

STRATEGIES REQUIRED FOR IMPROVING THE BUILDING CONSTRUCTION MANAGEMENT SKILLS OF BUILDING CONTRACTORS IN ENUGU STATE

Dr. Ogbonna, George Nwachukwu

E mail: george.ogbonna@unn.edu.ng
+2347061171800

&

Okanya, Arinzechukwu. V

E mail: arinze.okanya@unn.edu.ng
+2348136349092

Department of Industrial Technical Education
Faculty of Vocational and Technical Education
University of Nigeria, Nsukka.

Abstract

The study was carried out to determine the strategies required for improving the building construction management skills of building contractors in Enugu State. The study adopted a descriptive survey design. Three research questions guided the study. The population for the study was 284 subjects. Simple random sampling was used in choosing the sample size. The sample for the study comprised of 54 registered building contractors and 38 registered site supervisors in Enugu State. Instrument for data collection was a structured questionnaire. The instrument was subjected to face validation by three experts in the department of Industrial Technical Education, University of Nigeria, Nsukka. Cronbach Alpha was used to establish the reliability of the instrument. The liability coefficient of 0.97 was obtained. Data collected were analyzed using the mean and standard deviation for the research questions. Based on the data analyzed, the study identified strategies for improving the building construction management skills of building contractors. The study therefore recommended the following among others; the federal and state ministry of housing should enact a law to make it mandatory for contractors to embark on annual mandatory training, retraining and in-service training to learn advanced, improved method and strategies in building construction. The identified strategies for improving construction management skill of building contractors should be included in the school curriculum of building construction of technical colleges and other higher institutions that teach building technology as a course of study. Government at all levels should set up task force groups to monitor the activities of building contractors to ensure they follow standard procedures in building construction.

Keywords; Buildings, Building Construction, Building Contractor, Construction Management and Site Supervisor.

Introduction

The complexity of building construction projects and the continuous demand for improved and efficient project delivery have put pressure on building contractors, creating a lot of management challenges that require high sense of construction strategies, and management acumen for construction managers. Wallace, (2009) defined building as a relatively permanent enclosed construction over a plot of land, having a roof and usually windows used for wide variety of activities, as living, entertaining, or manufacturing. Buildings serve several needs of society; primarily as shelter from weather, security, living space, privacy, to store belongings, as well as comfortably live and work. Building is the art of assembling materials into a structure. The process of making a building is known as

construction of a building. Hovrvath, (2004) stated that construction projects often suffer from poor performance in terms of time delays, cost overruns, disruptions and quality defects, which is as a result of poor construction management skills of most contractors.

The frequent rates of collapsed building in Enugu State in the past few years have become very alarming and worrisome. Federal Ministry of Housing and Urban Development. (FMHUD, 2016) stated that from 2006 to 2016, there has been an increase in the incidence of building collapse and poor construction practices in major cities of Nigeria such as Enugu, Abuja, Lagos, Kano, and Port Harcourt. Building construction involves proper analysis, planning and

organization by the contractor. Horvath, (2004) stated that most contractors indulge in poor planning, preparation and organization prior to execution of building construction, which eventually leads to loss of lives and properties when these building collapse. Most times, building constructions are carried out by the contractor without approved drawings and no drawings at all in some cases. Allen and Iano, (2014), opined that when building plans are not vetted by qualified professionals before the buildings are erected, it can result to poor construction, building failure and building collapse. For a building to be erected, the client must engage the services of a contractor who organize, plans, start and completes the full construction of the building through proper construction management, (Wallace, 2009).

