

# Users' Satisfaction with the Condition of Hard Services in an Office Building in Abuja, Nigeria

**Buhari Mohammed Manzuma, Baba Augustine Ameh & Mohammed Mustapha Saad**

Department of Building, Ahmadu Bello University, Zaria, Nigeria

\*Corresponding Author: [bmmanzuma@abu.edu.ng](mailto:bmmanzuma@abu.edu.ng)

## Abstract

The comfort and hence the productivity of users of any building has been found by various studies to be influenced by the quality of the indoor environment of such buildings. This study assessed the user's satisfaction with the condition of hard services in an office building in Abuja through the use of self-administered questionnaires. Descriptive statistical analysis was performed on the collected data. The results show that from the users' point of view the cooling system (4.13), furniture (3.89), the access control system (3.58) and the fire alarm system (3.57) respectively have very good performance while the sanitary system (3.45), office equipment (3.44), the lift system (3.25), the generator (2.98) and the lighting system (2.77) are rated to be of good performance and the performance of the extractor fans (2.40) are rated to be average. The responses also indicate that the level of satisfaction derived from a system is directly proportional to its performance. The influence of each of the air conditioners, furniture, the generator, the floor finishes and the sanitary fittings on the productivity of the respondents is high while the wall finishes, ventilation system, lift system and the lighting systems only averagely influence the productivity of the respondents. The conclusion from the study is that there is a direct relation between the condition of the hard services in a building, the level of satisfaction of the users and consequently their output. It is recommended that performance evaluations be conducted on buildings accommodating large number of workers at predetermined intervals to determine the ways in which the condition of the installations in the building affect their performance.

**Keywords:** hard services, user satisfaction, performance, facilities, productivity.

## Introduction

The satisfaction of the users of a building is a very important factor for consideration if efficiency and effectiveness in the execution of the assigned tasks (work being performed in the building) are issues of interest to the employer (owner of the building). The satisfaction of building occupants can be influenced by their conditions of service which includes remuneration and the state of the physical environment in which they operate. The physical environment of buildings is typically composed of the hard services as the major constituents. The level of satisfaction of the users is in part an indication of the performance of the hard services. The performance of buildings is

evaluated from time to time through the process of building performance evaluation.

Building performance evaluation can be viewed as a tool for diagnosis of the performance of buildings which allows managers of such buildings to not only identify issues affecting performance but to also evaluate the performance of critical aspects of a facility in order to develop or design guidance and criteria for further improvement (Li, Froese & Brager, 2018). Nigeria is among the many developing nations that does not carry out evaluation of the performance of public buildings due to insensitivity toward the feelings of end users and lack of attention to checkmate the

productivity of employees in relation with their workplace (Nwoye, 2011). The physical space in which a company or an organisation carries out its activities has been identified as one of the major factors that affects the efficiency and effectiveness of its operations. This is corroborated by Kamarulzaman, Saleh, Hashim, Hashim, and Abdul-Ghani (2011) in their assertion that different studies over the years have shown that the conduct of employees in their places of work are significantly affected by the features of the office environment. There is therefore the need for organisations willing to improve the performance of their workers to study and understand how their workplace impact the employees' performance. This calls for performance evaluation of facilities at predetermined time intervals to identify facilities requiring improvement (Leaman, Stevenson & Bordass, 2010; Ahadzie & Badu, 2011).

Most organisations in many parts of the world presently implement a linear building procedure that involves planning, briefing, design, construction and occupancy (Mohammed & Hassanain, 2010). For all new projects initiated by an organisation, these activities are repeated verbatim. Despite being a widespread practice, there are better ways than the traditional linear method of procuring buildings. Further arguments suggest that organisations should instead, adopt a new building method which involves planning, briefing, design, construction, occupancy and evaluation (Rosenheck, 2017). Evaluation is aimed at helping facility managers get feedback from the occupants whether or not constructed facilities are performing up to expectation (Becker, 2010). The information generated from such periodic evaluations are then fed forward into the design of new buildings or fed back towards the improvement of existing ones.

Abuja as the capital city of Nigeria is a fast developing one with a lot of planning and infrastructural challenges. To ensure the sustainability of the city, there is the need to ensure that the various facilities such as

buildings, roads, bridges and rail systems are maintained at such conditions that will ensure the continued performance of their functions at optimum levels. Jimoh, Oyewobi, Suleiman and Samuel (2019) observed that incorporation of post occupancy evaluation into building operations in Nigeria will contribute to the creation of a sustainable built environment in the country. This is particularly important in the case of Abuja since other than government offices, many national and international companies also have their offices there (Reza & Suleiman, 2021). Erebor, Ibem, Ezema and Sholanke (2021) observed that successful sustainable improvement of existing public office buildings in Abuja will involve giving more attention to users' needs as against the vagaries of design variables. Adama (2020) described Abuja as a relocated post-colonial capital city which replaced Lagos as Nigeria's capital city in 1991. Adama (2020) also observed that one of the unique features of Abuja is its building from scratch with the aid of a master plan which successive governments over the years have been struggling to avoid distorting. Buildings used as offices by government and non-governmental agencies are among the most important constituents of Abuja city. The objectives of this study are therefore to assess the users' perception of performance of facilities, their level of satisfaction with the facilities and the effect the performance of the facilities have on their productivity.

## **Literature Review**

### ***Building Hard and Soft Services***

Hard services refer to all physical services that have to do with the building fabric, the building content and building services such as mechanical, electrical, plumbing, lift/escalator and air conditioning systems (Barret & Baldry, 2009; Campbell, 2017; Islam, Nazifa & Mohamed, 2019; Moktar & Myeda, 2022). Tools and equipment, furniture, parking facility, well ventilated spaces with good lighting, fans and air-conditioners and neat and clean office place, rest area and washrooms are identified by

Sageer, Rafat and Agarwal (2012) as some examples of hard services in buildings.

Kanell (2020) defined soft services as all services that are directly used by the employees and makes the work place more secured or pleasant. Soft services are not an integral part of the building but they directly benefit employees who interact with them. They are not essential but their provision is intended to make the workplace more comfortable, enjoyable and secure for the employees. Examples are catering services, decoration and landscaping, office move services, reception services, cleaning services, project management, and division of labour.

The hard services in any organisation typically constitute the physical work environment and hence are expected to greatly affect the satisfaction and consequently the performance of any worker as they dictate whether or not an environment can be described as a healthy and happy workplace. The importance of hard services has been emphasised by Arampatzi and Burger (2020) in their observation that hard facilities management affects user wellbeing more strongly than soft facilities management. A key conclusion from the study of Arampatzi and Burger (2020) is that facilities management positively influence employee wellbeing. In the same vein, the study of Piriyanthanalai and Muenjohn (2012) identified that working environment is the second most influential of six factors on employee satisfaction and service quality. They found out that the supervisor's style of supervision is the most influential factor on employee satisfaction and service quality while the others are job responsibility, recognition factor, job advancement and salary respectively.

### ***Building Evaluation System***

The performance of a completed building should be to the satisfaction of the users (Mustafa, 2017; Hou, Lai & Edwards, 2020). This requirement arises from the fact that the employees are the prime resource of any organisation (Beloor,

Nanjundeswaraswamy & Swamy, 2017). Facilities in buildings must be fit for the purpose of the user which will in turn enhance the productivity of the users in meeting the objectives of the organisation (Vischer, 2018; Jenkin, McIntosh, & Every-Palmer, 2021). This is achieved through the process of building evaluation.

Leitner, Sotsek and Santos (2020) observed that many activities (such as data survey and profile search, walkthroughs, on-site physical measurements of relevant parameters, questionnaires, interviews and focused group meetings) can form part of the conduct of building evaluation but all the methods can be grouped into two broad classes namely user-based system and expert-based system of building evaluation. The former category uses the perception of building occupants to evaluate the extent of performance as well as fitness of a building for their use and therefore also referred to as post occupancy evaluation (POE). The latter method uses experts' assessment and is more encompassing to include subjects such as provision for information technology; organisation growth; variations in work style and resources efficiency. This is referred to as building performance evaluation (BPE). The POE can be viewed as a subjective evaluation system while BPE is more objective in approach. This study adopts the POE approach since the objective is to identify ways of improving the performance of the building being evaluated (Olivia & Christopher, 2015). This is in agreement with Erebor *et al* (2021) which emphasise more attention on the needs of the users of existing public offices for successful sustainable improvement of such spaces.

According to Meir, Garb, Jiao and Cicelsky (2009) post-occupancy evaluation (POE) is a tool that enables building owners to conduct a systematic study of buildings once occupied to acquire valuable data that can be used to improve the current conditions and also guide the design and construction of similar buildings in the future. In other words, POE is the systematic and thorough appraisal of built

facilities after their completion and occupation for some time (Preiser, White, & Rabinowitz, 2015; Li, Froese & Brager, 2018). POE is also viewed as the systematic investigation of the fitness for use and effectiveness of constructed and occupied facilities for human users (Li *et al*, 2018; Hay, Samuel, Watson & Bradbury, 2018). POE focuses on the users' needs and thus assist in providing useful insights into how past design decisions has affected the performance of buildings. This revelation provides vital information on how to design and build better in the future (Preiser, White & Rabinowitz, 2015).

