contributes to improving the quality of buildings and building projects delivery process (Preiser, 1995; Kim *et al*., 2005). In addition, PBE also provides feedbacks on causes and effects of environmental issues that are related to buildings, thereby informing planning and management throughout the building's life cycle (Meir *et al*., 2009) and culminating in the production of sustainable built environment (Zimring, 1988).

BPE is important in understanding the actual performance of buildings in meeting the various expectations of the different stakeholders as compared to predicted performance, and the efficiency of building procurement process (Ibem *et al*., 2013). Accordingly, BPE can be used in assessing different aspects of buildings and building procurement process, and the findings can serve different purposes. Evidently, BPE may be intended for the formulation and implementation of government policies, or the development of new theories or research tools or the dissemination of information on the performance of building spaces and fabrics to professionals, contractors, and material manufacturers in the building industry as well as to the public (Ibem *et al*., 2013).

Mustafa (2017) indicates that in the last few decades, much progress has been made in developing different BPE tools and approaches. The main categories of approaches to BPE, include those approaches that focus on the

1) functional suitability of buildings that is space utilization, physical condition, safety and statutory requirements;
2) quality assessment of buildings;
3) serviceability of buildings with respect to occupants' needs and facilities provided;
4) environmental performance in terms of indoor environmental quality, air quality, intrusion, control, appearance and lighting;
5) energy consumption and indoor air quality;
6) user satisfaction with the design and construction of and services in building;
7) post occupancy evaluation (POE) of technical, functional and behavioral aspect of buildings. A wide range of tools have also been developed for each of these approaches (O'Sullivan *et al*., 2004; Kim *et al*., 2005).

In the last few decades, much research work has also been used for the development of building performance indicators (BPIs). Hasselaar (2003) as cited in Mustafa, (2017) noted that an indicator is a sign that points to a condition to be measured, to evaluate specific qualities and performances. In the context of building, Preiser (1999) as cited in Mustapha (2017) held the view that BPIs should be derived from values held by individuals, groups, organizations, or the entire society who are stakeholders in the building industry, thereby indicating that the criteria for measuring the performance of buildings should be derived from how people see their buildings and the importance that they attach to them. Similarly, Fatoye and Odusami (2009) as cited by (Ajayi *et al*., 2015) proposed that at the inception of building occupation, users hold various expectations on the performance of their building, in terms of the benefits that it will provide and the needs it should meet. The implication of the former is that a building may be perceived by the same people differently at different

times, or differently by different people at same time, and that the expectations of building users and the community are diverse and vary among individuals and groups (Ibem *et al*., 2013).

To capture the feelings and expectations of all categories of users while evaluating the performance of buildings, Kim *et al*. (2005) suggested the adoption of six BPIs, namely; spatial (functional) comfort, indoor air quality, visual comfort, thermal comfort, acoustic comfort, and building integrity (structural and material performance). On the other hand, Meir *et al*. (2009) argued that because BPE is based on the concept of building-users' experience, BPIs should be based on parameters that are related to thermal comfort such as heating, ventilation and air-conditioning; illumination and visual comfort; users' satisfaction and behavior; as well as physiological and psychological comfort of users.

In the light of the above, certain inferences can be made. First, BPE can follow different approaches and diverse tools and indicators can be used. Second, the expectations of users and the community with respect to buildings are diverse and can be measured in terms of performance indicators. Finally, the different approaches to BPE, tools and indicators used contribute to policy, practice and research when they focus on issues that are related to users' satisfaction and the sustainability of buildings and the surrounding physical and socio-economic environment (Ibem *et al*., 2013).

Different tools for BPE are identified in the literature. Existing studies (Nawawi & Khalil, 2008; Ilesanmi, 2010; Jiboye, 2012) have shown that user satisfaction surveys have become a highly valuable tool in assessing the technical performance of buildings and understanding human attitudes, needs, and expectations towards buildings in use. In the same context, Zagreus *et al*., (2004) indicated that the views of building users are important in investigating

the performance of buildings in meeting occupants' needs and expectations. Gupta and Chandiwala (2010) added that the evaluation of performance of built environment has traditionally been based either on physical monitoring or user satisfaction surveys principally because users give their views and/or feelings about buildings-in-use based on their experience and interactions with buildings (Vischer, 2008) as compared to the views of professionals who design and construct buildings and never use them (Preiser, 1995; Khalil & Nawawi, 2008; Chohan *et al*., 2010). It is established that occupants' satisfaction highly correlates with the performance of public buildings, thereby indicating that user' satisfaction has a direct relationship with the overall performance of buildings in meeting the needs and expectations of the users. The existing studies rarely associated users' satisfaction with the performance of university buildings and its facilities at least in the Iraq and Iraqi Kurdistan region. Hence, this study is an attempt to bridge this gap in research (Khalil & Nawawi, 2008).

2.8 POE categories based on building performance elements

The focus of a POE can be considered in terms of three broad categories of performance elements. These categories include the technical performance elements, functional performance elements, and behavioral performance elements (Preiser *et al*., 1988; Blyth *et al*., 2006). These performance elements consist of performance indicators that represent signs, markers, attributes, and items that evaluate specific qualities of an element to be measured.

Performance indicators change based on the evaluation purpose and the case study at hand (Sanni-Anibire *et al*., 2016).

1) Functional performance elements

Functional performance addresses the functionality and efficiency level of the features in buildings and facilities which include accessibility, spatial capacity for activities, and adequacy of necessary facilities. Other elements include utilities, telecommunications, responsiveness to change over time, and efficiency of communication and circulation (Khalil *et al.,* 2015). These elements are directly connected to the activities within a building and are required to be in conformity to the specific needs of the occupants (Preiser *et al*., 1988). This direct connection between a building's functional aspects and the needs of its users is probably the reason for its receipt of noteworthy attention in POE studies (Sanni-Anibire *et al*., 2016).

2) Technical performance elements

Technical performance elements deal with survival attributes, such as structure, sanitation, fire safety, and security (security: the degree of resistance to, or protection from, harm; fire safety: fire resistance of the major structural elements of a building, fire extinguishment and containment, flame spread, smoke generation, the toxicity of burning materials, and the ease of egress in case of a fire), ventilation, and health (Preiser *et al*., 1988). From an environmental perspective, technical performance addresses the issues of indoor environmental quality (IEQ), which affect the comfort, health, and productivity of occupants (Choi *et al*., 2012). IEQ elements include thermal comfort, HVAC system and natural ventilation system), indoor air quality, visual comfort, quantity and quality of lighting, glare,

control of shadows, adequate luminance and acoustical comfort (acoustic comfort relates primarily to providing conditions in a building that facilitate clear communication of speech between its occupants) (Kim, 2005). Noise control can be Performance assessment of buildings via post-occupancy evaluation: A case study of the building of the architecture provided through walls, floors, windows, and doors that provide adequate reduction of sound from adjacent activities (Hassanain, 2008; Sanni-Anibire & Hassanain, 2016).

3) Behavioral performance elements

Behavioral performance elements create a link between occupants' activities and the physical environment (Khalil *et al*., 2015). Typical behavioral performance issues include the effect of area size and number of persons that share it upon a building's occupant, and the effect of functional distance between spaces upon the frequency of use (Khalil *et al*., 2015). Moreover, occupants' comfort is also affected by the configuration of circulation routes on social interaction, and the features that affect the building's image and outlook (Preiser *et al*., 1988; SanniAnibire *et al*., 2016).

2.8.1 POE performance indicators

1) Design quality – DQ

This includes the quality of all architectural attributes of the building such as the design and configuration of space, building location relative to other facilities in the campus, landscape architecture, and general aesthetic appearance (Preiser *et al*., 1988; Sanni-Anibire & Hassanain, 2016) as cited in Mustafa (2017).

2) Building layout

The layout of space, furniture, and storage and the convenient circulation and accessibility to various usable spaces within a building are of utmost importance to residential satisfaction. Spatial attributes, the sequence, location, relationships, shape, size, and detail of spaces have been shown to affect occupant behavior (Preiser *et al*., 1988). The interior layout of the building should be efficient in terms of the arrangement of rooms in each level in the building, the width of the corridors for circulation, and the location and number of stairs (Hassanain, 2008; SanniAnibire & Hassanain, 2016).

3) Interior and exterior appearance

Appearance is one of the most important aspects of building performance. It pertains to the aesthetic perception of the building by the occupants (Preiser *et al*., 1988). Common problems that affect exterior walls are color fading, moisture and wind infiltration, spalling, buckling, delamination, cracking, cleanability, and erosion (Mustafa, 2017). The quality of construction and selection of building materials should be compatible with, and complement, the existing physical environment (Hassanain, 2008; Sanni-Anibire & Hassanain, 2016).

4) Access to facilities on campus – accessibility

This refers to the building's closeness to the facilities on the campus, usually within a walkable distance to teaching, recreational, food-consuming, and car parking facilities (Mustafa, 2017). These facilities include sports facilities, parking lots, campus shuttle stations, worship centers, grocery stores, food courts, medical centers, libraries, and academic buildings (Hassanain, 2008). The location of a building and its proximity to places of interest are major factors in the satisfaction of its occupants (Hassanain, 2008; Fatoye & Odusami, 2009; Sanni-Anibire & Hassanain, 2016).

5) Indoor environmental quality (IEQ)

IEQ of a building is a primary concern at present because it influences the health, well-being, and productivity level of its occupants (Fisk, 2001). IEQ consists of thermal comfort, indoor air quality (IAQ), acoustic comfort, and visual comfort (Sanni-Anibire & Hassanain, 2016).

6) Thermal comfort

ASHRAE 55 (2004) defines thermal comfort as "the state of mind that expresses satisfaction with the surrounding thermal environment." The major influencers of thermal comfort in an indoor space are the HVAC system and natural ventilation system through windows and other openings (Mustafa, 2017). Thus, comfort will be determined by the ability to control both systems (Sanni-Anibire *et al*., 2016; Sanni-Anibire & Hassanain, 2016).

7) Indoor air quality

IAQ is the quality of air within a facility or the built environment (Mustafa, 2017). Anderson *et al*. (2014) define IAQ as the comfortable range of the temperature, humidity, ventilation and chemical or biological contaminants of the air inside a building. The major concern is indoor air pollution, which can be the cause of asthma, allergies, and irritation(Mustafa, 2017). Two of the most dreaded implications of poor IAQ are sick building syndrome (SBS) and building-related illnesses (BRI) (SanniAnibire *et al*., 2016; Sanni-Anibire & Hassanain, 2016).

8) Acoustic comfort

Acoustic criteria cover the ambient level of sound, the transmission of sound between areas and rooms, reverberation, and specific areas such as machine noise and auditorium acoustics (Preiser *et al*., 1988). Indoor and outdoor factors influence acoustical comfort. Although indoor factors can be controlled, outdoor factors are the primary causes of discomfort, and

its control depends on the filtering level of the building envelope (Sanni-Anibire *et al*., 2016; Sanni-Anibire & Hassanain, 2016).

9) Visual comfort

The Illuminating Engineering Society of North America (IESNA, 2000) defines visual comfort as an essential human need that can affect task performance, health and safety, and mood and atmosphere. The design of buildings and facilities creates balance between artificial and day lighting, whereby sufficient natural light is allowed through transparent parts of the building envelope (Hassanain, 2008; Sanni-Anibire & Hassanain, 2016).

10) Security and fire safety

Security is defined as the degree of resistance to, or protection from, harm. It applies to any vulnerable and valuable asset, such as a person, dwelling, community, nation, or organization (Garcia, 2007). Fire safety is one of the earliest elements to be evaluated systematically, likely because of enormous concerns for life and property (Mustafa, 2017). Relevant criteria include the fire resistance of the major structural elements of a building, fire extinguishment and containment, flame spread, smoke generation, the toxicity of burning materials, and the ease of egress in case of a fire (Preiser *et al*., 1988). Security and fire safety are usually treated together as one technical performance element because of their role in the protection of life and the property from disastrous events (Sanni-Anibire *et al*., 2016).

11) Quality of building support services – QBSS (serviceability)

Building services and infrastructures are an integral part of the built environment and a major influence on educational satisfaction and quality of life of occupants (Mustafa, 2017). They include water supply, washrooms and water closets, laundry, information technology, and

electrical services (Ibem, 2011; Hassanain, 2008). These facilities should be properly designed, installed, maintained, and managed. Services, such as electricity supply and warm water, must be adequate for the level of use. The availability and adequacy of these facilities coupled with the issues of the cleanliness of washroom facilities are of utmost concern (Hassanain, 2008)

2.8.2 Building Performance Criteria

Ilesanmi (2010) studied the ten (10) performance criteria developed and used in Post-occupancy evaluation and resident's satisfaction with public housing are namely:

1. External visual quality of buildings (ViQ): the evidence of, and general state of the external finishing, such as renderings and painting.
2. Maintenance quality of buildings (MtQ): the evidence and extent of renovations and improvement of buildings/apartments by the residents.
3. Structural quality of buildings (StQ): evidence of durability, stability and long-term integrity in terms of structure, fabrics and materials.
4. Detailing quality of buildings (DQ): the detailing and performance of the operational elements, such as doors, windows, ceilings, roofing members and fascia boards.
5. Quality of building services and (QSv): availability and quality of amenities and conveniences, such as sanitary, water supply, refuse and sewage disposal.
6. Quality of estate roads (Qrd): whether or not they were tarred, condition of surface, kerbs and drainage; and efficiency of vehicular circulation.
7. Quality of landscaping (QLs): evidence of designed landscape and their condition.

8. Quality of semi-public open spaces (Qos): existence, condition, layout, and efficiency of open spaces between blocks of housing units for recreation and socialization; and indoor-outdoor spatial relationships.
9. Quality of environmental layout (Qen): an overall image of neatness, orderliness, layout efficiency, pedestrian circulation and street quality.
10. Quality of the location (QLc): describes how the estate relates with the surrounding neighborhoods (Is it isolated, integrated or dominated?).

2.8.3 Building Performance Attributes

Attributes

Attributes are indicators through which performance of a facility can be measured. Sarel-Lavy *et al.* (2011) highlighted that these attributes vary depending on the type of facility and the purpose of performance evaluation. The selection of attributes also depends on the type of users such as occupants, managers, and supervisors (Gopikrishnan & Topkar, 2017). The choice of attributes should be made in such a manner that they are useful in holistic as well as assessment of general as well as any specific aspect of a facility (Gopikrishnan & Topkar, 2017).

Literature survey on building performance evaluation indicates that a number of researchers have selected attributes and have done grouping of these attributes differently depending on the purpose for which the evaluation is undertaken of the building (Gopikrishnan & Topkar, 2017). While measuring satisfaction of residents in a housing colony, Mohit and Azim (2012) grouped 46 attributes in four components viz. housing and physical features, services provided within housing area, public facilities provided and social environment within housing area. While assessing maintenance aspects of a high rise office building complex,

Nik-Mat *et al.* (2011) grouped 16 attributes in three different heads viz. functional, technical and image characteristics.

Ibem *et al.* (2013) listed 27 attributes under five factors while carrying out performance evaluation of residential buildings. Khalil *et al*. (2010) identified 19 attributes for building performance while carrying out post occupancy evaluation of public buildings. Meng and Minouge (2011) had used 11 indicators while measuring maintenance performance of buildings. Hashim *et al*. (2012) had identified 10 attributes in four heads namely space, comfort, serviceability and safety. Case studies of Abdul Lateef *et al*. (2011) and Shohet *et al*. (2003) were also referred to, wherein the performance of a built facility is assessed based on a number of attributes without specifically grouping them. The methodology for all such assessments has been to conduct questionnaire survey to obtain feedback from concerned stakeholders. In all these methods, there is a scope of bringing more objectivity in response of the users by improving the manner in which the questions are put across to the participants in the user satisfaction surveys (Gopikrishnan & Topkar, 2017).

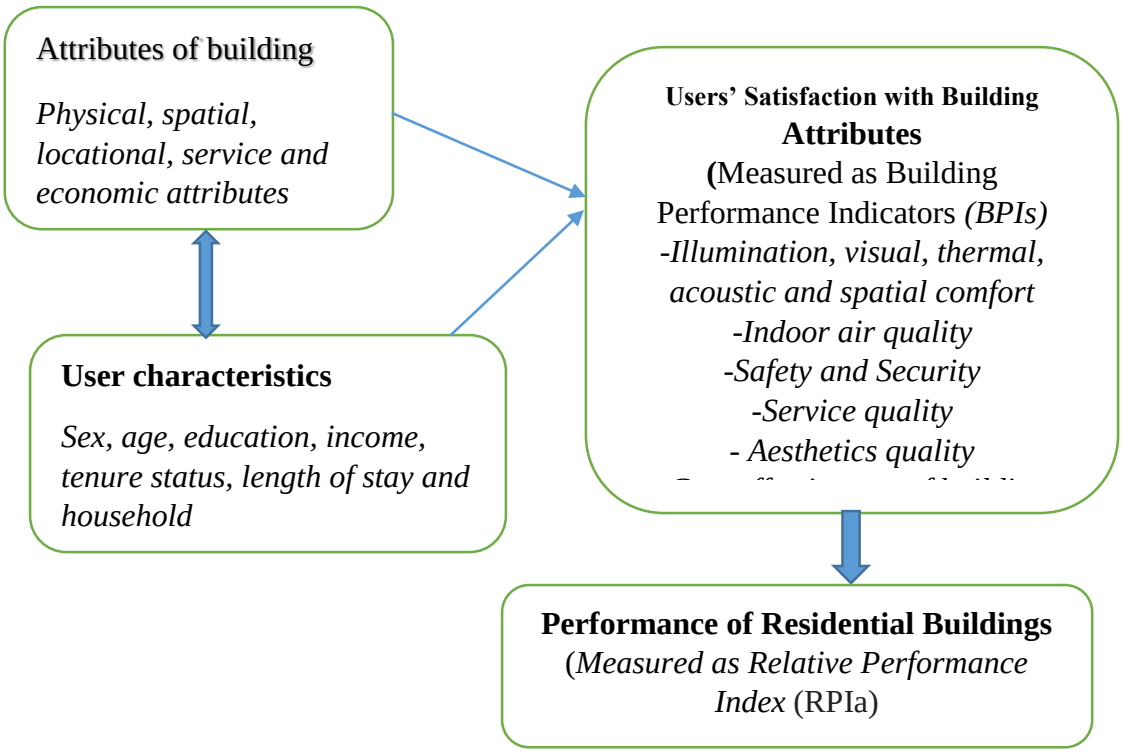

Figure 2.2: Conceptual framework of the building performance evaluation

Source: Adapted from Ibem *et al*. (2013)

2.9.0 Review of Building Performance Evaluation Likely Questions

In order to avoid recipient fatigue and an overload of information. Cohen *et al*. (2001) identify 12 topics on which questions would normally be asked, these included: physical conditions within the environment (lighting, noise, air: movement, quality and temperature), personal control over the physical conditions, management response to complaints, health and overall comfort productivity, background and the overall quality of the building (Cohen *et al*., 2001).

The justification for this, relatively short, questionnaire concerns the management of the data produced from the survey. Cohen *et al.* (2001) suggest that many such surveys suffer data

bloat where there is too much data and not enough time to process the information for meaningful analysis.

Finch (1999) also offers an alternative perspective through the exploration of what is described as empathetic design. In this scenario, those undertaking a POE are encouraged to use expert direct observation of the users in whatever building context is under examination. A similar approach is offered by David Whitemyer's (2006) article "Anthropology in design", in which he explores the notion of using observational methodologies as part of the POE process. The suggestion here is that ethnography is the best route to understanding how people relate to their environments (Whitemyer, 2006) as it involves a more enriching process of observation. This process of observation provides a more enhanced account of the activities that are performed in any given space (Karim & Carl, 2014). For example, although a POE questionnaire can focus on a particular action or activity by a user, ethnographic observation can provide richer contextual data about how that activity was carried out and what other interactions occurred during the process (Karim & Carl, 2014).

It is in other words, the difference between asking people to explain what they are doing versus watching them doing it (Whitemyer, 2006). Ethnography, therefore, could be seen to enhance the POE processes previously mentioned, arguably allowing for a more objective study of the complexities of human interaction in any given environment. However, there are some negative issues relating to the cost of carrying out ethnographic studies and the lack of measurable (quantifiable) information, which mean that such an approach has, thus far, only been used in environments where the findings can be generalised (Karim & Carl, 2014).

2.9.1 Building performance evaluation question formats

The contents of a questionnaire comprise of many sections such as basic information, observation schedule, and technical content. The technical content of the questionnaire comprises of questions based on the attributes that indicate the performance of building satisfying user needs, expectations and aspirations (Gopikrishnan & Topkar, 2017).

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This section presents the methodology used for this research. It included the research design, population for the study, sampling frame, sampling size, sampling techniques, procedure for data collection and procedures for data analyses and presentations.

3.2 Research Design

The research design acts as a map of action and a blueprint for data collection, measurement, and analysis (Reza, 2018). It also constitutes the measurement of analysis and collection of data. Clear research problem determines the type of research design (Ali, 2018). The study adopts a survey research design. A survey research design is a descriptive study, which uses samples of a population to document, describe and explain what is in existence or non-existence of the present status of phenomena being investigated (Reza, 2018). In survey studies, views and facts are collected through questionnaires or interviews which are analyzed and used for answering research questions (Ali, 2006). The survey research design is suitable for this study, as data were collected through questionnaires from the building managers, and users of the facility.

3.3 Population of the Study

A research population is generally a large collection of individuals or objects that is the main focus of a scientific query (Mohammed, 2017). Population can be defined as all people or items (unit of analysis) with the characteristics that one wishes to study. The unit of analysis may be a person, group, organization, country, object, or any other entity that you wish to

draw scientific inferences about (Bhattacherjee, 2012). The population for the study consist of 53 public boarding secondary schools in Niger State out of which 39 are conventional based where sciences, commercial and art courses are offered. Twelve (12) public secondary school buildings were sampled with 4 each picked from the 3 senatorial zones of the state.