A contractor is one who agrees to execute a project work for a client based on agreed considerations. According to Ezeji (2008), a contractor is one who agrees to take a contract work from a client after the offer and acceptance, forming contract agreement. The contractor is the builder who is known to have agreed to execute a project work based on agreed considerations (finance). A building contractor is an individual who engages in the planning, developing and coordinating of activities which coincide with the building of structures (Hammond, 2011). The contractor organizes the site and places an agent or site supervisor as the person in charge of the project. The contractor undertakes a project with the aim of gaining after completing the project. In general terms, a contractor could be a person or group of persons who undertakes a contract and uses employees, equipment and materials for construction according to specifications on drawings provided by the client. Mockler, (2012), stated that the building contractor carries out his/her duties by supervising employees, planning how the project will be carried out and completing the project in a manner which coincides with all laws, rules and regulations of building construction. The building contractor uses the site supervisor to execute many of his plans and activities on site during building construction. Ezeji (2008) defined site supervisor as the agent of the contractor and also the administrator in large construction firm. The site supervisor manages the contract work step by step throughout the duration of the contract for the contractor. The job description of a site supervisor entails ensuring the smooth day-to-day operation of the building site even when the contractor is not around. The site supervisor is answerable to the contractor (Mockler, 2012). The site supervisor also assist the contractor or project manager in construction

management by supervising work on site, determining the likely duration of construction work and ways to fast track the project or to reduce cost and other activities in the site.

Construction management is a professional service that uses specialized, project management techniques to oversee the planning, design, and construction of a project, from beginning to the end. The purpose of construction management is to control a project's time, cost and quality. Hammond, (2011) stated that construction management involves organizing, scheduling, mobilizing, and directing equipment, materials and personnel in performance of a construction contract. Halpin, (2011) described construction management as a process in which the interest and efforts of all parties involved in a construction project are integrated and coordinated by a control entity. Nwachukwu (2010) stated that, construction management skills involve continuous involvement and full-time supervision during the actual construction phase, because of the intimate involvement of the construction manager from the projects inception. Construction management according to Ezeji and Onoh (2008), comprised the architectural and engineering services carried out during the pre-design and construction of new facilities. The functions of the contractors reflect the activities involved in managing, planning, decision-making, supervision, organizing, controlling and evaluating. These functions constitute a circle of action in which each component leads to the next, (Kibert, 2007). Since construction projects involve various professionals like architects, engineers, quantity surveyors, builders, surveyors, urban and regional planners, it will be disastrous if there is none to co-ordinate the interest and roles of the stake holders together with other non-professionals and client. Construction management is the key component to every construction project. Moore and Dainty, (2013) stated that the functions of construction management typically include the following; Specifying project objectives and plans, including delineation of scope, budgeting, scheduling, setting performance requirements and selecting project participants; maximizing the resource efficiency through procurement of labour, materials and equipment; implementing various operations through proper coordination and control of planning, design, estimating, contracting and construction in the entire process; developing effective communications and mechanisms for resolving conflicts. The Construction Management Association of America (CMAA, 2013) stated that the most common responsibilities of a construction

manager fall into the following seven categories; project management planning, cost management, time management, quality management, contract administration, safety management and construction management professional practice.

Hence, it is very important for construction managers to possess good construction management skills for proper execution of a building project. Stone, (2011) defined Construction management skills as the art of directing and coordinating human and material resources throughout the life of a project by using modern management techniques to achieve predetermined objectives of scope, cost, time, and quality. According to Gabourne (1999), management skill is the ability to control human and material resource in a construction industry which is usually based on proper planning, coordinating and organization of the resources. The control of the resources in any construction industry therefore is the full responsibility of the contractor, the site supervisor and other parties involved in construction management. Construction management skills involve the planning, coordination, and control over the various tasks involved in construction projects. Construction management combines the responsibilities of a contractor and the site supervisor with the skills and expertise of the construction industry, (Kibert, 2007). Construction management skills are those necessary skills and activities which must be employed by the contractor and site supervisor while carrying out building construction in order to effectively manage the human, material resources and other activities involved in the construction.

Benham, (2014) stated that components of construction management skills of contractors includes; the general construction planning (planning skill), proper organization (organizational skill), supervision and monitoring of conformance to design, specifications, and control/monitoring of compliance of building codes (supervision skill), continual construction safety (safety skill) and evaluation of the work done on site (evaluation skill). Owen, (2007) defined planning skills as any skills that allow a manager to look ahead and accomplish goals or avoid emotional, financial, physical or social hardship, it is the process of deciding in detail how to do something before actually starting to do it. Planning in construction management helps to determine the materials, staff and machines that will be needed for the building project, (Benham, 2014). Organizational skills according to Kooser (2015), involves the assignment of tasks, the grouping of tasks into departments and the assigning of authority with adequate responsibility and

allocation of resources across a company/body/organisation to achieve common goals. Organizing in construction management aids the contractor and site supervisors to effectively delegate tasks and obligations to different sets of workers in building construction, such as the office keepers, general foreman, masons, and other workmen. Supervision skills contains elements of providing knowledge, helping to organize tasks, enhance motivation, and monitoring activity and results, in the construction industry (Jack, 2008). Supervision skills requires stepping out in front with new, creative ideas that save money, increase productivity and establish credibility and respect from employees. In building construction, the contractor must possess good supervision abilities in order to guide, direct and supervise work activities during building construction (Horvath, 2004).

Statement of the Problem

Construction industry in Nigeria is faced with a lot of problems, among which is poor construction management skills. According to Moor and Dainty, (2013) the major weaknesses of construction firms in Nigeria are in the areas of construction management, staff training, awareness, education and skills, objective measurement, feedback and natural use of total quality tools and techniques. Also are the issues of contractors and clients engaging the services of quarks, use of inferior building materials all in the bid to cut costs which usually result in accidents and deaths during and after the construction process. These concerns involving poor management skills and quality in the construction industry have been identified by various researchers. One of the major concerns of the construction industry in Nigeria is the increasing cases of collapsed buildings across the country in recent times. Khan, and Hussain, (2016) stated that the compromising of the professionals in the building industry, failure to comply with the bye laws and building regulations have resulted into the use of substandard material, poor workmanship, incompetent contractors, and non-compliance with specifications/standards by developers/contractors.

The construction industry in Nigeria is one of the biggest industries and any extra cost means huge losses to the contractors and increased cost to the clients (Ade-ojo, and Babalola, 2013). To avoid such loss in construction rework, extensive research on strategies required for improving building construction management skills needs to be conducted to improve the construction process and delivery. The benefits of strict adherence by professionals like Architects,

Engineers, Builders and contractors to the need for improved construction management has not been given the required attention in spite of a major developmental projects (Khan, and Hussain, 2016). Improved strategies for management in Nigerian construction industry is of great importance to achieve overall project cost benefits and effective service delivery, (Aina and Wahab, 2011). It is justified to carry out this research in order to, suggest best practices that improve the required management skills in building construction firms, which in turn result to improved service delivery. The study should be able to fill the gap of skill updates or improvement by contractors and supervisors for effective handling of building construction.

Purpose of the Study

The general purpose of the study was to determine the strategies for improving building construction management skills of building contractors in Enugu State. Specifically, the study determined the following;

1. Strategies for improving the construction planning skills of building contractors.
2. Strategies for improving the organizational skills of building contractors.
3. Strategies for improving the site supervision skills of building contractors.

Research Questions

The following research questions were posed to guide the study;

1. What are the strategies for improving the construction planning skill of building contractors?
2. What are the strategies for improving the organizational skill of building contractors?
3. What are the strategies for improving the site supervision skill of building contractors?

Hypotheses

1. There is no significant difference in the mean responses of registered builders and site supervisors on strategies for improving the construction planning skill of building contractors.
2. There is no significant difference in the mean responses of registered builders and site supervisors on strategies for improving the organizational skill of building contractors.

3. There is no significant difference in the mean responses of registered builders and site supervisors on the strategies for improving the site supervision skill of building contractors.

Methodology

The study adopted a descriptive survey design. Ayua (2006) stated that descriptive survey is one in which a group of people or items are studied by collecting and analyzing data from only a few people or items considered to be representative of the entire population. The study was carried out in Enugu State, Nigeria. Enugu State is in the South East Geo-political Zone of Nigeria. There are 17 local government areas of Enugu State. The local governments include; Aninri, Awgu, Enugu East, Enugu North, Enugu South, Ezeagu, Igbo Eiti, Igbo Eze North, Igbo Eze South and Isi Uzo. Others are, Nkanu East, Nkanu West, Nsukka, Orji River, Udeno, