

Assessment of the Utilisation of Post Occupancy Evaluation among Construction Professionals in Abuja-Nigeria

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Abstract

Completed projects and occupied buildings are dominated by an attitude of 'never look back' syndrome. Once a building has been completed and handed over, the contractor moves on to the next project and rarely returns to check the performance of the building constructed largely due to non-inclusion of funding for Post Occupancy Evaluation (POE) in the design budgets and it is unclear who has the responsibility to conduct post occupancy evaluation operation. Therefore, the paper assessed the utilisation of POE among construction professionals in Abuja-Nigeria through the self-administration of structured questionnaires. Findings revealed that one of the drivers of POE practice is the application of design skill with greater effectiveness and the factors that affect the implementation of POE practice among construction professionals are structural factors prevalent in the construction industry and cost. There is an understanding among constructional professionals about the various POE methods but the cost of the person responsible for the commissioning and paying for the evaluation is an obstacle. Based on these, it is recommended that since one of the drivers of POE practice is to apply design skill with greater effectiveness, the orientation of all stakeholders should be changed from the immediate gains accruable from completed buildings to long term benefits that will be accruable when POE is incorporated in contractual agreements *ab initio*.

Keywords

Post Occupancy Evaluation, Construction professional, drivers, utilisation, Abuja-Nigeria

1. Introduction

Completed projects and occupied buildings are dominated by an attitude of 'never look back'. Once a building has been completed and handed over, the contractor moves on to the next project and rarely returns to check the performance of the building constructed (Oyeweso, 2011). These could be as a result of one or more of the following, (1) funding for post occupancy evaluation may not be included in the design budgets and it is unclear who has the responsibility to conduct post occupancy evaluation operation (2) interest in the end product can be limited as it is perceived to come too late, in the process the contractor moved on to the next project (3) the owner or clients may not be planning similar projects or considers the lesson learned to be unique to one project (4) there can be significant technical and logical difficulties in obtaining data (5) the post occupancy evaluation reporting may uncover problems possible leading to awkward question or even liability (6) at the very least, design professional do not welcome other professionals reviewing their work with a critical eye (7) time frame for conducting the evaluation is well beyond the traditional scope of work for design and construction contract (i.e. one year after occupancy) (Zimring *et al.*, 2005).

Within the construction industry, surveys indicate that take up is very low, with only 3% of British based architectural practices regularly undertaking POE on housing projects (Clark, 2015). Only 9% of chartered practices offering POE to clients and none generating revenues from POE services (RIBA, 2016). In Nigeria, post occupancy evaluation operation has been restricted to demonstration and research project, without real implementation, these problems must be tackled for any meaningful development to take place in the building construction industry (Dantata, 2008). It is necessary for post occupancy evaluation operation to be encouraged and embedded in our country, which will go a long way to improve our buildings through information gotten from previous project and using it to improve subsequent project (Dantata, 2008). These will enable us as a country to create a sustainable built environment and compete with the global world at large. To achieve these, it has therefore become necessary for post occupancy evaluation to be included or put into consideration during contract and procurement methods which is necessary to examine the performance of the building after completion and use the information from it to improve future project to be carried out (Ezeh, 2011). Therefore, it is necessary to assess the

utilisation of post occupancy evaluation among construction professionals in Abuja with the view of identifying the post occupancy evaluation methods being used and the extent of used by construction professionals; examining the drivers of post occupancy evaluation practice and determining the factors affecting the utilisation of post occupancy evaluation.

2. Review

2.1 Post occupancy evaluation

The construction industry is frequently cited as being inefficient, of poor quality and unable to improve overtime (Farmer, 2016). Central to solving this problem is the capability to learn from and improve on previous projects as an industry (Bordass & Leaman, 2005). In this context, the benefits of post occupancy evaluation are well rehearsed, founded in the need to address the gap in intended and actual performance of buildings (Preiser & Vischer, 2005). Post occupancy evaluation has a significant role in improving the products and process of the construction industry and in ensuring fitness for purpose in terms of environmental and social needs over the long term (RIBA, 2016). There is a general tendency in the construction industry to design and construct buildings to meet higher performance target, due in part to more and stricter demanding building codes requirements and in part to better meet needs and expectation of occupants (Hilaire, 2013). The end product in construction industry is subjected to rapid change in functionality, fitness for purpose, performance requirements and efficiency, there has been a uniform call for more explicit mutual collaboration and learning from the other industries, the response to these changes however appears to be totally different in construction industry (Douglas, 2006). A substantial amount of post construction activities and resources are spent on the performance upkeep of buildings, lack of engagement of designers, builders, and sometimes even procuring clients with building performance may create one-off or chronic problems, which tends to persist or result in innovation target being missed and true success being overlooked even in some of the best buildings (Bordass & Leaman, 2005).

Evaluation is a vital step in producing buildings that fit needs of people and the environments minimizing waste, promoting wellbeing and providing a means to develop an understanding of the social, commercial, cultural and environmental impact of architecture process on client's, occupants and the wider community (Duncan *et al.*, 2016). Regular evaluation is standard in the

most innovative business, post occupancy evaluation can support the design of better appropriate buildings that add value in tangible ways such as reduced environmental impact, reduced running costs and improve user satisfaction (Duncan *et al.*, 2016). Evaluating the performance of new innovative building system and practice applied to newly constructed building can serve to show whether promise benefits are actually delivered by potentially speeding their adoption by the industry and driving regulatory changes (Hilaire, 2013).

In the construction industry, the requirements and attention call for physical and spatial improvement to extend the effective service life of the building, this translates to post occupancy building practices, which can be defined as continuous intervention to minimize obsolescence, dilapidation, deterioration, defiance's in performance and sustainability of buildings (Douglas, 2006). (RIBA) Royal Institute of British Architecture (2016) also agree that helping clients get the best out of their project is the main reason for post occupancy evaluation, it involves the ability to examine the client's motive for embarking on the project and the desired project outcome. Post occupancy evaluation is the general term for a broad-range activity aimed at understanding how building performs once they are built and how satisfied building users are with the environment that has been created (David *et al.*, 2005). Post occupancy evaluation is about reducing waste, enormous amount of money, time effort, energy and resources that goes into creating inappropriate buildings that have to be adapted or demolished only a few years later after completion, only by finding out how our building are behaving can we know how to build better in the future and avoid a rapid increased of the same mistake in the industry (Duncan *et al.*, 2016). Very little information is available in the public domain about the actual service performance of building in general, such information could be useful to identify avenues for improvements to the benefit of building owners and occupants and to develop baseline data on performance indicators to support the development of building codes, regulations and guidelines (Hilaire, 2013). Post occupancy evaluation is putting people and their needs first; we can't make an environment that is good for people without knowing what they want and making sure that they received it from our designs (Duncan *et al.*, 2016).

2.2 Types of POEs

POE may be classified in three types; Indicative POE, Investigative POE and Diagnostic POE (Palm, 2007). (1) Indicative POE 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 quickly interviews few occupants who will quickly give the results, that one wants (Palm, 2007). (2) Investigative POE is once the problem has been identified; POE will be carried out to investigate what the problems are. Once the process has been completed, the data will be presented for a solution (Palm, 2007). (3) Diagnostic POE focuses on the evaluation of critical elements of the building such as the safety of the staircase, lighting and overcrowding in the building. 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 finding revealed by the evaluation will improve the performance of the building (Palm, 2007).

2.3 Drivers of POE

Many drivers exist which justify the claims for the use of POE on a more regular basis. Whyte and Gann (2001) suggest a number of drivers for POE as indicated in the figure below.

2.4 Factors affecting POE practice

Within the construction professional's practice, where the benefits of POE are understood and promoted, research reveals that POE could only be completed on a project by project basis rather than a routine part of all work undertaken (RIBA, 2016). The major issues identified were industry wide, these include the following.

Structural factors in the construction industry: Whilst education and up skilling were seen as important factors in addressing the low take-up of POE, it was wider problems relating to the structure of the construction industry that were seen as fundamental, rather than the behaviour of individual construction professional (Jones & Grigoriou, 2014). These include the 'terrible psychology of short-termism', that is seen to affect an industry driven by quickly realized profits, and efficiency saving in the construction process, rather than long term benefits to client or wider society, the primary time and budget drivers override everything else (Ulrich, 2008).