It has been observed that both building owners and users erroneously believe that basic functionality will be provided during the normal course of events when procuring spaces, and thus do not deem it necessary to be specific about the requirements (Zimmerman and Martin, 2010; Government of India, 2019). Zimmerman and Martin (2010) and Ibem, Adeboye, Opoko and Amole (2013) also emphasised that POEs will not only reveal whether or not users got what they want but the findings can also be used to rectify problems and improve future designs.

Meir *et al* (2009) states that both quantitative and qualitative methods and tools are deployed in conducting POE and all the methods may be grouped into three categories based on the information analysed and assessed as follows: measurements, monitoring, sampling surveys, questionnaires, cohort studies, observations, task performance tests document analysis, on-site observations

Li *et al* (2018) classified the POE methods into two broad categories as given below: subjective methods such as occupant surveys, interviews and walkthrough assessments physical measurements of indoor environmental quality (IEQ) parameters, energy and water consumption.

## **Employee Satisfaction and Productivity**

The physical work environment if properly organized should help to motivate workers physiologically towards putting in their best into the assigned tasks and consequently achieving organizational functions and objectives. Martin (2013) argues that the true image of an organization is presented through their premises. The physical environment of an organization is a symbolic indicator of what the organization stand for. All workplaces comprise of facilities that must be managed to enhance not only efficiency and effectiveness but also the overall image and aim of the organisation. Ali, Chua and Lim (2015) stated that a healthy workplace is one in which all the facilities within the organization perform at their optimum level all the time. Functional facilities, provision of adequate work space, technology and physical environment that supports business goal and corporate culture and value enhance productivity and this is why the study of ergonomics is considered a very important one in facilities management. Martins (2013) stated that high quality buildings and utilities help boost employees' productivity by between 10 – 20%. One worrisome trend observed by Jimoh *et al* (2019) is that buildings hardly meet up with their expected performance at all times and it therefore becomes imperative to identify the factors responsible for the shortfall in performance and initiate remedial measures.

Employees' satisfaction with their work stimulates a series of positive actions which culminate in an improved performance of the company. It has been observed that the productivity, absenteeism and retention of employees are greatly influenced by their satisfaction with their job (Irabor & Okolie, 2019; Kapur, 2018; Davidescu, Apostu, Paul & Casuneanu, 2020). Highly motivated employees have a feeling of safety, comfort and they feel obliged to put in their best in the discharge of their responsibilities. On the contrary, poor working environment kills workers morale (Edwards, 2021). According to Irabor and Okolie (2019) the

success and survival of any business entity is hinged on the satisfaction and retention of its employees who are its lifelines. The subject of employee satisfaction is very vital in facilities management because of its direct positive influence on productivity and hence the profitability of a business.

**Research Methodology**

This study involved an empirical survey using a structured questionnaire. Copies of the questionnaire were distributed to staff members of the agency (not disclosed for anonymity) occupying the surveyed building for collection of information regarding the state and performance of the services in the building, their satisfaction level and the perceived effect of the performance of the facilities on their productivity.

The population of the study is the 102 staff members of the agency. The agency has different departments which are also not disclosed so as to maintain anonymity. The study adopted the whole population as the sample size but not all were available during the survey. 95 questionnaires were distributed to the staff members that could be reached during the survey. 84 of these were returned and were all found to be correctly completed and hence used for the analyses.

The questionnaire was structured in such a way that the first set of questions were aimed at obtaining information about the employee and the next set were for seeking the respondents' view on the performance of the hard services. These were followed by questions aimed at extracting information on the level of satisfaction of the staff while the last set of questions were for data collection on the effect of the performance of the hard services on staff productivity. The questionnaires were self-administered on the respondents.

**Analysis of Data**

The data collected was analysed using basic descriptive statistical tools: the mean and standard deviation.

Computation of the mean was done using the weighted average formula (equation i) as obtained from Stroud and Booth (2007).

$$\bar{x} = \frac{\sum fx}{\sum f} \dots\dots\dots \text{Equation (i)}$$

Where:  $\bar{x}$  = mean  
 x= points on the Likert's scale (1, 2, 3, 4, and 5)  
 f = frequency of respondents.

b. The standard deviations were calculated for each item of interest with the formula in equation ii;

$$SD = \sqrt{\frac{\sum (x - \mu)^2}{N}} \dots\dots\dots \text{Equation (ii)}$$

Where; x = Value of data set.  
 $\mu$  = Mean  
 N = Number of data point in the population

c. Meaning of rankings used in describing the performance of facilities.

