Appraising the State of Procurement Methods on Educational Building Projects in Abuja, Nigeria

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ABSTRACT

Asides enhanced success, appropriate choice of procurement method on construction projects reduces the cost. Based on the aforementioned, this study assessed the state of procurement methods adopted on public educational building projects in Abuja, Nigeria between the periods of 2010-2015. The levels of awareness, usage and effectiveness of the existing procurement methods, based on the perceptions of the stakeholders involved on the projects, were the objectives. In achieving the aim, survey method was adopted and 206 questionnaires, designed on a 5-point likert scale, were administered on clients (32), consultants (127) and the contractors (47) associated with the projects. Reliability analysis via alpha model of Cronbach reveals 0.768 for the survey instrument used. Analysis of the data was undertaken by employing percentile, mean item score, ANOVA and Kruskal Wallis H test. It was found that the traditional procurement method topped the list in terms of awareness and usage, being the oldest method. Design and build (MS = 3.83) and traditional procurement methods were found to be effective in enhancing project performance. The respondents had convergent views as to the adoption of procurement methods on projects.

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1. INTRODUCTION

Procurement methods for Construction industry is the organizational structure adopted by client for the management of the design and construction of a building project (Masterman, 2002). Procurement methods also define the management, functional and contractual arrangement and relationship amongst project team. (Turner 2006) opined that the main aim of the construction industry is to deliver and maintain the built environment which comprises housing, educational, industrial, and commercial and infrastructure facilities.

Different procurement methods are used for different construction projects and the correct choice may help to avoid problems and be the key to the attainment of project specific goals (Okunlola & Olugbenga, 2012). Government, private individuals and organizations are investing on education as a means of fostering national development (Federal Republic of Nigeria, 2004). Thus, educational institutions have been established at primary, secondary and tertiary levels, with the hope that the nation's human resources would he transformed into competent and productive agents of development in all sectors of the economy. In order to fulfil the aforestated objectives, educational institutions require an environment where teachers, students and other personnel will enjoy their stay and perform their duties effectively.

The selection of an appropriate procurement method could reduce construction project costs by an average of 5% while an appropriate procurement system may enhance the probability of project success (Luu, Thomas and Chen (2003). In the Nigerian construction industry, project procurement seems to be one of the key areas which have to be developed to a great extent; this is because wrong procurement method often leads to project failure or client's dissatisfaction Love, Skitmore, and Earl (2008). The selection of procurement system therefore becomes a very important task and imperative because the client is faced with various options to procure his project (Okunlola, and Olugbenga, 2012).

2. BRIEF LITERATURE REVIEW
2.1. Procurement Options

Ogunsanmi and Bamisile (1997) as well as Ashwort and Hogg (2007) defined procurement method as the management of the total process involved in construction project delivery. According to Ashwort and Hogg (2007), different variants of procurement are available for meeting different clients' needs and projects specifics. Researchers, however, often differ in these classifications of procurement methods. Ramus (1996), showed that classification

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commonly used, in practice, often combine the characteristics of two or more types. Nonetheless, studies including Seeley (1997), Turner (1997), and Ashwort and Hogg (2007) among others, classified construction procurement methods into two broad categories as: traditional procurement method and non traditional procurement method.

This method allows for all contractors that fill competent to bid for projects in a free and competitive atmosphere similar to competitive market environment. The main aim of every client at the beginning of a project is to ensure that a quality structure is achieved at the end of the project. Babatunde, Opawole and Ujaddighe (2010) asserted that this aim is not met in most cases. Despite the fact that the construction industry in Nigeria is a vital contributor to the process of development, the industry is still characterized by under-performance when compared with other industries. Research has revealed that projects surveyed in Nigeria suffered delays in project performance as a result of defects in the contract documents. The emphasis on procurement methods is on optimizing all parameters involved in project delivery namely, time, cost and quality but sadly in Nigeria, procurement of projects within these constraints has continued to be a challenge to the design team, the contractors, and managers of investments.

Davis, Love and Baccarimi, (2008) stated that a plethora of methods for procuring construction projects are available to meet the needs of clients. Deciding what method to use for a given project is a difficult and challenging task as a client's objective and priorities need to marry with the selected method so as to improve the likelihood of the project being procured successfully. The decision as to what procurement method to use should be made as early as possible and underpinned by the client's business case for the project. The risks and how they can potentially affect the client's business should also be considered. Davis *et al.*, (2008) classified procurement systems as the following two major methods.

2.2. Traditional procurement method

Mathonsi and Thwala, (2012) stated that this method is called "traditional" because it has been in existence for a long time and has been the only choice available for most clients of the construction industry for many years. Using this method, the client enters into an agreement with the design consultant (an architect or engineer) to actually carry out the design work and prepare contract documents. Following the completion of this phase, the contractor is then appointed based upon the owner's criteria and the owner enters into a contract with the successful contractor for the assembly of the project elements. In essence, the client is under two contractual obligations; the design professional and the contractor. Larmour (2011) argues that this method is used to describe procurement which involves the client's design team producing a full construction design.

2.3. Non-traditional procurement systems

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Non-traditional is a generic term which is used to refer to all emerging or contemporary procurement systems of the construction industry other than the traditional procurement system. Over the past numbers of years, the construction industry has undergone changes in a manner never seen before. The increased size and complexity of the construction projects, and information technology are just some of the changes that have been taking place. These changes had led to the development of alternative procurement systems seemed other than the famous traditional one. Although the development of non-traditional procurement systems seemed to be the favourite to most clients of the construction industry, it must, however, be emphasized that there is not yet a specific method used to select the most appropriate procurement system. Masterman (2002) defines a non-traditional procurement system as a diversified contemporary procurement system(s) that not only considers design and construction, but also considers financing, operating and facility management.

3. RESEARCH METHODOLOGY

In this study, a quantitative research design was adopted and it involved the use of questionnaire survey administered on key construction stakeholders. The populations for this research work included 369 participants, comprising the public clients, consultants and contractors, who were involved in the completed public educational building projects for a period of 2010 - 2015 in Abuja, Nigeria according to Table 1.

Table 1: Population and sample size of the respondents

S/N	Respondents	Population	Sample size
1.	Public clients	49	32
2.	Architect (Consultant)	80	44
3.	Quantity Surveyors (Consultant)	50	33
4.	Engineers (Consultant)	100	50
5.	Contractors	90	47
	Total	**369**	**206**

The public clients include F.C.T Education Board, Federal Capital Development Authority (FCDA), Federal Capital Territory Authority (FCTA), Federal Universal Basic Education Board (FUBEB), Millennium Development Goal (MDG), FCT Universal-Basic-Education-Commission (FCT-UBEC), FCT-Secondary-Education-Board. Having ascertained a population of 369, it was reduced using Yamane's 1967 to sample size of 206 (table 1). The analysis of the collected data was carried out using the following descriptive and analytical scientific methods: percentile, mean item score, and Kruskal-Wallis H test. Also the reliability of the research instrument, for questions posed on a 5-point likert scale, was carried out using Cronbach alpha test.

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Table 2: Test of reliability for measuring scale

Scale of measure	Cronbach ∝-value
Level of awareness, usage & effectiveness of procurement methods	0.768

3.1. Test of reliability for measuring scale

Table 2 shows that the Cronbach's α value for scale of measures of the research instruments is 0.768. The instrument used for this research is reliable based on Kothari (2009) that the degree of reliability of the instrument is more perfect as the value tends towards 1.0.

4. DATA PRESENTATION, ANALYSIS AND RESULTS

A total of 206 questionnaires were sent to the identified construction participants, out of which 154 were completed and ascertained fit for analysis. These 154 questionnaires represented a response rate of 75% which is far above the usual response rate of 20-30% for questionnaire surveys in construction management studies according to Akintoye (2000). The demographics of the respondents according to Table 3 shows that 18.2% of the respondents represent the public clients, 53.2% are consultants on the identified construction projects while 28.6% were contractors that handled these projects. The high response from the consultants can be attributed to the fact that they represent a larger portion of the research population and comprise the consultant architects, quantity surveyors and engineers. In terms of profession of all the construction participants, result shows that the most represented profession is engineering with 28.6%. This is followed by quantity surveying and architecture with 25% and 20.5% respectively. The builders were the least represented with 15.9%.

For the years of working experience of the respondents, the average years calculated is 16.5 years while the average numbers of construction projects executed by them us 19.7. This result reveals that the respondents are well experienced in construction related activities.

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Table 3: Background Information of Respondents

Category	Classification	Frequency	Percentage
Category of Respondents	Public Client	28	18.2
	Consultant	82	53.2
	Contractor	44	28.6
	Total	**154**	**100.0**
Profession	Architecture	31	20.5
	Building	26	15.9
	Engineering	54	38.6
	Quantity Surveying	43	25.0
	Total	**154**	**100.0**
Years of experience	1-5	9	5.9
	6-10	27	17.5
	11-15	44	28.6
	16-20	33	21.4
	21-25	10	6.5
	26-30	11	7.1
	Above 30	20	13.0
	Total	**154**	**100.0**
	Average	**16.5**	

4.1. Procurement Options for Educational Building Projects in Abuja, Nigeria

In assessing the various procurement options adopted in procuring educational buildings, some procurement options identified to be suitable for the procurement of buildings were identified from literature. Table 4 shows the ranking of the procurement methods based on the level of awareness of each of the different categories of the respondents. From the table, it is evident that the most popular procurement method, among the three categories of respondents, is the traditional method having the overall mean value of 4.62. This is understandable as it is the oldest method of procurement within the construction industry.

The Design and Build (DB) was ranked second by both the clients and consultants and third by the contractors. The contractors however ranked labour only contract as second. With the present economic situation within the country, the need to achieve public projects through private funding has become necessary. Hence the awareness of public clients as to this method of procurement is expected to have increased over the years. In similar vein, the consultants' high level of awareness of this procurement options is also expected since they act in favour of the client, so as to achieve the client's desire. However in terms of design and build, the contractor plays a major role, as he is awarded the contract to design the proposed structure through the use of his own design team and also construct this structure. Thus, their level of awareness of this procurement system can be expected to be high as seen in the table.