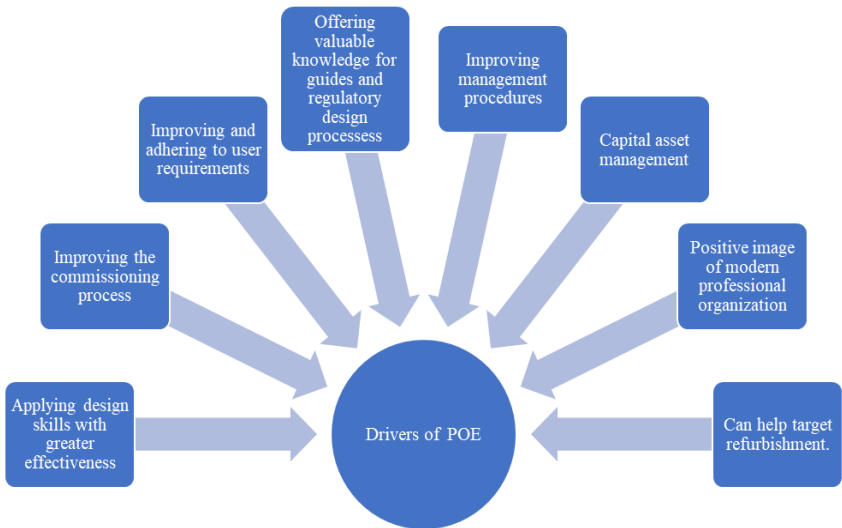


Figure 1 Drivers of POE (Whyte and Gann, 2001)

Insurance and liability: There is a connection here to concerns over liability and reputation, if negative findings are exposed as a result of evaluation which can be, ‘poisonous both commercially and professionally’, most construction professionals reported that they would only attempt to carry out POE with clients with whom they had a particular good relationship (Jones & Grigoriou, 2014). This was related to a concern that POE could focus on the negative aspect of a project at the expense of positive outcomes. The potential of POE to unearth negative findings was seen to be a particular problem from an insurance point of view, insurer have been worried that POEs increase professional indemnity risk (Ulrich, 2008).

Deregulation: The responsibility of policy makers to promote POE was also important, whilst POE has never been main-stream; some British construction professionals felt that during the 2000s, government appeared to take the lead by supporting its use through legislation (Preiser & Vischer, 2005). The retreat from standard such as the code for sustainable homes and zero carbon homes was seen to represent a move away from direct regulation of the private sector organizations such as Building Research Establishment (BRE) were seen to take a key role in generating demand, but there was a

concern expressed that the 'piecemeal adoption' of POE method was not good enough and would not counter the wider drivers shaping construction in the UK (RIBA, 2016).

Need for institutional support : Recognizing that the political trajectory was not likely to move in the direction of regulation, some construction professionals felt that the professional institutes needs to do more to promote POE, RIBA (2016), argue that stronger leadership from the Royal Institute of British Architects (RIBA), with initiatives to make POE a priority had not been promoted vigorously enough. The publication of better and more accessible information by all the professional institutes was seen to be desirable, including guidance covering POE case studies, signposting to existing methodologies and toolkits, provision of POE clause for different types of contract, alongside the incorporation of POE into judging criteria for design and construction awards (Jones & Grigoriou, 2014).

Ownership: Despite all parties appreciating the benefits of the POE, a major issue related the process is who takes ownership? Ownership tends to be deflected by construction professionals with a reluctance to become liable for the associated cost. As the POE process plays no part in standard procurement procedures, there is little motivation for designers to go beyond what is asked of them (Jaunzens *et al.*, 2003). Ownership is deflected from many industry professionals, who are not currently obliged to conduct the evaluation process as part of current procurement process and with the process having the potential to unearth liability claims (Zimmerman & Martin, 2001). This is couple with the culture of fear, blame and conflict which is seen to heavily exist within building procurement (Jaunzens *et al.*, 2003).

Cost: In an attempt to determine who is responsible for the POE process, Cooper (2001) presents two questions which need to be addressed; who is responsible for the commissioning and paying for the evaluation, and who is professionally responsible to carry them out. From the perspective of the client, unless benefits and value are assured then a reluctance to pay for evaluation process will exist. From the perspective of the client, it is felt that any 'testing' associated with the building product to ensure that it is working effectively should have already been paid for (Clark, 2015).

3. Research Methodology

The research employed survey method in its approach using questionnaire to elicit information as the main tool for collating the opinions of the sample of 120 professionals who have responsibilities on construction projects based in Abuja-Nigeria, the study area. One hundred and one (101) numbers of the questionnaires returned by the respondents were used for analysis. The constructs used were derived from the works of Psalm, 2007 and Whyte and Gann, 2001. The data sourced were analysed using basic descriptive statistics; percentages, mean score, and standard deviation. These formed the basis for the conclusion reached and the recommendation made.

4. Results and Discussion

From Table 1 below, the respondents' organization and percentage shows that respondents from both consulting and contracting organization has the highest percentage (58.4%), follow by respondents from contracting organization only with (32.7%), respondents from consulting organization only has the lowest percentage of this study with (8.9%). The professional designation and percentage shows that Civil Engineers has the highest percentage of respondent (33.7%), follow by Builder (24.8%), Architect (16.8%), Quantity Surveyors and Other professional both have (10.9%), Estate Surveyor has the lowest percentage of this study with (3.0%). The qualification of respondents and their percentage shows that respondents with BSc/B Tech has the highest percentage (51.5%), follow by HND, MSc/M Tech and other qualification which are (28.7%), (10.9%) and (7.9%) respectively, while respondents with PhD has the lowest percentage of this study (1.0%). The years of experience and the percentage shows that respondent with 1 – 5 years of experience has the highest percentage (48.5%), 6 – 10 years (35.6%), 11 -15 years (9.9%), 16 – 20 years (5.0%), respondents with above 20 years of experience has the lowest percentage of this study with (1.0%).

Table 1: Background information of respondents

Demographic information	Frequency	Percentage (%)
Organisation		
Consulting	9	8.9
Contracting	33	32.7
Both	59	58.4
Profession		
Architect	17	16.8
Builder	25	24.8
Civil Engineer	34	33.7
Estate Surveyor	3	3.0
Quantity Surveyor	11	10.9
Other	11	10.9
Academic Qualification		
HND	29	28.7
BSc/B Tech	52	51.5
MSc/M Tech	11	10.9
PhD	1	1.0
Other	8	7.9
Years of Experience		
1 – 5 years	49	48.5
6 – 10 years	36	35.6
11 – 15 years	10	9.9
16 – 20 years	5	5.0
Above 20 years	1	1.0

From Table 2, the mean and standard deviation of the extent of familiarity to the POE methods, with decision from mean rating such as “high”, “moderate”, and “low”, were shown. Indicative POE has the highest mean (3.61), follow by investigative POE (2.94), diagnostic POE has the lowest mean score of this study with (2.42).

Table 2: Extent of Familiarity to the Post Occupancy Evaluation Methods

Method	Mean	Std deviation	Decision from mean rating
Indicative POE	3.61	.927	High
Investigative POE	2.94	.892	Moderate
Diagnostic POE	2.42	1.259	Low

From Table 3, the mean and standard deviation of the frequency of use of the POE methods, with decision from mean rating as “moderate”, “moderate”, and “low” were shown. Indicative POE has the highest mean (3.19), follow by investigative POE (2.71), diagnostic POE has the lowest mean of this study with (1.91).

Table 3: Frequency of Used of the POE Methods

Method	Mean	Std deviation	Decision from mean rating
Indicative POE	3.19	.821	Moderate
Investigative POE	2.71	.963	Moderate
Diagnostic POE	1.91	1.105	Low

From Table 4, the mean and standard deviation of the level of agreement for using indicative POE, also the decision from mean rating such as “high” for the six reasons were shown. Experience of professional has the highest mean (4.25), timeframe given by client (4.13), skill expected to carry it out (4.04), the amount the client is ready to pay (3.95), need of the client (3.81), nature of the building has the lowest mean of this study with (3.65).

Table 4 Level of Agreement for using Indicative POE Method

Reason	Mean	Std deviation	Decision from mean rating
Experience of professional	4.25	.830	High
Timeframe given by client	4.13	.945	High
Skill expected to carry it out	4.04	.848	High
The amount the client is ready to	3.95	.887	High
	3.81	.924	High

pay	3.65	.984	High
Need of the client			
Nature of the building			

From Table 5, the mean and standard deviation of the level of agreement for using investigative POE, also the decision from mean rating such as “high” for the six reasons were shown. Experience of professional has the highest mean (3.97), timeframe given by client (3.82), skill expected to carry it out (4.01), the amount the client is ready to pay (4.05), need of the client (3.85), nature of the building has the lowest mean of this study with (3.74).