- 5 Excellent: Works perfectly well without any issues
- 4 Very Good: Works with minor hitches that does not adversely affect function
- 3 Good: Works with a few issues that mildly affects performance
- 2 Fair: Works poorly with a number of issues
- 1 Poor: Not functional

**Presentation of Results**

The responses from the 84 questionnaires returned were analysed and the results are as presented in the following sections.

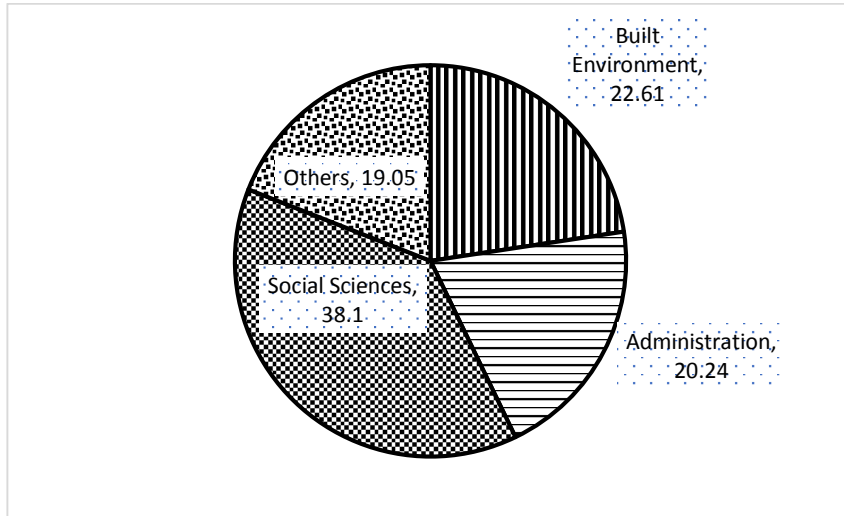
**Respondents' Data**

This section gives the basic information about the respondents. Forty-three and forty-one of the respondents are respectively males and females indicating some level of gender balance. A breakdown of the professions of the respondents reveals that 22.61%, 20.24%, 38.10% and 19.05% belong to the built environment, finance and administration, social sciences and other professions (such as medical sciences and arts) respectively. This is presented in Figure 1.

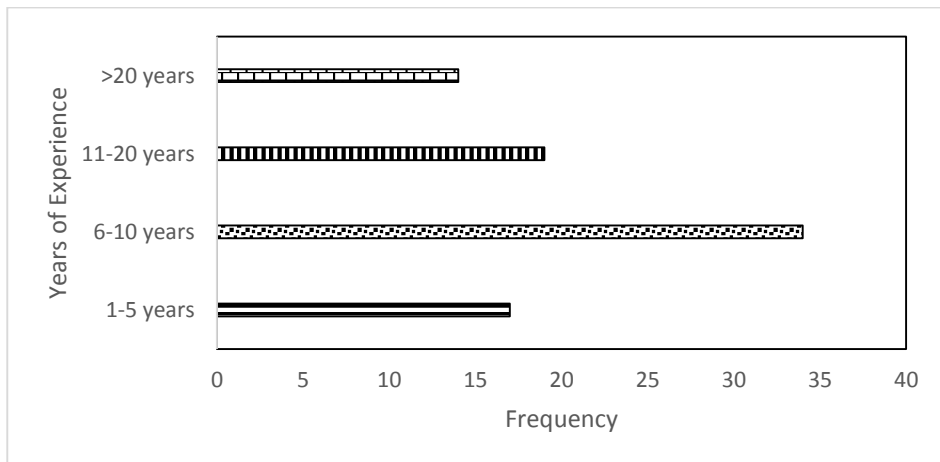
Figure 2 shows that 80% of the respondents have spent at least six years in the

organisation and hence deemed to be knowledgeable enough about the workings of the office to be able to respond to the issues raised in the questionnaire appropriately. The remaining seventeen

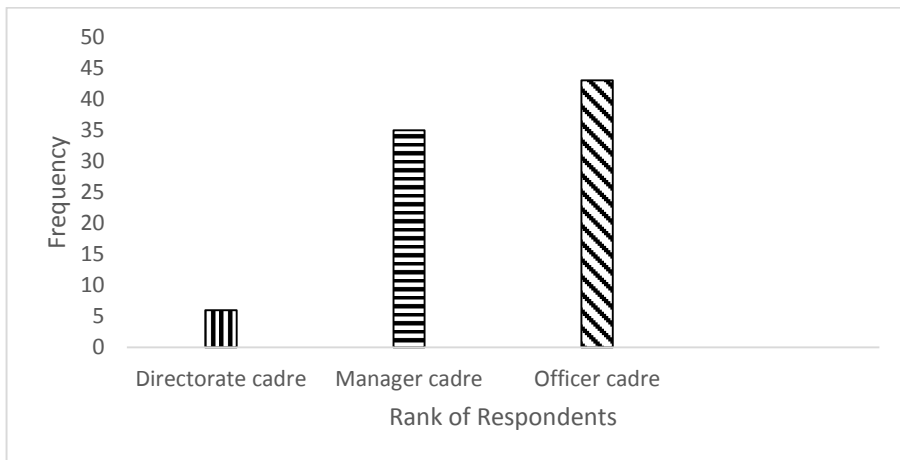
respondents (20%) has each spent between one to five years in the organisation. Over 90% of the respondents are on manager and officer cadres as can be seen in Figure 3.



**Figure 1:** Areas of specialization of the Respondents



**Figure 2:** Years of working experience of the Respondents



**Figure 3:** Rank of the Respondents

### ***Performance Rating***

Table 1 shows how respondents rated the performance of facilities in the building using a 5 – point scale from poor to excellent. The respondents were most pleased with the performance of air conditioners with a mean rating of 4.13 which is interpreted to be very good performance on the scale. Other systems whose performances are rated very good by the respondents are furniture, doors and locks, the fire alarm system and water closets respectively in that order. The respondents rated the performance of the other systems as good (with rating between 2.5 and 3.4) except the extractor fans whose performance the respondents described as fair (2.4).

### ***Level of satisfaction***

Table 2 presents the level of satisfaction of the users with the different systems and equipment installed in the surveyed building.

Table 2 shows that users are most satisfied with air conditioning systems (with a mean of 4.23), furniture (3.96), the water supply system (3.88), doors and locks (3.82), the floor finishes (3.76), fire extinguishers (3.75), the wall finishes (3.73), the standby generator (3.71) and the toilets (3.58) respectively. The respondents indicated that they derive a high level of satisfaction from each of the aforementioned systems. The respondents derive an average level of

satisfaction with the performance of each of the remaining facilities listed in Table 2 with the exception of the ventilation system in which case the level of satisfaction with performance is low (mean of 2.01). Improving natural lighting and ventilation will make the building more environmentally sustainable as well as enhancing users' comfort and health (Zanni, Soetanto & Ruikar, 2016; Manzuma & Ufwai, 2020; Manzuma & Awesiri, 2020). It can be observed that the level of satisfaction with the performance of office equipment is average (3.44) even though the performance was rated to be good. This is an indication of the need to identify the issues with office equipment so that their performance can be improved.

### ***Perceived Effect of Performance of Facilities on Productivity***

Table 3 shows the extent to which users think the performance of the hard services influences their productivity. It can be seen that the performance of air conditioners is perceived to highly affect staff productivity (3.70). Other services whose performances are rated to have high effect on productivity of the respondents are furniture (3.61), generator (3.57), floor finishes (3.55) and sanitary fittings (3.50). The performance of wall finishes, ventilation systems, lift and lighting systems are rated to have average effect on staff productivity.

**Table 1: Perception of Performance of the Facilities in the Building**

Equipment	Performance Rating					$\Sigma f$	$\Sigma fx$	Mean	Std. Dev.	Rank
	5	4	3	2	1					
Air conditioners	37	30	10	5	2	84	347	4.13	1.003	1 <sup>st</sup>
Furniture	30	27	19	7	1	84	330	3.89	1.010	2 <sup>nd</sup>
Access control	17	29	27	8	3	84	301	3.58	1.182	3 <sup>rd</sup>
Fire alarm system	15	30	29	8	2	84	300	3.57	0.973	4 <sup>th</sup>
Sanitary fittings	15	31	23	7	8	84	290	3.45	1.166	5 <sup>th</sup>
Office machines	12	33	23	12	4	84	289	3.44	1.057	6 <sup>th</sup>
Lift system	12	20	34	13	5	84	273	3.25	1.074	7 <sup>th</sup>
Generator	17	15	19	15	17	84	249	2.98	1.431	9 <sup>th</sup>
Lighting system	10	16	21	19	18	84	233	2.77	1.311	10 <sup>th</sup>
Extractor fans	3	16	21	19	25	84	202	2.40	1.206	11 <sup>th</sup>

1 – Poor    2 – Fair    3 – Good    4 – Very Good    5 – Excellent

**Table 2: Level of Satisfaction of Respondents with Facilities in the Building**

Equipment	Level of satisfaction					$\Sigma f$	Mean	Std. Dev.	Rank
	5	4	3	2	1				
Air Conditioner	40	31	7	4	2	84	4.23	0.961	1 <sup>st</sup>
Furniture	27	32	20	5	0	84	3.96	0.898	2 <sup>nd</sup>
Water Supply	17	44	19	4	0	84	3.88	0.823	3 <sup>rd</sup>
Doors and Locks	22	33	22	5	3	84	3.82	1.022	4 <sup>th</sup>
Floor Finishes	15	43	18	7	1	84	3.76	0.887	5 <sup>th</sup>
Fire Extinguishers	14	41	23	6	0	84	3.75	0.820	6 <sup>th</sup>
Wall Finishes	12	46	19	5	2	84	3.73	0.869	7 <sup>th</sup>
Generator	22	32	17	10	3	84	3.71	1.093	8 <sup>th</sup>
Water Closet	17	35	19	6	7	84	3.58	1.143	9 <sup>th</sup>
Office Equipment	10	35	22	16	1	84	3.44	0.974	10 <sup>th</sup>
Fire Alarm	8	33	25	15	3	84	3.33	0.998	11 <sup>th</sup>
Extractor Fan	5	25	24	20	10	84	2.94	1.123	12 <sup>th</sup>
Lift	10	15	13	31	15	84	2.69	1.289	13 <sup>th</sup>
Artificial lighting	7	12	20	35	10	84	2.65	1.125	14 <sup>th</sup>
Natural Lighting	3	5	10	41	25	84	2.53	0.993	15 <sup>th</sup>
Ventilation	5	8	2	37	32	84	2.01	1.156	16 <sup>th</sup>

5 – Very High    4 – High    3 – Average    2 – Low    1 – Very low



**Table 3: Effect of Performance of Facilities on Employees' Productivity**

Facilities	Frequency of Responses					Σf	Mean	Std. Dev.	Rank
	5	4	3	2	1				
Air Conditioner	29	27	11	8	9	84	3.70	1.326	1 <sup>st</sup>
Furniture	16	39	15	9	4	84	3.61	1.070	3 <sup>rd</sup>
Generator	20	28	21	10	5	84	3.57	1.154	4 <sup>th</sup>
Floor Finishes	17	31	21	11	4	84	3.55	1.102	5 <sup>th</sup>
Sanitary Fittings	7	42	23	10	2	84	3.50	0.898	6 <sup>th</sup>
Wall Finishes	9	36	23	10	6	84	3.38	1.063	9 <sup>th</sup>
Ventilation	6	28	24	22	4	84	3.12	1.031	10 <sup>th</sup>
Lift	6	17	32	22	7	84	2.94	1.044	12 <sup>th</sup>
Lighting	12	15	28	20	9	84	2.90	1.197	13 <sup>th</sup>

1 – Very low

2 – Low

3 – Average

4 – High

5 – Very high

### Conclusion and Recommendations

The research has established that end - users are highly satisfied with the performance of air conditioners, furniture, water supply, doors and locks, floor finishes, fire extinguishing system, wall finishes and the standby power generating system. The respondents also indicated that these hard services that offer them high satisfaction also have high levels of impact on their output. Services such as office equipment, fire safety system, extractor fans, lift and lighting systems with which the respondents are only averagely satisfied are also seen not as impactful on their productivity as those that offer them high level of satisfaction. This could be understood in the case of ventilation and extractor fans as the perceived efficiency of the air-conditioning system is likely to overshadow their inadequacies.

Since artificial and natural lighting are both used in the building, defects in one of the systems are not likely to adversely affect the productivity of the users of the buildings. The average level of satisfaction with services such as fire alarm, extractor fans and lift systems does not translate to low productivity probably because these facilities are not directly used in the execution of office works. However, the major conclusion of the study is that all the assessed subsystems of the building can be improved since none of them was rated to be excellent in performance by the users. This will translate to increased satisfaction and consequently improved productivity. In

view of the foregoing, it is recommended that efforts to improve the users' satisfaction with the office equipment be prioritized because of their use directly in the execution of office work so as to improve productivity. The same gesture should then extend to the other subsystems.

### References

- Adama, O. (2020). Abuja is not for the poor: Street vending and the politics of public space. *Geoforum*, 109, 14-23
- Ahadzie, D. K. and Badu, E. (2011). Success Indicators for self-build houses in two Ghanaian cities. *Journal of science and technology*, 31(3), 86-96
- Ali, A. S., Chua, S. J. L. and Lim, M. E. (2015). The effect of physical environment comfort on employees' performance in office buildings. *Structural Survey*, 33(4/5), pp. 294-308
- Arampatzi, E. and Burger, M. (2020). Facility management services and employee well-being. *Journal of Facilities Management*, 18(2), 109-130, DOI 10.1108/JFM-10-2019-0055
- Barret, P. and Baldry, D. (2009). *Facility Management: Toward Best Practice* 2<sup>nd</sup> Ed, New York: John Wiley & Sons.
- Becker, F. (2010) *Workplace Strategies and Facilities Management*. New York: Spon press.
- Beloor, V., Nanjundeswaraswamy, T. and Swamy, D. (2017). *Employee Commitment and Quality of Work*

- Life – A Literature Review. *The International Journal of Indian Psychology*, 4, (2) 175 – 188
- Campbell, L. Z. (2017), "An exploration of how research can aid the development of facilities management", *Facilities*, Vol. 35 No. 5/6, pp. 356-366. <https://doi.org/10.1108/F-04-2016-0037>
- Davidescu, A. A., Apostu, S. Paul, A. and Casuneanu, I. (2020). Work Flexibility, Job Satisfaction, and Job Performance among Romanian Employees— Implications for Sustainable Human Resource Management. *Sustainability*, 12, 6086; doi:10.3390/su12156086
- Edwards, S. (2021). *Examining the Relationship Between Workplace Satisfaction and Productivity*. Retrieved from <https://incafrica.com/library/samuel-edwards-examining-the-relationship-between-workplace-satisfaction-and-productivity>
- Erebor, E. M. Ibem, E. O. Ezema, I. C. and Sholanke, A. B. (2021). Appraisal of Awareness and Implementation Levels of Energy Efficiency Design Strategies for Office Buildings in Abuja, Nigeria. *Civil Engineering and Architecture*, 9(4), 1084-1096. DOI: 10.13189/cea.2021.090411
- Government of India (2019). Manual for Procurement of Works 2019. Retrieved from <https://doe.gov.in/sites/default/files/Manual%20for%20Procurement%20of%20works%202019.pdf>
- Hay, R., Samuel, F., Watson, K. J. and Bradbury, S. (2018) Post-occupancy evaluation in architecture: experiences and perspectives from UK practice. *Building Research & Information*, 46(6), 698-710, DOI: 10.1080/09613218.2017.1314692
- Hou, H. C., Lai, J. H. K., and Edwards, D. (2020). Gap theory based post-occupancy evaluation (GTbPOE) of dormitory building performance: A case study and a comparative analysis, *Building and Environment*, 185, 107312, ISSN 0360-1323, <https://doi.org/10.1016/j.buildenv.2020.107312>.
- Ibem, E. O., Opoko, A. P., Adeboye, A. B. and Amole, D. (2013). Performance evaluation of residential buildings in public housing estates in Ogun State, Nigeria: Users' satisfaction perspective. *Frontiers of Architectural Research*, 2, 178–190
- Irabor, I. E. and Okolie, U. C. (2019). A Review of Employees' Job Satisfaction and its Effect on their Retention. *Annals of Spiru Haret University. Economic Series*, 19(2), 93-114, doi: <https://doi.org/10.26458/1924>
- Isaac A. Meir, I. A., Garb, Y., Jiao, D and Cicelsky, A. (2009). Post-Occupancy Evaluation: An Inevitable Step Toward Sustainability. *Advances in Building Energy Research*, 3(1), 189 – 219, DOI: 10.3763/aber.2009.0307
- Islam, R., Nazifa, T. H. and Mohamed, S. F. (2019). Factors Influencing Facilities Management Cost Performance in Building Projects. *Journal of Performance of Constructed Facilities*, 33(3): 04019036. DOI: 10.1061/(ASCE)CF.1943-5509.0001284.
- Jenkin, G. L. S., McIntosh, J., and Every-Palmer, S. (2021). Fit for What Purpose? Exploring Bicultural Frameworks for the Architectural Design of Acute Mental Health Facilities. *International Journal of Environmental Research and Public Health*, 18(5), 2343. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/ijerph18052343>
- Jimoh, R., Oyewobi, L., Suleiman, B. and Samuel, A. (2019). Assessment of the Utilisation of Post Occupancy Evaluation among Construction Professionals in Abuja-Nigeria. *Journal of Research Information in Civil Engineering*, 16(3), 2754 – 2769.
- Kamarulzaman, N., Saleh, A. A. Hashim, S. Z. Hashim, H., and Abdul-Ghani, A. A. (2011). An Overview of the Influence of Physical Office Environments Towards Employee,

- Procedia Engineering*, volume 20, Pp 262-268
- Kanell, N. (2020). Soft Services in FM. Retrieved from <https://spaceiq.com/blog/soft-services-in-facility-management/>
- Kapur, R. (2018). The Influence of Employee Job Satisfaction on their Performance. Retrieved from [https://www.researchgate.net/publication/323700512\\_The\\_Influence\\_of\\_Employee\\_Job\\_Satisfaction\\_on\\_their\\_Performance](https://www.researchgate.net/publication/323700512_The_Influence_of_Employee_Job_Satisfaction_on_their_Performance)
- Leaman, A., Stevenson, F. and Bordass, B. (2010). Building evaluation: practice and principles, *Building Research & Information*, 38:5, 564-577, DOI:10.1080/09613218.2010.495217
- Leitner, D. S., Sotsek, N. C. and Santos, A. P. L. (2020). Post-occupancy Evaluation in Buildings: Systematic Literature Review. *Journal of Performance of Constructed Facilities*. 34(1), DOI: 10.1061/(ASCE)CF.1943-5509.0001389
- Li, P., Froese, T. M., and Brager, G. (2018). Post-occupancy evaluation: State-of-the-art analysis and state-of-the-practice review. *Building and Environment*. doi: 10.1016/j.buildenv.2018.02.024.
- Manzuma B. M. and Awesiri A. G. (2020): Evaluation of Potential Energy Savings and Emission Reductions from a Typical Building in a Nigerian University Campus. *Environmental Technology & Science Journal*, School of Environmental Technology, Federal University of Technology, Minna-Nigeria. Vol. 11 No. 1, pp 11 – 25
- Manzuma B. M. and Ufwai J. D. (2020): Assessment of Water Efficiency in a Typical Nigerian University Campus. *Journal of Environmental Design*, Journal of the Faculty of Environmental Studies, University of Uyo, Nigeria Vol. 15 No. 2, pp 138 – 147
- Martin, D. M. (2013). A-Z of Facilities and Property Management, 3<sup>rd</sup> Ed. Thorogood Press.
- Mohammed, A. M. and Hassanain, M. A. (2010). Towards Improvement in Facilities Operation and Maintenance through Feedback to the Design Team. *The Built & Human Environment Review*, volume 3, pp 72 – 87
- Moktar, N. and Myeda, N.E. (2022), "Procurement of facilities management services designated for office buildings of airline corporate organisations in Asia", *Facilities*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/F-10-2021-0104>
- 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 University-Erbil, Iraq. *Frontiers of Architectural Research*, 6(3), 412-429, <https://doi.org/10.1016/j.foar.2017.06.004>
- Nwoye, M. I. (2011). *A Focus Group Discussion Approach to the Comparative Analysis of private and Public-Sector Enterprises in Nigeria*. Technovation, pg. 525-534.
- Olivia, G. S. and Christopher, T. A. (2014). In-use monitoring of buildings: an overview and classification of evaluation methods, *Energy and Buildings*, 86, 176 – 189. <http://dx.doi.org/10.1016/j.enbuild.2014.10.005>
- Piriyathanalai, W. and Muenjohn, N. (2012). Is there a link? Employee satisfaction and service quality. *World Journal of Management*, 4(1), 82 – 92.
- Preiser, W.F.E., White, E., and Rabinowitz, H. (2015). *Post-Occupancy Evaluation*. Routledge Revivals
- Reza, E and Suleiman, A. S. (2021). Assessing the Effect of Prefabricated Double Skin Façade on the Thermal Comfort of Office Building to Achieve Sustainability. *Future Cities and Environment*, 7(1): 15, 1–17. DOI: <https://doi.org/10.5334/fce.125>
- Rosenheck, T. (2018). POE for Organizations with a Repetitive Building Type. In: Preiser, W., Hardy,

- A., Schramm, U. (eds) *Building Performance Evaluation*. Springer, Cham. [https://doi.org/10.1007/978-3-319-56862-1\\_14](https://doi.org/10.1007/978-3-319-56862-1_14)
- Sageer, A., Rafat, S. and Agarwal, P. (2012). Identification of Variables Affecting Employee Satisfaction and Their Impact on the Organization. *IOSR Journal of Business and Management*, 5 (1), 32 – 39
- Stroud, K. A. and Booth, D. J. (2007). *Engineering Mathematics, sixth edition*. Palgrave Macmillan Press Ltd, UK. Pp 1146 –1160
- Vischer, J.C. (2018). Building-In-Use Assessment: Foundation of Workspace Psychology. In: Preiser, W., Hardy, A., Schramm, U. (eds) *Building Performance Evaluation*. Springer, Cham. [https://doi.org/10.1007/978-3-319-56862-1\\_10](https://doi.org/10.1007/978-3-319-56862-1_10)
- Zanni, M. A., Soetanto, R. and Ruikar, K. (2016): Towards a BIM-enabled sustainable building design process: roles, responsibilities, and requirements, *Architectural Engineering and Design Management*, DOI: 10.1080/17452007.2016.1213153
- Zimmerman, A. and Martin, M. (2010). Post-occupancy evaluation: benefits and barriers. *Building Research & Information*, 29:2, 168-174, DOI: 10.1080/09613210010016857