3.4 Sampling Frame

This is the process of defining the population, a selection of a representative of the population. It can also be defined as the complete list of the population from which the sample is selected (ResearchLifeLine, 2012). More also, Sampling frame according to Carl *et al.* (2011) is the source material or device from which a sample is drawn. For this study, the sample frame will consist of the facility managers in this case the house masters and the senior students which were drawn from four public boarding schools each across the three senatorial zones in Niger state.

Table 3.1: Sample frame of the study

Respondents (from 12 school buildings)	Numbers
Facility managers (4 X 12)	48
Student Users (30 X 12)	360
Total	408

3.5 Sample Size

Sample size refers to the number of individual pieces of data collected in a survey. It measures the number of individual samples measured or observations used in the survey. A sample size is a part of the population chosen for an experiment (Andale, 2016). It is important in determining the accuracy and reliability of a survey's finding (Zambouni, 2018). this is a small subjects or event or objects taken from a large group called population or universe. The use of formula was adopted for this study as the population is fairly large. Table 3.1 and 3.2 shows the sample frame and sample size for this research. The sample size in respect to both categories of respondents was determined using the formulae;

$$S = \frac{N}{1+N(e)^2}$$

$$\mathbf{S = \frac{408}{1+408(0.05)^2} = 218}$$

Where, N= Number of respondent, e=5% level of precision which is $\pm$ 5%. Yamane (1986)

Table 3.2: Sample size of the study

Respondents	Numbers
Facility managers	36
Student Users	182
Total	**218**

A total of 187 questionnaires were retrieved out of the 218 distributed. 186 were found useful for the analysis, as one (1) was discarded after being declared invalid because of incomplete

response. The 186 represents an effective response rate of 85.32%. The response rate of 85.32% is adequate according to Peter *et al*. (2019), who obtained a response rate of 41.45% and declared that it was adequate for the analysis of data gathered. It was earlier reported that in a questionnaire survey, if the returns rate is within 20-30% or even above (Akintoye, 2000). data is ideal for further analysis. Based on this, it was concluded that the response rate obtained in this study is adequate

3.6 Sampling techniques

According to Morenikeji (2006) sampling technique guides the researcher in selecting element that form part of the population. Some of the common methods are: Probability sampling such as simple, stratified, systematic, random, and a cluster sampling method where the probability of an element being stated is known. Non probability sampling like purposive sampling, quota sampling, convenience sampling, and snowball sampling method in which the researcher is not looking for the representativeness of the sample (Explorable, 2009). Convenience sampling is a type of non-probability sampling method where the sample is taken from a group of people easy contact or easy to reach while stratified random sampling involves a method where a larger population can classified into smaller groups that don't overlap but represent the entire population together (Center for Innovation in Research and Teaching, 2014). Therefore, for the purpose of this study, a mixture of stratified sampling and convenience sampling method were used. In this case the respondents were grouped into classes and selected. A mixture of this sampling procedure was adopted to achieve better accuracy of results.

3.7 Method of Data Collection

The questionnaire developed for this study comprised of questions with closed-ended questions and provided a set of answers from which the respondent must choose. The questionnaires were divided into two sections A and B. The section A request profiles of respondents. The section B part raised questions on the core objectives of the research. Section B Part A raised question on the condition and performance level of some hostel buildings of some selected secondary school in Niger State. Section B Part B raised questions on the levels of user's satisfaction on the building attributes. The research method is quantitative which is in line with the positivist paradigm. It is quantitative because a structured questionnaire containing a list of literature based information prepared by the researcher and administered to the respondents. This helps to validates information from the literature in determining the frequencies and percentages of occurrence. The results of the questionnaire were the only research data utilized in the study.

3.8 Method of Data Presentation and Analysis

After collecting the information from the respondents via the structured questionnaire, the data gathered were carefully analyzed in relation to the stated objectives. The data were analyzed using descriptive statistical method (Relative Importance Index, Percentile and Ranking Method) which were found in the Statistical Package for Social Science (SPSS) version 16.

The analysed data were presented in the form of tables and charts. The use of the Relative Importance Index will help in establishing the significance of user satisfaction with the building while using the performance attributes or criteria. Relative Importance Index is a

useful technique to calculate the relative importance of predictors (independent variables) when independent variables are correlated to each other.

The relative importance index method (RII) is used here to determine respondents' perceptions on the relative levels of user's satisfaction while the ranking method were used to determine the performance level of the building.

$$RII = \frac{\sum W}{A\ X\ N}$$

Where:

W = the weight given to each factor by the respondents and it ranges from 1 to 5

A = the highest weight = 5

N = the total number of respondents

It is meaningful to know that the nearer the value of the Relative Importance Index of the identified factor is at 1 or 100%, the more significant it is and hence, a greater impact on the rest of the variables.

The analysed data will be presented using tables, pie charts and bar charts.

3.8.1 Cut-off point for determining level of significance/satisfaction/important.

The cut-off points shown in columns 4 and 5 of table 3.3 were modified and adopted for this study from the study of Saidu and Shakantu (2016). These authors examined the effects of material-waste and their control measures on project-cost overruns at the site-management stage of a project, and developed a cut-off point for making decision.

Table 3.3 Cut-off point for decision on RII

S/N	Cut-off point (by Saidu and Shakantu, 2016)	decision	Modified Cut-off point (for this study: decision on RII)	decision
1	90% to 100%	Very High (VH)	0.90 -1.00	Very Good (VG)/Strongly satisfied
2	70% to 89%	High (H	0.70 - 0.89	Good (G)/ Satisfied
3	50% to 69%	Moderate (M)	0.50 - 0.69	neutral (N)/Moderately satisfied
4	30% to 49%	Little (L)	0.30 - 0.49	Poor (P)/Dissatisfied
5	1% to 29%	Very Little (VL)	0.01 - 0.29	Very poor (VP)/Strongly Dissatisfied

Source: Modified from Saidu and Shakantu (2016)

CHAPTER FOUR

4.0 DATA PRESENTATION AND ANALYSIS

4.1 Demographic characteristics of Respondents

Table 4.1 shows the result of the analysis of the demographic characteristics of respondents. The result shows that, gender; 56.45% of them are males and 43.55% are females.

Regarding the age of the respondents; majority (83.33%) are between 15-24years of age. In terms of category; students form the bulk of the respondents with 83.33% and facility managers/house master 16.67%. The class of students that participated in the study shows that senior students (SS II) which represent 40.79% are more, followed by SS III (32.89%), and finally SS I (26.32%).

The senior students were considered more mature enough to be conscious of their environment to make reasonable contribution and provide valid information that would aid the achievement of the research objectives. Adequate representation of the facility managers/house masters were considered to aid the provision of valid and reliable details regarding the subject under consideration.

Table 4.1: Demographic characteristics of Respondents

Category	Classification	Freq.	Percent	Valid Percent	cumm. Percent
Respondents gender	Male	105	56.45%	56.45%	56.45%
	Female	81	43.55%	43.55%	100.00%
	TOTAL	**186**	**100.00%**	**100.00%**	
Age bracket of respondents	15-24 years	155	83.33%	83.33%	83.33%
	25-34 years	5	2.69%	2.69%	86.02%
	35-44years	6	3.23%	3.23%	89.25%
	45 years and above	20	10.75%	10.75%	100.00%
	TOTAL	**186**	**100.00%**	**100.00%**	
Category of respondents	Facility managers/ house master	31	16.67%	16.67%	16.67%
	Students	155	83.33%	83.33%	100.00%
	TOTAL	**186**	**100.00%**	**100.00%**	
class of students	SS I	41	26.32%	26.32%	26.32%
	SS II	63	40.79%	40.79%	67.11%
	SS III	51	32.89%	32.89%	100.00%
	TOTAL	**155**	**100.00%**	**100.00%**	

4.2 Condition and performance level of the hostel building in some public secondary schools

The result of the analysis of the data gathered on the Condition and Performance level of the Hostel Building in the Selected Public Secondary Schools is shown on table 4.2. Utilising the RII scores and cut-off point set for determining the condition and performance level of the variables building parameters, the raking and decisions on each of the variables were made.

The results under each of the performance indicators show that: Under the functional performance; performance indicators such as level of access (connection between the

rooms), condition of box rooms, ceiling and walls are in good condition with RII of 0.748, 0.725, 0.723 and 0.715 respectively. This also implies that the performance level of access, box rooms, ceiling and walls are high representing 1st,2nd, 3rd and 4th respectively on the ranking table.

Seven (7) items fell with the range (0.50-0.69) indicating neutral (which implies manageable/fair) condition and performance level. What this means is that this items are in poor but manageable condition and performance. Four (4) items fell within the range 0.30-0.49 indicating poor condition and performance level. These items are; condition of laundries, toilets and bathrooms, measure of Physical safety of students against falling and tripping and floor finishes with RII of 0.386, 0.391, 0.443 and 0.492 respectively which represent number 15th,14th, 13th and 12th on the ranking table. It can be concluded that 73.33% of the student's hostels sampled have functional performance issues. This is evident in the number of variables that are in manageable and poor conditions and performance level. Thus, the condition and performance level ranges from poor – moderate.

Under the technical performance there are 14 items; and 6 (42.86%) of them are in good condition. These items are; Size of hostel rooms with RII of 0.736, Connection between toilets, bathrooms and laundries with RII of 0.768, Fence height RII of 0.709, space outside rooms with RII of 0.702, size of toilets and bathrooms with RII of 0.729 and size of box rooms with RII of 0.715. Thus, the performance level of these variables is high. Five (5) items (35.71%) fell with the range 0.50 - 0.69 indicate neutral (which implies manageable/fair) condition and performance level. What this means is that these items are in poor but manageable condition and performance level.

Three (3) which represent (21.42%) of the items fell within the range 0.30-0.49 indicating poor condition and performance level. This items are Aesthetics (beauty within and outside the rooms), measure of general maintenance and ceiling height with RII of 0.441, 0.327 and 0.480 respectively. It can be concluded that 57.14% of the student's hostels sampled have technical performance issues. This is evident in the number of variables that are in manageable and poor conditions and performance level. Thus, in the same line, the condition and performance level ranges from poor – moderate.

Under the Indoor Environmental Performance there are 8 items and 100% of them are in a poor but manageable condition and performance level; requiring one form of maintenance or the other. Thus, 100% of the student's hostels sampled have Indoor Environmental Performance issues. This is evident in all the number of variables that are in manageable and poor conditions and performance level. Thus, the condition and performance level ranges from poor – moderate.

Overall, there are eleven (11) variables in good condition and performance level; the variables are condition of wall finishes with (RII = 0.711), condition of ceiling with (RII = 0.723), Access with (RII = 0.748), condition of box rooms with (RII = 0.725), size of hostel rooms with RII 0.736, size of box rooms with (RII = 0.715), size of toilets and bathrooms with (RII = 0.729), space in corridors and frontage with (RII = 0.702), connection between toilets, bathroom with RII of 0.768 and Fence height with (RII = 0.709), and natural lightening level with (RII = 0.759). These items may not need any form of maintenance soon. These items represent only 29.73% of the performance indicators. The items that fell under the poor but manageable condition and performance level are 16, representing 43.24%.

These items show that student hostels in the study areas would need maintenance work. 10 (27.02%) of the items are in a poor state and would require immediate maintenance work. Among them are; floor finishes (RII = 0.492), toilets and bathrooms with (RII = 0.391), laundries with (RII = 0.386) aesthetics with (RII = 0.441) and artificial lightening with (RII = 0.306).

Table 4.2. condition and performance level of the hostel buildings

S/No	Performance Indicators	RII	Rank	Overall rank	Decision
A	**Functional Performance**				
1	What is the condition of the walls of the hostel you live?	0.711	4th	10	Good
2	Condition of the roof covering (zinc cover in the roof)	0.667	6th	13	Neutral
3	State of finishes (plaster, paint) on the room walls	0.633	8th	19	Neutral
4	State of the floor finishes (floor screed or tiles)	0.492	12th	28	Poor
5	Condition of the ceiling	0.723	3rd	09	Good
6	Level of access (connection between the rooms)	0.748	1st	03	Good
7	Safety and security from insects and fire accidents	0.553	10th	21	Neutral
8	Electrical safety from loosed fittings or wires	0.595	9th	20	Neutral
9	Physical safety of students against falling and tripping	0.443	13th	31	Poor
10	Condition of rain water drainage	0.539	11th	25	Neutral
11	Protection against insects	0.669	5th	15	Neutral
12	General condition of box rooms	0.725	2nd	8	Good
13	Shape of doors and windows (fittings, frames, glazing)	0.635	7th	18	Neutral
14	General condition of toilets and bathrooms	0.391	14th	36	Poor
15	General condition of the laundries	0.386	15th	27	Poor
B	**Technical Performance**				
16	Size of your hostel rooms	0.736	2nd	2	Good
17	Size of box rooms	0.715	4th	7	Good
18	Size of toilets and bathrooms	0.729	3rd	9	Good
19	Size of laundry	0.615	7th	18	Neutral
20	Doors and windows positioning to aid escape in case of emergencies situations	0.575	10th	21	Neutral
21	Spaces within the rooms and lobby to ease movement	0.558	11th	25	Neutral
22	Space outside rooms e.g. corridors and frontage	0.702	6th	13	Good
23	Aesthetics (beauty with and outside the rooms)	0.441	13th	31	Poor

Table 4.2 cont'd

24	General building maintenance of the hostel	0.327	14th	35	Poor
25	Location of the hostel building	0.577	9th	23	Neutral
26	Location of toilets, bathrooms and laundries	0.614	8th	19	Neutral
27	Connection between toilets, bathrooms and laundries	0.768	1st	1	Good
28	Ceiling height	0.480	12th	33	Poor
29	Fence height	0.709	5th	15	Good
C	**Indoor Environmental Performance**				
30	Natural lighting level	0.759	1st	5	Good
31	Artificial lightening (bulbs)	0.306	6th	29	Poor
32	Quality of air within the rooms from doors and windows	0.678	2nd	6	Neutral
33	Quality of air within toilets and bathrooms	0.279	8th	32	V. Poor
34	Quality of air within the laundry	0.538	5th	24	Neutral
35	Noise from the other rooms	0.649	3rd	10	Neutral
36	Noise from outside the building	0.549	4th	14	Neutral
37	Cooling condition within the rooms and corridors	0.352	7th	30	Poor

4.3 Determination of the level of user's satisfaction in terms of functional performance, technical performance and indoor environmental quality.

The result of the analysis of the data gathered on the levels of user's satisfaction in terms of functionality, technicality and indoor environmental quality is shown on table 4.3. Utilising the RII scores and cut-off point set for determining the level of user's satisfaction on the condition and performance of the variables of building parameters, the raking and decisions on each of the variables were made.

The results under each of the performance indicators show that: Under the functional performance, 3(20%) items out of 15 shows that they occupant are satisfied. These items

are: Roof covering (zinc cover in the roof) (RII = 0.723), Condition of ceiling (RII = 0.703), Protection against insects (RII = 0.785). Nine (9) items which represents 60% of the items fell with the range 0.50 - 0.69 indicating moderate level of satisfaction. What this means is that these items are in fair and manageable condition and performance. therefore, a level of satisfaction can be derived from their use while three (3) items shows that the occupants are dissatisfied. These items are state of floor finishes, condition of toilets and condition of laundries. It can be concluded that 80% of the students' hostels sampled have functional performance issues and therefore, with moderate level of satisfaction.

Under the technical performance there are 14 items; and 3 (21.43%) of them shows high level of user satisfaction. These items are; Size of toilets and bathrooms (RII = 0.823), Fence height (RII = 0.724), and Size of laundry (RII = 0.704). six (6) items (42.86%) fell with the range 0.50 - 0.69 indicating moderate level of satisfaction. What this means is that these items are in poor but in a manageable condition and performance level, therefore, a level of satisfaction can be derived from their use. five (5) items (35.71%) items fell within the range 0.30-0.49 indicating dissatisfaction. These item are Doors and windows positioning to aid escape in case of emergencies situations (RII = 0.484), Size of hostel rooms (RII = 0.478), Space outside rooms e.g. corridors and frontage (RII = 0.477), Aesthetics (RII = 0.462), ceiling height (RII = 0.496). It can be concluded that 78.57% of the students' hostels sampled have some technical performance issues. This is evident in the number of variables that shows dissatisfaction and moderate satisfaction level. Thus, the level of user satisfaction ranges from low – moderate.

Under the Indoor Environmental Performance there are 8 items and 87.50% of them whose moderate level of satisfaction. This implies that they require one form of maintenance or the

other. Only 2 (12.5%) item shows dissatisfaction. This item is; Quality of air within the rooms from doors and windows (RII = 0.481) and quality of air within the toilets and bathrooms with (RII = 0.318). Thus, it can be concluded that 100% of the students' hostels sampled have Indoor Environmental Performance issues. This is evident in all the number of variables that indicated moderate satisfaction and dissatisfaction level. Thus, the level of user satisfaction level ranges from low – moderate.

Overall, the part /area of the hostel building with satisfactory condition or performance level; Size of toilets and bathrooms (RII = 0.823), Protection against insects (RII = 0.785), Fence height (RII = 0.724), Condition of the roof covering (zinc cover in the roof) (RII = 0.722), Size of laundry (RII = 0.704), and Condition of the ceiling (RII=0.703). These 6 variables represent only 16.22% of the total variables assessed.

The items that fell under the poor but manageable satisfactory level are 21. This represent 56.76% of the components assessed. This shows that student hostels in the study areas would need maintenance work. Ten (10) items (27.03%) of the items are in a dissatisfactory state and would require immediate maintenance work. These are: Doors and windows positioning to aid escape in case of emergencies situations (RII = 0.484), Quality of air within the rooms from doors and windows (RII = 0.481), Size of hostel rooms (RII=0.478), Space outside rooms e.g. corridors and frontage (RII = 0.477), state of floor finishes (RII = 0.432), condition of toilets and bathrooms (RII = 381), condition of laundries (RII = 0.406), Aesthetics (RII = 0.462), Ceiling height (RII = 496) and quality of air within toilets and bathrooms (RII = 318). What the overall result represents is that 83.78% of the components are in a stated that can best be described as dissatisfactory but still manageable. Thus, the level of satisfaction ranges between low to moderate.

Table 4.3. The levels of user's satisfaction using the three performance indicators

S/No	Performance Indicators	RII	Rank	Overall rank	Decision
A	**Functional Performance**				
1	What is the condition of the walls of the hostel you live?	0.602	7	16	Moderately satisfied
2	Condition of the roof covering (zinc cover in the roof)	0.723	2	4	Satisfied
3	State of finishes (plaster, paint) on the room walls	0.622	4	11	Moderately satisfied
4	State of the floor finishes (floor screed or tiles)	0.432	13	34	Dissatisfied
5	Condition of the ceiling	0.703	3	6	Satisfied
6	Level of access (connection between the rooms)	0.604	6	15	Moderately satisfied
7	Safety and security from insects and fire accidents	0.563	9	19	Moderately satisfied
8	Electrical safety from loosed fittings or wires	0.562	10	20	Moderately satisfied
9	Physical safety of students against falling and tripping	0.620	5	13	Moderately satisfied
10	Condition of rain water drainage	0.584	8	18	Moderately satisfied
11	Protection against insects	0.785	1	2	Satisfied
12	General condition of box rooms	0.560	11	21	Moderately satisfied
13	Shape of doors and windows (fittings, frames, glazing)	0.539	12	25	Moderately satisfied
14	General condition of toilets and bathrooms	0.381	15	36	Dissatisfied
15	General condition of the laundries	0.406	14	35	Dissatisfied
B	**Technical Performance**				
16	Size of your hostel rooms	0.478	12	31	Dissatisfied
17	Size of box rooms	0.621	6	12	Moderately satisfied
18	Size of toilets and bathrooms	0.823	1	1	Satisfied
19	Size of laundry	0.704	3	5	Satisfied
20	Doors and windows positioning to aid escape in case of emergencies situations	0.484	11	29	Dissatisfied
21	Spaces within the rooms and lobby to ease movement	0.540	8	24	Moderately satisfied
22	Space outside rooms e.g. corridors and frontage	0.477	13	32	Dissatisfied
23	Aesthetics (beauty with and outside the rooms)	0.462	14	33	dissatisfied

Table 4.3 cont'd

24	General building maintenance of the hostel	0.504	9	27	Moderately satisfied
25	Location of the hostel building	0.544	7	22	Moderately satisfied
26	Location of toilets, bathrooms and laundries	0.683	4	7	Moderately satisfied
27	Connection between toilets, bathrooms and laundries	0.623	5	10	Moderately satisfied
28	Ceiling height	0.496	10	28	Dissatisfied
29	Fence height	0.724	2	3	Satisfied
C	**Indoor Environmental Performance**				
30	Natural lighting level	0.538	6	26	Moderately satisfied
31	Artificial lightening (bulbs)	0.542	5	23	Moderately satisfied
32	Quality of air within the rooms from doors and windows	0.481	7	30	Dissatisfied
33	Quality of air within toilets and bathrooms	0.318	8	37	Dissatisfied
34	Quality of air within the laundry	0.665	2	9	Moderately satisfied
35	Noise from the other rooms	0.617	3	14	Moderately satisfied
36	Noise from outside the building	0.678	1	8	Moderately satisfied
37	Cooling condition within the rooms and corridors	0.601	4	17	Moderately satisfied

4.4 Correlation between the level of building performance attributes and the user's satisfaction level

Correlation analysis was further carried out to ascertain if there is a significant relationship between level of building performance attributes and users' satisfaction level. The result of the correlation analysis is shown on Table 4. The result recorded from the analysis was achieved using Pearson's (r) correlation; the R-value indicates the strength of the relationship. The results showed that there is a significant relationship among the variables tested and P value < 0.05.

However, the relationship between level of building performance attributes and users' satisfaction level showed a low correlation as the R-value fell below the range recommended for high and moderate correlation. Oyewobi *et al*. (2011) cited Hikkles *et al*. (1998) who recommended that a correlation coefficient (r) is high when it ranges from 0.70 to 0.90; and moderate when it ranges from 0.50 to 0.70.

The correlation between the level of building performance attributes and users' satisfaction level is low because (13.25%) implies a positive, but weak statistical relationship between the two set of variables. The P-value of 0.000 observed was less than 0.05, based on these, the hypothesis which states that there is no statistically significant correlation between level of building performance attributes and users' satisfaction level is rejected. Although, the relationship is weak, but the positive value obtained indicates that as the condition of the hostels are changing, there will be a corresponding change in the satisfaction level of the occupants. Thus, low correlation recorded in this study reflect the level of understanding and intelligence of the students' samples.

Table 4.4: Relationship between building performance and the user's satisfaction level

		performance level	satisfaction level
performance level	Pearson Correlation	1	0.364**
	Sig. (2-tailed)		0.000
	N	37	37
satisfaction level	Pearson Correlation	0.364**	1
	Sig. (2-tailed)	0.000	
	N	37	37

**. Correlation is significant at the 0.01 level (2-tailed).

4.5 Discussion of Results

The study revealed that the hostel buildings and infrastructures sample are in a poor but manageable condition requiring maintenance/renovation. Also, it was revealed that the performance level of the hostel buildings and infrastructures sample are poor but manageable. This result supports the report of (Devi *et al*., 2015; Owolabi, 2015; Osuji, 2016). The condition and performance level of hostel accommodation have impact on the performance of the students. Osuji (2016) posit that the poor performance of students can be attributed to poor learning environment and lack of facilities among others. According to Devi *et al*. (2015), the hostel accommodation allows students to learn, worship, and establishes many far reaching good relationship among their peers; Students' accommodation influences their growth, behaviour and study performance. Owolabi (2015) reported that hostel accommodation enhances academic success, especially among the students of poor background as it blends this category of students with the brilliant ones, improve students social value through enhanced interactions, expose students to resource management, and prepared students for self-reliance and leadership resilience. Many buildings do not perform as planned, in some cases this comes with a great impact on the running cost, client satisfaction, performance, health and safety as well as comfort (Akinluyi, 2013).

It was also revealed that the components in a good condition and performance level are; connection between toilets, bathrooms and laundries, Size of toilets and bathrooms, Condition of the ceiling, and Fence height. The components in a poor state and would require immediate maintenance work are; ceiling height, Physical safety of students against falling and tripping, and General condition of toilets and bathrooms.

The study found that 81.08% of the components are in a stated that can best be described as dissatisfactory but still manageable. Thus, the level of satisfaction ranges between low to moderate. Efforts should be put in place to ensure that the building condition are restore to a comfortable and satisfactory level for the optimum performance of students in the various examination they are writing as highlighted by (Devi *et al*., 2015; Owolabi, 2015; Osuji, 2016).

The study found that there is a weak but positive relationship between the performance level of the hostel buildings and the satisfaction level of the occupants. This finding supports the findings of Khalil & Nawawi (2008) and Chohan *et al*. (2010). It was found that occupants' satisfaction highly correlates with the performance of public buildings, thereby indicating that user' satisfaction has a direct relationship with the overall performance of buildings in meeting the needs and expectations of the users. In Iraq and Iraqi Kurdistan region, studies have shown that users' satisfaction rarely correlate with the performance of university buildings and its facilities. The weak but positive correlation found in this study is a reflection of the level of understanding of the majority of the students.

4.6 summary of findings

1. The study revealed that 11 variables which represents 29.73% are in good condition and performance which indicates that the variables do not require immediate maintenance. Sixteen (16) variables which represent 43.24% are fair in condition and performance and ten (10) variables which represents 27.03% have poor condition and performance.

2. It also revealed that the building users are satisfied with the condition and performance of 6 variables, dissatisfied with 10 and fairly satisfied with 21 of the variables.
3. It was also revealed that the correlation between the level of building performance attributes and user's satisfaction level is low because (13.25%) implies a positive, but weak statistical relationship between the two set of variables. The study revealed that the hostel buildings sampled are in a poor but manageable condition requiring maintenance and renovation.
4. The research also revealed that 70.27% of the variables have performance issues and will require immediate attention or maintenance.
5. The study also found out that 83.78% of the components are in a state that can best be described as dissatisfactory the performance level of the hostel buildings sampled are poor but manageable.
6. It was also revealed that the among the building components in good condition and performance level are; connection between toilets, bathrooms and laundries, Size of toilets and bathrooms, Condition of the walls, condition of box rooms, size of hostel room, size of toilets, size of box rooms and Fence height.
7. The buildings components in a poor state and would require immediate attention and maintenance work are; ceiling height, Physical safety of students against falling and tripping, state of floor finishes, quality of air with air within toilets and bathrooms, general condition of laundries, and General condition of toilets and bathrooms.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion for the study

This research set out to evaluate the performance of some public secondary school hostel building (PSSHB) in Niger state. Using a survey approach, facility managers/house managers and students of Senior Classes where sampled, the study was able to examine the condition of the hostel buildings in some public secondary schools, to determine the performance level of some secondary school hostel building, to determine the levels of user's satisfaction in terms of functional performance, technical performance, and indoor environmental quality. Lastly, to determine the relationship between the level of building performance and the user's satisfaction level.

Based on the findings, the study therefore concludes that the hostel buildings sampled are in a poor but manageable condition requiring maintenance or renovation. Also, it was revealed that the performance level of the hostel buildings sampled` are poor but manageable. The condition and performance level of hostel accommodation have impact on the performance of the students. It was also revealed that the building components are in a good condition and performance level are; connection between toilets, bathrooms and laundries, Size of toilets and bathrooms, Condition of the walls, condition of box rooms, size of hostel room, size of toilets, size of box rooms and Fence height. The components in a poor state and would require immediate maintenance work are; ceiling height, Physical safety of students against falling and tripping, state of floor finishes, quality of air with air within toilets and bathrooms, general condition of laundries, and General condition of toilets and bathrooms.

The study concludes that 83.78% of the components are in a state that can best be described as dissatisfactory but still manageable. Thus, the level of satisfaction ranges between low to moderate. The study also concludes that there is a weak but positive relationship between the condition and performance level of the hostel buildings and the satisfaction level of the occupants. It was found that occupant's satisfaction highly relates with the performance of public buildings. This indicates that the user's satisfaction has a direct relationship with the overall performance of buildings in meeting the needs and expectations of the users. The weak but positive correlation found in this study is a reflection of the level of understanding of the majority of the students.

5.2 Recommendation for the study

Based on the findings of the study, the study therefore recommends that;

1. There is need to strengthen the relationship between the facility manager and architects to improve building performance evaluation.
2. It is recommended that effective building performance evaluation, cost cutting measures and maintenance management practices be put in place to improve the condition and comfort of users of the hostel buildings.
3. Government should make it a policy for building performance evaluation to be conducted periodically, this will increase productivity and academic performance of students.
4. The study recommends the need for provision of hostels with better design using quality materials that are durable and not overly expensive to maintain. These can be used as a benchmark for future projects.

5. Better construction designs that will reduce travel time to toilets, Toilets/bathrooms should be built and located logically, conveniently and discretely in the building to avoid bad smell and unnecessary health issues.

6. Private developers should be engaged in a partnership scheme with the government or the school management to construct more hostel building that will meet the needs of the growing population of the students.

7. The study also recommends effective BPE and maintenance management practices for the public secondary school hostel building facilities to improve its condition and comfort of the users.

8. Regular inspection and maintenance should be carried out in hostels and adequate funding should be provided for this purpose.

5.3 Contribution to Knowledge

From the findings, the following are the contribution of the research to knowledge;

1. The study has contributed in deepening the knowledge of performance evaluation of secondary school hostel buildings.

2. It shows that the decayed conditions of the secondary school hostel buildings are manageable through adequate maintenance and renovation.

3. The study also creates an understanding of the level of user's satisfaction of the hostel building in public secondary school hostel buildings.

4. The study gives an insight on the performance level of hostel buildings in public secondary schools in Niger State in terms of functional performance, technical

performance and indoor environmental performance, and other building support systems.

5. The study created and understanding of the critical challenges facing hostel buildings in terms of functional performance, technical performance, and indoor environmental performance.
6. The study also shows an idea/insight on how the condition of hostel buildings in our secondary schools can be improved.
7. The study also adds to the existing body of knowledge in performance evaluation of hostel buildings in Nigeria.

5.4 Area for further study

1. The study was limited to physical assessment of public secondary school hostels buildings in Niger state, further studies can be conducted in privately owned secondary school hostel buildings.
2. The study focused on performance of public secondary school hostel building and the user's satisfaction level, further research can be expanded to cover the performance of hostels and other building structures in relation to student's academic performance.
3. The study was limited to performance evaluation of public secondary school hostel buildings, further studies can be conducted in other areas such as other Educational building and health care buildings or commercial buildings.

REFERENCE

Abdullateef, A., Olanrewaju, M. F., & Khamidi, A. (2011). Validation of building maintenance performance model for Malaysian universities, *International Journal Humanities Social Sciences.* pp:159–163

Agyekum, K., Ayarkwa, J., & Amoah, P. (2016). Post Occupancy Ealuation of Postgraduate Students' Hostel Facilities and Services. *Journal of Building Performance Simulation*, pp: 97–104. Retrieved from https://www.researchgate.net/publication/306032422

Ahmad E. H., Hasnizan. A., & Sharul, Y. S. (2012). Functional assessment through post occupancy review on refurbished historical public buildings in Kualalumpur, *Proc. – J. Soc. Behavi. Sci.* 68 (2012) 330–340.

Ajayi, M., Nwosu, A., & Ajani, Y. (2015). Student's Satisfaction With Hostel Facilities in Federal University of Technology, Akure. *European Scientific Journal*, *11*(34), 402–415.

Akinluyi, L. (2013). Post Occupancy Evaluation of On- Campus Students Hall of Residence ' A Case Study of Obafemi Awolowo Hall of Residence Ile-Ife *' By Hall of Residence Ile-Ife*. *2012*, 0–10.

Akintoye, A. (2000). Analysis of factors influencing project cost estimating practice. construction management and economics. http:/dx.org/10.1080/014461900370979

Akman, E. (2002). Post Occupancy Evaluation with Building Values Approach. Bilkent: Bilkent University.

Alexander, K. (2008). The Applicability of Usability Concepts in the Built Environment. *Journal of Facilities Management.* 4 (4); 262-270.

Ali, B. (2018). *What is research design_*. Retrieved from https://www.researchgate.net/post/What_is_research_design

Aliyu, A. A., & Muhammad, M. S. (2016). A Review Of Post-Occupancy Evaluation As A Tool And Criteria For Assessing building performance. *Proceedings of the Academic Conference on Agenda for Sub-Sahara Africa*. Vol. 4 No. 1. 28th April, 2016 – University of Abuja, Teaching Hospital, Conference Hall, Gwagwalada, Abuja FCT-Nigeria.

Amaratunga, D., & Baldry, D. (1998). Appraising the total performance of higher education buildings: A participatory approach towards a knowledge- base system. In Construction and Building Research Conference 1998 : *Proceedings (COBRA)* 2nd-3rd September 1998, Oxford Brookes University (pp. 1–17).

Amaratunga, D., & Baldry, D. (2000). Assessment of Facilities Management Performance. Facilities, 18(7/8), 293–301.

Andale. (2016). *How To Find a Sample Size in Statistics*. Retrieved from https://ginsyblog.wordpress.com/2017/02/09/how-to-find-a-sample-size-in-statistics/

Anderson, A., Cheung, A., & Lei, M. (2014). Evaluation of Hong Kong's Indoor Air Quality Management Programme: Certification Scheme, Objectives, and Technology (*Bachelor of Science Project Report)*. Polytechnic Institute, Worcester, MA.

ASHRAE 55, (2004). Thermal Environmental Conditions for Human Occupancy. American Society of Heating, Refrigerating and AirConditioning Engineers, Atlanta, GA.

Barlex, M. J. (2006). Guide to Post Occupancy Evaluation Assessing Building Performance: Methods and Case Studies. , Oxford, UK.uation. University of Westminister Education Funding Council for England (HEFCE). london.

Bhattachergee, A., (2012). Social Science Research: Principles, methods, and Practices. Textbooks collection 3. http:/scholarcommons.usf.edu./oa_textbooks/3

Blyth, A., Gilby, A., & Barlex, M. (2006). Guide to Post Occupancy Evaluation. Higher Education Funding Council for England (HEFCE), Bristol (Available at) http://www.smg.ac.uk/documents/POEBrochureFinal06.pdf).

Bordass, B., Leaman, A., Davis, A. T., Salama, A. M., & Hardy, A. (2002). Building performance evaluation in the UK: So many false dawns. pp.1–13.

Bordass, B., & Leaman, A. (2005). Making feedback and postoccupancy evaluation routine 1: a portfolio of feedback techniques. *Build. Res. Inf.* 33 (4), 347–352.

Bordass, B., & Leaman, A. (2014). *Building Performance Evaluation in the UK. So many false downs*. Book:Architecture beyond criticisms

Belcher, R.G. (1997). Corporate Objectives, Facilities, Measurement and Use: A University Mode. *Conference Proceedings of COBRA 1997 held in Portsmouth*. Organized by the Royal Institute of Chartered Surveyors (RICS).

Cain, T. (2003). *Building Down Barriers*; A Guide to Construction Best Practices. London Spon press.

Carl-Erik, S., Bengt, S., & Jan, W. (2003). Model assisted survey sampling. Springer. pp. 9–12. ISBN 978-0-387-40620-6. Retrieved 2 January 2011.

Cash, C. (1993). Building Condition, Student and Behaviour. Dissertation Abstracts *International journal for humanities and social sciences*. 54; 03A.

Center for Innovation in Research and Teaching. (2014). Sampling Methods for Quantitative Research. Retrieved from https://cirt.gcu.edu/research/developmentresources/research_ready/quantresearch/sample_meth

Chandrasekar, K. (2011). Workplace Environment and its Impact on Organisational Performance in the Public Sector Organisations, *International , 1(1). Journal of Enterprise Computing and Business Systems, 1*(1), 1–17.

Chohan, A.H., Che-Ani, A.I., Memon, Z., Tahir, M.M., Abdullah, N.A. G., & Ishak, N.H.(2010). Development of user's sensitivity index for design faults in low rise urban housing, a study of development metropolitan city. *Am. J. Sci. Res.* 12 (2010), 113–

124.

Choi, J.H., Loftness, V., & Aziz, A. (2012). Post-occupancy evaluation of 20 office buildings as basis for future IEQ standards and guidelines. Energy Build. 46, 167–175.

Codinhoto, R., Tzortzopoulos, P., Kagioglou, M., Aouad, G., & Cooper, R. (2009). *HACIRIC The impacts of the built environment on health outcomes _ Facilities _ Vol 27, No 3_4*. *27*(3/4), 138–151. https://doi.org/, https://doi.org/10.1108/02632770910933152

Cohen, R., Standeven, M., Leaman, A., & Bordass, B. (2001). Assessing building performance in use 1 : the Probe process. *Building Research & Information*, 29(2), 85–102. doi:10.100080/09613210010008018

Council, F. F. (2011). Learning from Our Buildings: A State of the Practice Summary of Post Occupancy Evaluation, *Federal Facilities Council Technical Report* No. 145,.

Darkwa, I. (2006). Post Occupancy Evaluation of State-subsidized Housing Units in Kayamadi, Stellenbosc. University of Stellenbosch.

Davara, Y., Meir, I.A., & Schwartz, M. (2006). Architectural design and IEQ in an office complex, healthy buildings: creating a healthy environment for people. In: de Oliveira Fernandes, E. *et al*. (Eds.), *Proceedings of the International Conference on Healthy Building*, Lisbon, vol. III, pp. 77–81.

Derbyshire, A. (2001). Probe in the UK context (Editorial), *Building Research and Information*, Vol. 29 No. 2, special issue: Post-occupancy evaluation, pp. 79-84.

Devi, V., Ashari, S.N.B.M., Rashid, S.B.A., Adlan, M.A.B.N., & Musadiq, M.M.B.M. (2015). Cost benefit and risks associated with in-campus and off-campus accommodations of medical students: a cross-sectional study. *International Journal of Pharmacol. and Clin. Sci.*, 4(3), 58-62

Duffy, F. (2008). Building appraisal: a personal view. *Journal for Building Appraisal*, *4*(3), 149–156.

Eke, C., Clinton, A., & Wellington, T. (2013). An Exploratory Literature Review of Post Occupancy Evaluation. *Proceedings of the International Conference on Civil and Environmental Engineering (CEE'2013)*. Nov. 27-28, 2013 Johannesburg (South Africa), 170–173.

Eke, C., Aigbavboa, C., & Thwala, W. (2013). Post Occupancy Evaluation Assessment of Students ' Residence - A Report from South Africa.

Explorable. Com. (2009). *Non-Probability Sampling*. Retrieved from https://explorable.com/non-probability-sampling

Fatoye, E.O., Odusami, K.T., (2009). Occupants' satisfaction approach to housing performance evaluation: the case of Nigeria. In: *Proceedings of the RICSCOBRA Research Conference*, University of Cape Town 10-11 September, 2009. Available at: (http://dx. doi.org/http://www.rics.org/cobraS).

Federal Facilities Council, (2001), Learning from Our Buildings: A State of the Practice Summary of Post Occupancy Evaluation, *Federal Facilities Council Technical Report* No. 145, National Academy of Science.

Fieldson, R., & Sodagar, B. (2017). Understanding User Satisfaction Evaluation in Low Occupancy Sustainable Workplaces. https://doi.org/10.3390/su9101720

Finch, E. (1999). Empathetic design and post-occupancy evaluation. *Facilities,* Vol. 17 No. 11, pp. 431-5.

Fisk, D. (2001). Sustainable development and post-occupancy evaluation. *Build. Res. Inf*. 29 (6), 466–468.

Francescato, G. & Garling, T. (2002). Residential satisfaction research: The case for and against. In: *J.I. Residential Environments* – Choice, Satisfaction and Behaviour. Westport, CT: Bergin & Garvey, pp. 15–34.Google Scholar

Garcia, M.L. (2007). Design and Evaluation of Physical Protection Systems, 2nd ed. Butterworth Heinemann, Burlington, MA.

Gopikrishnan, S., & Topkar, V. M. (2017). Attributes and descriptors for building performance evaluation. *HBRC Journal*, *13*(3), 291–296. https://doi.org/10.1016/j.hbrcj.2015.08.004

Green, S. D., & Moss, G. (1998). Value management and post-occupancy evaluation. *Closing the Loop Facilities*, *16*(1–2), 34–39.

Gupta, R., & Chandiwala, S. (2010). Integrating an occupant-centered building performance evaluation approach to achieve wholehouse and low-carbon retrofitting of UK homes. In: *Proceedings of the Conference on Adapting to Change*: New Thinking on Comfort Cumberland Lodge, Windsor, UK 9-11 April 2010. London: Network for Comfort and Energy Use in Buildings. Available at: (⟨http://nceub.org.ukS⟩)

Hakkinen, T. & Nuutinen, M. (2007). Setting Sustainable Solutions for Office Buildings. *Facilities*, 25 (11/12): 437-451.

Hanif, M., Hafeez, S., & Riaz, A. (2010). Factors affecting customer satisfaction. *Int. Res. J. Financ. Econ.* 60, 44–52.

Hashim, A. E., Hasnizan, A., & Sharul. Y. S. (2012), Functional assessment through post occupancy review on refurbished historical public buildings in Kualalumpur, *Proc. – J. Soc. Behavi. Sci.* 68 (2012) 330–340.

Hassanain, M.A. (2008). On the performance evaluation of sustainable student housing facilities. *J. Facil. Manag.* 6 (3), 212–225

Hasselaar, E., 2003. Health performance indicators of housing. In: Proceedings of Healthy Buildings.

Hewitt, D., Higgins, C., & Heatherly, P. (2005). A market-friendly Post Occupanc Evaluation:*Building Performance Repor*t. New Buildings Institute, Inc, Washington.

Hewitt, D., Higgins, C., Heatherly, P., & Turner, C. (2009). A Market-friendly Post

Occupancy Evaluation: *Building Performance Report.* Report Prepared for Northwest Energy Efficiency Alliance.

Higgins, S. E., Wall, K., & Mccaughey, C. (2005). The Impact of School Environments : The Centre for Learning and Teaching School of Education, (May 2014).

Hinde, D. (2012). *hinde Sybex PRINCE2 Study Guide*.

Huizenga, C., Zagreus, L., Arens, E., & Lehrer, D. (2003). Measuring Indoor Environment Quality: A Web-based Occupant Satisfaction Survey. Berkeley. Wurster Hall.

Ibem, E.O., 2011. Evaluation of Public Housing in Ogun State, Nigeria (Doctoral dissertation). Covenant University, Ogun State, Nigeria.

Ibem, E., Alagbe, O., & Owoseni, A. (2017). A Study of Students Perception of The Learning Environment : Case Study of Department OF Architecture , Coventry University , Ota Ogun State. *Proceedings of INTED2017 Conference* 6th-8th March 2017, Valencia, Spain, (March), 6275–6286.

Ibem, O., Opoko, A., & Adeboye, A. (2013). Performance evaluation of residential buildings in public housing estates in Ogun State , Nigeria : Users ' satisfaction perspective. *Frontiers of Architectural Research*, *2*(2), 178–190. https://doi.org/10.1016/j.foar.2013.02.001

Ibrahim, A. D. (2011). Development of Procurement Strategy for Infrastructure in Nigeria: Case of Primary Healthcare Facilities. *Malaysian Construction Journal*, *8*(1), 71–86.

Shohet, I.M., Sarel-Lavy, L., & Dany B.N. (2003). Integrated maintenance management of hospital buildings in Israel, *J. Construct. Manage. Econom.* 21 (2003) 197–208

Ilesanmi, A. O. (2010). Post-occupancy evaluation and residents' satisfaction with public housing in Lagos, Nigeria _ SpringerLink. *Journal for Building Appraisal*, *6*(2), 153–169.

Illuminating Engineering Society of North America (IESNA), (2000). *IESNA Lighting* Handbook 9th ed. Illuminating Engineering Society of North America, New York.

Jiboye, D. A. (2012). Post-occupancy evaluation of residential satisfaction in Lagos , Nigeria : Feedback for residential improvement. *Frontiers of Architectural Research*, *1*(3), 236–243. https://doi.org/10.1016/j.foar.2012.08.001

Kaplan, R. & Norton, D. (1996). Using the Balanced Scorecard as a Strategic Management System. *Harvard Business Review*. JanuaryFebruary. Pp. 75-87.

Karim, H., & Carl, C. (2014). Post-occupancy evaluation : purpose , benefits and barriers. (January 2009), 20–33. https://doi.org/10.1108/02632770910923063

Kathsrine, I. A., & Svein, B. (2004). User Needs/Demands (Functionality) and Adaptability of Buildings: A Model and a Tool for Evaluation of Buildings. Oslo: Trondheim and multi consult AS. Norwegian University of science and technology

Khalil, N., & Nawawi, A. H. (2008). Performance Analysis of Government and Public Buildings via Post Occupancy Evaluation. *Asian Social Science*, *4*(9), 103–112.

Retrieved from www.ccsenet.org/journal.html

Khalil, N., Husin, H. N., & Zakaria, S. R. (2010). Performance Evaluation of Indoor Environment towards Sustainability for Higher Educational Buildings. In T*he 8th JTEFS/BBCC conference "Sustainable Development. Culture. Education"*, 17-19 May 2010, Paris, France.

Khalil, N., Nizam, S., & Rizal, M. (2015). Asia Pacific International Conference on Environment-Behaviour Studies Benchmarking Users ' Feedback as Risk Mitigation in Building Performance for Higher Education Buildings (HEB). *Procedia - Social and Behavioral Sciences*, *168*, 171–180. https://doi.org/10.1016/j.sbspro.2014.10.222

Khalil, N., Kamaruzzaman, S. N., Nawawi, A. H., Husin, H. N., & Hashim, A. E. (2015). The Conceptual Framework of Building Performance-Risk Indicators (PRI) For Buildings Users in Higher Education Institutions. 747, 363–366. https://doi.org/10.4028/www.scientific.net/AMM.747.363

Khan, S., & Kotharkar, R. (2012). Performance Evaluation of School Environs : Evolving an Appropriate Methodology Building. 50(July), 16–18. https://doi.org/10.1016/j.sbspro.2012.08.052

Kim, S., Yang, I., Yeo, M., & Kim, K. (2005). Development of a housing performance evaluation model for multi-family residential building in Korea. *Build. Environ*. 40 (2005), 1103–1116.

Klis van der, M., & Karsten, L. (2008). Commuting Partner's dual Residences and the Meaning of Home. *J. Environ. Psychol.*, 29, 235-245. DOI:10.1016/j.jenvp.2008. 11.002.

Konara, K. M. G. K., & Sandanayake, Y. G. (2010). Building Post Occupancy Evaluation Framework.

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 J. Sci., Eng. Technol. Res.* 3 (1), 001–011.

Leaman, A. (2004). Post-Occupancy Evaluation: Building Use Studies [Online]. Available from: www.usablebuildings.co.uk.

Lobatón, J.C.G. (2011). Peer Interaction: A Social Perspective towards the Development of Foreign Language Learning. PROFILE 13(1), 189-203. ISSN 1657-0790.

Mamalougka, A. (2013). The relationship between user satisfaction and sustainable building performance: the case study of Leiderdorp's Town Hall Construction Management & Engineering (CME), Master. Delft University of Technology Faculty of Civil Engineering and Geosciences (⟨http://repository.tudelft.nl/islandora/object/uuid:84162702-9e09-4e02-bc47-425a77ca38c9?collection=research⟩).

Mayaki, S.S. (2005). Facility performance evaluation. *Paper presented at the International Conference Organized by the Nigerian Institute of Building. Nasarawa*, April, 20-22.

pp 34–47.

Meng, X., Minouge, M., (2011). Performance measurement models in facilities management, *J. Facil.* 29 (2011) 472–484.

Meir, I.A., Garb, Y., Jiao, D., & Cicelsky, A. (2009). Post-occupancy evaluation: an inevitable step toward sustainability. *Adv. Build. Energy Res*. 3 (1), 189–220.

Mohit, M,A., & Mohammad. A. (2012). Assessment of residential satisfaction with public housing in Hulhumale, Maldives, *Proc. – J. Soc. Behav. Sci.* 50 (2012) 756–770.

Mohamed, A. H. (2017) Indian Ocean University, Business Administration, Department Member Somalia. https://iouniversity.academia.edu/MohamedAdamHassan

Mustafa, F. A. (2017). Performance assessment of buildings via post-occupancy evaluation : A case study of the building of the architecture and software engineering departments in Salahaddin. *Frontiers of Architectural Research*, *6*(3), 412–429. https://doi.org/10.1016/j.foar.2017.06.004

Mutlag, M.A. (2002). A Study of the Relationship between School Building Conditions and Academic Achievement of Twelfth Grade Students in Kuwaiti Public High Schools. Unpublished PhD thesis. America: The Virginia Polytechnic Institute and State University.

Najib, N., Ulyani, M., Yusof, N. A., & Abidin, N. Z. (2011). Student residential satisfaction in research universities. *Journal of Facilities Management,* 9(3), 200–212. doi:10.1108/14725961111148108

Neilson, C., Zimmerman, S. (2011). The Effect of School Construction on Test Scores , School Enrollment , and Home Prices. (6106).

Nik-Mat, N.E.M., Kamaruzzaman, S.N., Pitt, M., (2011). Assessing the maintenance aspect of facilities management through a performance measurement system: a Malaysian case study, *Proc. Eng. J.* 20 (2011) 329–338.

Nimako, S.G. & Bondinuba, F.K. (2013). Relative Importance of Student Accommodation Quality in Higher Education. *Current Research Journal of Social Sciences* 5(4): 134-142.

Novek, S., Menec, V., Tran, T., & Bell, S. (2013). Social Participation and its Benefits. Centre on Aging, University of Manitoba.

.Nik-Mat, N.E.M., Kamaruzzaman, S.N., & Pitt, M. (2011). Assessing the maintenance aspect of facilities management through a performance measurement system: a Malaysian case study, *Proc. Eng. J.* 20 (2011) 329–338.

Obiegbu, M. E. (2005). Overview of Total Performance Concept of Buildings: Focusing on Quality, Safety, and Durability. *Paper presented at the 34th Annual Conference of the Nigerian Institute of Building held in Abeokuta*. April 27-28. Pp 2-10.

Oorganisation for Economic Cooperation and Development. (2003). Review of Building Quality Using Post-Occupancy Evaluation. *The PEB Exchange Journal of the OECD*

Programme on Educational Building. 1 (48); 15-18. 277

Oorganisation for Economic Cooperation and Development. (2006). *PEB Organizing Framework for Evaluating Quality in Educational Facilities.* Second Adhoc Experts Group Meeting [Online]. Available from: www.oecd.org/edu/facilities/evaluatingquality.

Okolie, K.C. (2011). Performance Evaluation of Buildings in Educational Institutions: A case of Universities in South-East Nigeria: *A Doctorate Thesis in Construction Management in the Department of Construction Management,* Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.

Oladiran, O.J. (2013). A Post Occupancy Evaluation of Students' Hostels Accommodation, Journal of Building Performance ,4(1), pp: 33-43. http://spaj.ukm.my/jsb/index.php/jbp/index

Oladoja, I. B. (2015). Performance Evaluation of Primary Health Care (PHC) Buildings in the Federal Capital Territory (FCT). Ahmadu Bello University, Zaria.

Olatunji, A. (2013). Post-Occupancy Evaluation of Lagos State Polytechnic Facilities : A User-Based System Post-Occupancy Evaluation of Lagos State Polytechnic Facilities : A User-Based System. *Journal of Emerging Trends in Engineering and Applied Sciences (JETEAS)*, *4*(2), 229–236. Retrieved from jeteas.scholarlinkresearch.org

Oliver, R.L. (1981). Measurement and evaluation of satisfaction process in retail setting. *J. Retail.* 57 (3), 25–48.

Owolabi, B.O. (2015). The Effects of Students' Housing on Academic Performance at the University of Ibadan in Nigerian. *International Journal of Scientific & Engineering Research.* 6(3), 1118-1132.

Osanyinro, O., & Aghimien, D. O. (2017). *Nigerian Institute of Quantity SurveyorS : Theme : Confluence of Research ,* Theory and Practice in the Built Environment. (November).

Osuji, J. N. (2016). Impact of School Facilities on Student' Academic Performances in Public Secondary School in Giwa and Zaria Education Zones, Kaduna state. Ahmadu Bello University, Zaria.

O'Sullivan, D.T.J., Keane, M.M., Kelliher, D., & Hitchoock, R.J. (2004). Improving building operation by tracking performance metrics throughout the building lifecycle (BLC). *Energy Build*. 36 (11), 1075–1090.

Palm, P. (2007). Closing the Loop: *The Use of Post Occupancy Evaluation in Real Estate and Management,* Licentiate Thesis. Stockholm: Kungliga Tekniska Hogskolan.

Parker, C., & Mathews, B.P. (2001). Customer satisfaction: contrasting academic and consumers' interpretations. Mark. *Intell. Plan*. 19 (1), 38–46.

Peter O. O., Eze, E. C., & Anthony, A, A. (2019). Assessment of quantity surveying firms process and product innovation drive in nigeria. *seisence journal of management* 2(2), 22-38.http:/doi.org/10.33215/sjom.v212.111

Philip, A., Ileanwa, A. C., & El-hussain, A. M. (2018). Post-Occupancy Evaluation of Students Hostel Facilities in Federal Universities in North Central , Nigeria. *Architecture Research*, *8*(4), 123–128. https://doi.org/10.5923/j.arch.20180804.02

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

Preiser, W.F.E. (1995). Post-occupancy evaluation: how to make buildings work better, *Facilities*, Vol. 13 No. 11, pp. 19-28

Preiser, W. F. E., & Schramm, U. (1998). *Building performance evaluation* (Timesaver; D. Watson, M. J. Crosbie, & J. H. (Eds. . Callender, Eds.). McGraw Hill, New York.

Preiser, W.F.E. (1999). Built environment evaluation: conceptual basis, benefits and uses. In: Stein, J.M., Spreckelmeyer, K.F. (Eds.), Classic Readings in Architecture. WCB/McGraw-Hill, Boston.

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

ResearchLifeLine. (2012). *Five Steps in Creating a Survey Sampling Plan.* In *Survey Pocess White Paper Series* (pp. 1–6). Retrieved from www.researchlifeline.com

Reza, B. (2018). What is research design_. Retrieved from https://www.researchgate.net/post/What_is_research_design

Saidu, I., & Shakantu, W.M. (2016). The contributions of material waste to project cost overrun in Abuja. Nigeria. *Acta structilla*, 23(1), 99-113

Sanni-Anibire, M.O. & Hassanain, M.A. (2016). Quality assessment of student housing facilities through post-occupancy evaluation. *Archit. Eng. Des. Manag.* 12 (5), 367–380.

Sanni-Anibire, M.O., Hassanain, M.A., & Al-Hammad, M.A. (2016). Post-occupancy evaluation of housing facilities: an overview and summary of methods. *J. Perform. Constr. Facil.* 30 (5) (10.1061/)(ASCE) (CF.1943-5509.0000868)

Sanoff, H. (2001). School Building Assessment Methods. Washington: *National Clearinghouse for Educational Spaces.*

Sanoff, H. (2003). Three Decades of Design and Community. North Carolina State University, Raleigh, NC.

Sarel-Lavy, J. A., & Garcia, M.K. (2011). Establishment of KPIs for facility performance measurement: review of literature, *J. Facil.* (2011) 445–464.

Shohet, M.I., Sarel-Lavy, L.D. (2003). Integrated maintenance management of hospital buildings in Israel, *J. Construct. Manage. Econom.* 21 (2003) 197–208.

Sinopoli, J. (2009). How Do We Measure The Performance Of A Building ? Smart Buildings LLC. Retrieved May 10, 2013, from http://www.smart-buildings.com/uploads/1/1/4/3/11439474/howdowemeasure0809.pdf

Stavroula, S., Labros, S., Georgios, A., & Loannis, P. (2014). The Effect of the School Internal Environment of Secondary Education. *Mediterranean Journal of Social Sciences MCSER Publishing, Rome-Italy, 5*(13), 17. https://doi.org/10.5901/mjss.2014.v5n13p244

Stephen, J., & Zotorvie, T. (2017). Students's Accommodation and Academic Performance: The Case of Ho Technical University , Ghana. *European Scientific Journal*, *13*(13), 290–302. https://doi.org/10.19044/esj.2017.v13n13p290

Ueltschy, L.C., Laroche, M., Eggert, A., & Bindl, U. (2007). Service quality and satisfaction: an international comparison of professional services perceptions. J. Serv. Mark. 21 (6), 410–423.

Van der Voordt, T.J.M., & Maarleveld, M. (2006). Performance of office buildings from user's perspective. *Ambient. Construido* 6 (3), 7–20.

Vischer, J. C. (2008). Towards a user-centered theory of the built environment. *Build. Res. Inf.*, 36(3), 231–240.

Watson, C. (2003). Review of Building Quality Using Post-occupancy Evaluation. *Journal of Programme Educational Building*, 3(5), 1–5.

Watt, D. (2007). *Building Pathology* (2nd ed.). Blackwell, Oxford.

Weller, L.D. (1995). *School Restructuring and Downsizing*: Using TQM to Promote CostEffectiveness, The TQM Magazine, 7 (6); 11-16

Whitemyer, D. (2006). Anthropology in design, available at: www.designmatters.net/pdfs/0406/0406anthropology.pdf (accessed 3 July 2008).

Whyte, J., & Gann, D.(2003). Design quality indicators: work in progress. *Building Research and Information*, 31(5), 387–398.

Wilkinson, S.J., Reed, R.G., & Jailani, J. (2011). User satisfaction in sustainable office buildings: a preliminary study. In: *Proceedings of the 17th Pacific Rim Real Estate Society Annual Conference*, Pacific Rim Real Estate Society, Gold Coast, Qld.

Xianhai M., & Michael, M. (2011). Performance measurement models in facilities management, *J. Facil.* 29 (2011) 472–484.

Yamane, T. (1986). Statistics: An Introductory Analysis‖ Harper Row Publisher: New York.

Zagreus, L., Huizenga, C., Arens, E., & Lehrer, D. (2004). Listening to the occupants: a web-based indoor environmental quality survey. *Indoor Air 14* (Suppl. 8), 65–74.

Zambouni, J. (2018). What Is the Meaning of Sample Size? Retrieved from https://sciencing.com/meaning-sample-size-5988804.html

Zeisel, J. (1981), Inquiry by Design, Brooks-Cole, Monterey, CA.

Zimmerman, A. and Martin, M. (2001). Post-occupancy evaluation: benefits and barriers, *Building Research and Information*, Vol. 29 No. 2, pp. 168-74.

Zimring, C. (1988). Post-occupancy evaluation and implicit theories of organizational decision-making. In: *Proceedings of the 19th Annual Conference of the Environmental Design Research Association*, California. pp. 277–280.

Zimring, C. R., & Kampschroer, K. (2005). Space Performance Evaluation (SPE)) National Institute of Building Sciences (NIBS). Washington, D.C. How to Make Buildings Work Better. *Facilities.* 13 (11); 19-28. [Online]. Available www.wbdg.org/design/fpe.php

"APPENDIX A"

QUESTIONNAIRE

Department of Quantity Surveying,
School Environmental Technology,
Federal University of Technology,
P.M.B. 65, Minna, Niger State.

Dear Participant,

MTech Research Thesis: Mr. Liman, Alhaji Ibrahim

I wish to confirm that the bearer of this letter Mr. Liman Ibrahim Alhaji is an MTech. student in the Department of Quantity Surveying within the School of Environmental Technology, Federal University of Technology Minna, Niger State, Nigeria. The thesis project is titled **"Performance Evaluation of Public Secondary School Hostel buildings in Niger State"**

Please note that all information provided will be used for academic purposes. therefore, do not include your name or telephone number in your response. Your participation in filling of the questionnaire will be very helpful.

If you have questions or observations at any time about the survey or procedures, please contact me on:

07038813706, or my e-mail: limanibrahimalhaji@gmail.com

Thank you very much for your support.

LIMAN, Alhaji Ibrahim
Department of Quantity Surveying,
Federal University of Technology Minna,
P.M B. 65,
Minna, (Gidan Kwanu Campus).

Dr. K. A. Mohammed
Project Supervisor

PERFORMANCE EVALUATION OF PUBLIC SECONDARY SCHOOL HOSTEL BUILDINGS IN NIGER STATE.

Section A: Demographic Information of Respondents

Please Kindly tick [ ] your response where appropriate

1. What is your gender? A) male [ ] b) female [ ]
2. Age A) 15 – 24 [ ] B) 25 – 34 [ ] C) 35 – 44 [ ]
   D) 45 and above [ ]
3. Which of these are you? A) facility managers/ house master [ ] B) student [ ]
4. Class of student respondent? A) SS I [ ] B) SS II [ ] C) SS III [ ]

SECTION B: CORE RESEARCH OBJECTIVES QUESTIONS

Objective No 1: To determine the condition and the performance level of selected public secondary school hostel buildings.

Instructions: choose from the appropriate answer from the five options given below.

NB: 1. Very Good 2. Good 3. Neutral 4. Poor 5. Very Poor

S/N	Performance Attributes	1	2	3	4	5
	Functional Performance					
1	What is the condition of the walls of the hostel you live?					
2	Condition of the roof covering (zinc cover in the roof)					
3	State of finishes (plaster, paint) on the room walls					
4	Shape of the floor finishes (floor screed or tiles)					
5	Condition of the ceiling					
6	Level of access (connection between the rooms)					

7	Safety and security from insects and fire accidents					
8	Electrical safety from loosed fittings or wires					
9	Physical safety of students against falling and tripping					
10	Condition of rain water drainage					
11	Protection against insects					
12	General condition of box rooms					
13	Shape of doors and windows (fittings, frames, glazing)					
14	General condition of toilets and bathrooms					
15	General condition of the laundries					

S/N	**Performance Attributes**					
	Technical Performance					
1	Size of your hostel rooms					
2	Size of box rooms					
3	Size of toilets and bathrooms					
4	Size of laundry					
5	Doors and windows positioning to aid escape in case of emergencies situations					
6	Spaces within the rooms and lobby to ease movement					
7	Space outside rooms e.g. corridors and frontage					
8	Aesthetics (beauty with and outside the rooms)					

9	General building maintenance of the hostel					
10	Location of the hostel building					
11	Location of toilets, bathrooms and laundries					
12	Connection between toilets, bathrooms and laundries					
13	Ceiling height					
14	Fence height					

S/N	**Performance Attributes**	**1**	**2**	**3**	**4**	**5**
	Indoor Environmental Performance					
1	Natural lighting level					
2	Artificial lightening (bulbs)					
3	Quality of air within the rooms from doors and windows					
4	Quality of air within toilets and bathrooms					
5	Quality of air within the laundry					
6	Noise from the other rooms					
7	Noise from outside the building					
8	Cooling condition within the rooms and corridors					

SECTION C

This section of the questionnaire is designed to determine the satisfaction level of the building occupants using the building attributes

Instruction: In this part, please kindly respond as required to choose the appropriate.

NB: 1. Strongly Satisfied 2. Satisfied 3. Undecided 4. Dissatisfied 5. Strongly Dissatisfied

S/N	Performance Attributes	1	2	3	4	5
	Functional Performance					
1	Condition of walls in your hostels rooms					
2	state of the roof					
3	State of finishes (plaster, paint) on the room walls					
4	Shape of the floor finishes (floor screed or tiles)					
5	Condition of the ceiling					
6	Level of access (connection between the rooms)					
7	Safety and security from insects and fire accidents					
8	Electrical safety from loosed fittings or wires					
9	Physical safety of students against falling and tripping					
10	Condition of rain water drainage					
11	Protection against mosquitoes					
12	General condition of box rooms					
13	Shape of doors and windows (fittings, frames, glazing)					
14	General condition of toilets and bathrooms					

15	General condition of the laundries					

S/N	Performance Attributes	1	2	3	4	5
	Technical Performance					
1	Size of your hostel rooms					
2	Size of box rooms					
3	Size of toilets and bathrooms					
4	Size of laundry					
5	Doors and windows positioning to aid escape in case of emergencies situations					
6	Spaces within the rooms and lobby to ease movement					
7	Space outside rooms e.g. corridors and frontage					
8	Aesthetics (beauty with and outside the rooms)					
9	General building maintenance of the hostel					
10	Location of the hostel building					
11	Location of toilets, bathrooms and laundries					
12	Connection between toilets, bathrooms and laundries					
13	Ceiling height					
14	Fence height					

S/N	Performance Attributes	1	2	3	4	5
	Indoor environmental performance					
1	Natural lighting level					
2	Artificial lightening (bulbs)					
3	Quality of air within the rooms from doors and windows					
4	Quality of air within toilets and bathrooms					
5	Quality of air within the laundry					
6	Noise from the other rooms					
7	Noise from outside the building					
8	Cooling condition within the rooms and corridors					