Table 5: Level of Agreement for using Investigative POE Method

Reason	Mean	Std deviation	Decision from mean rating
Experience of professional	3.97	.806	High
Timeframe given by client	3.82	.899	High
Skill expected to carry it out	4.01	.889	High
The amount the client is ready to pay	4.05	.963	High
Need of the client	3.85	.984	High
Nature of the building	3.74	.986	High

From Table 6, the mean and standard deviation of the level of agreement for using diagnostic POE, also the decision from mean rating such as “high” for the six reasons were shown. Experience of professional has the highest mean (3.60), timeframe given by client (3.64), skill expected to carry it out (3.85), the amount the client is ready to pay (3.93), need of the client (4.06), nature of the building has the lowest mean of this study with (4.21).

Table 6 Level of Agreement for using Diagnostic POE Method

Reason	Mean	Std deviation	Decision from mean rating
Experience of professional	3.60	.939	High
Timeframe given by client	3.64	.996	High
Skill expected to carry it out	3.85	.780	High
The amount the client is ready to pay	3.93	.697	High
Need of the client	4.06	.925	High
Nature of the building	4.21	.962	High

From Table 7, the mean and standard deviation of drivers of post occupancy evaluation practice and decision from mean rating such as “high” and “moderate” were shown. To apply design skill with greater effectiveness has the highest mean (4.41), follow by to improve and adhere to user requirement (4.06), to promote positive image of professional organization (4.00), to help target for refurbishment of building (3.98), to offer valuable knowledge for guides and regulates design process (3.59), to improve management procedure (2.79), to improve commissioning process (2.58), to manage organization capital assets has the lowest mean of this study with (2.54).

Table 7: Drivers of POE Practice

Drivers	Mean	Std deviation	Decision from mean rating
To apply design skill	4.41	1.002	High
To improve and adhere to user requirement	4.06	.858	High
To promote positive image of professional body	4.00	.748	High
	3.98	1.058	High

To help target refurbishment	3.59	.815	High
To offer valuable knowledge	2.79	.875	Moderate
To improve management procedure	2.58	.897	Moderate
To improve commissioning process	2.54	.889	Moderate
To manage capital asset			

From Table 8, the mean and standard deviation of factors affecting POE practice and also the mean rating such as “high” and “moderate” were shown. Structural factor in construction industry has the highest mean (4.62), follow by cost (4.58), ownership (4.22), lack of skill and experience personnel (3.91), technical and logical difficulty in obtaining data (3.84), insurance and liability (3.65), deregulation (3.04), culture/education (3.03), low institutional support (3.01), low level of cooperation among construction professionals has the lowest mean of this study with (2.91).

Table 8: Factor Affecting POE Practice

Factors	Mean	Std deviation	Decision from mean rating
Structural factors in construction industry	4.62	.881	Very high
Cost	4.58	.778	Very high
Ownership	4.22	.932	High
Lack of skill and experience	3.91	.694	High
Technical and logical difficulty in obtaining data	3.84	.784	High
Insurance and liability	3.65	.655	High
Deregulation	3.04	.599	Moderate
	3.03	.932	Moderate
	3.01	.592	Moderate
	2.91	.838	Moderate

Culture/Education
Low institutional
support
Low level of
cooperation

5. Conclusion and Recommendation

The paper assessed the utilisation of post occupancy evaluation among construction professionals in Abuja-Nigeria. Out of the three methods of carrying out POE, the professionals surveyed were most familiar with the indicative POE method which showed in the low frequency of use of diagnostic POE method. The low frequency might deprive the professionals from its overall benefit of improving the performance of buildings. The experience of professionals counted as a major reason for using indicative POE method unlike in investigative POE method that the reason for its use is dependent on the amount the client is ready to pay. In a related development, for diagnostic POE method to be used, the nature of the building and the need of the client are determining factors. There is an understanding among constructional professionals about the various POE methods but the cost of the person responsible for the commissioning and paying for the evaluation is an obstacle. Based on these, it is recommended that since one of the drivers of POE practice is to apply design skill with greater effectiveness, the orientation of all stakeholders should be changed from the immediate gains accruable from completed buildings to long term benefits that will be accruable when POE is incorporated in contractual agreements *ab initio*.

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