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On the overall however, design and build procurement options were ranked as second and third with and overall mean value of 3.92 and 3.50 respectively. The least ranked procurement option is the design and construct with an overall mean value of 3.28. This procurement option which is a variant of the single source procurement option can therefore be said to be less popular among these respondents unlike the design and build which is also a single source procurement option.

Table 4: Level of awareness of various procurement options

	Clients		Consultants		Contractors		Overall	
Procurement Types	**Mean**	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**
Traditional method	4.61	1	4.63	1	4.59	1	4.62	1
Design and Build	3.93	3	3.88	2	3.98	3	3.92	2
Labour – Only contract	3.18	7	3.77	4	3.2	7	3.5	3
Direct Labour	3.64	4	3.62	5	3.02	8	3.45	4
Construction management	3.61	5	3.45	7	3.27	6	3.43	5
Management contracting	3.21	6	3.46	6	3.41	4	3.4	6
Design and Construct	3.04	8	3.35	8	3.3	5	3.28	7

In terms of the level of usage, result in Table 5 shows that while the clients and consultants stated that the most used procurement type in delivering educational building is the traditional method. However the contractors claim that the most adopted is the design and build. On the overall however, the traditional method was ranked as the most used procurement type with an overall mean value of 4.29. Next to the traditional method are design and build, construction management and management contracting with an overall mean value of 4.28, 4.12 and 4.10 respectively.

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Table 5: Level of usage of various procurement options

Procurement Types	Clients Mean	Rank	Consultants Mean	Rank	Contractors Mean	Rank	Overall Mean	Rank
Traditional method	4.36	1	4.32	1	4.18	2	4.29	1
Design and Build	4.29	2	4.27	2	4.30	1	4.28	2
Construction management	4.07	3	4.22	3	3.98	4	4.12	3
Management contracting	4.04	4	4.13	4	4.09	3	4.10	4
Labour – Only contract	3.71	5	3.72	5	3.70	6	3.71	5
Direct Labour	3.61	6	3.54	6	3.73	5	3.60	6
Design and Construct	3.07	7	3.40	7	3.05	7	3.24	7

Table 6 shows the level of effectiveness of these identified procurement types as observed by the three categories of respondents. Result reveals that all the respondents believe the design and build, and the traditional methods are the two most effective procurement systems in delivering educational buildings. These two procurement types were ranked first and second with a mean value of 3.83 and 3.52 respectively. Reason for this can be based on the fact these are the two most used procurement systems with the educational sector as observed in Table 5. The procurement option with the least level of effectiveness is the Design and Contract (DC) with an overall mean value of 3.24. As stated earlier, this method is the least used in the delivery of educational buildings, thus, the level of its effectiveness may not be known by these respondents. Therefore, the respondents' perception with regards to the effectiveness of none frequently used procurement options in this study, merits a second reflection.

Table 6: Effectiveness of various procurement methods

Procurement Types	Clients Mean	Rank	Consultants Mean	Rank	Contractors Mean	Rank	Overall Mean	Rank
Design and Build	3.57	1	3.89	1	3.89	1	3.83	1
Traditional method	3.46	2	3.50	2	3.59	2	3.52	2
Labour – Only contract	3.04	4	3.06	4	3.32	3	3.13	3
Direct Labour	2.86	6	3.10	3	3.11	4	3.06	4

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Management contracting	2.68	7	3.04	5	2.80	6	2.90	5
Construction management	3.07	3	2.59	7	2.95	5	2.78	6
Design and Construct	2.89	5	2.78	6	2.68	8	2.77	7

5. HYPOTHESIS TESTING

Using data gathered from the level of usage of the identified procurement types, Kruskal-Wallis test which a used in testing the significant difference in the perceptions of the respondents (Client, Consultant and Contractors) as to the use of the various procurement methods towards the delivery of educational buildings. Table 7 shows p-value of 0.912, which means that there is no significant difference in the perceptions of the respondents. The implication of this result is that the respondents had convergent views in selecting the procurement methods.

Table 7: Kruskal-Walis Test Conducted

	Categories of respondents	N	Mean Rank
Usage	Client	8	13.78
	Consultants	8	14.89
	Contractor	8	13.33
	Total	24	
	Chi-Square	0.184	
Test Statistics[a,b]	Df	2	
	Asymp. Sig.	0.912	

6. PROCUREMENT METHODS FOR EDUCATIONAL BUILDING PROJECTS IN ABUJA, NIGERIA

This study shows that construction participants are aware of the traditional method, design & build and the labour-only procurement options. However the most widely used procurement options are the traditional method and design & build among others and this corroborates Enshasi and Modough (2012) acknowledgement of the usage of traditional method and clamour for change from the "lowest price" known to be traditional approach to "multi-criteria selection" approach which can be realised by design and build built method.

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CONCLUSION

The study concludes that the traditional and design & build methods are the most widely used procurement option for the delivery of educational buildings in Abuja, Nigeria. This is not unconnected to the effectiveness of the methods in enhancing the performance of the educational buildings projects in the study area.

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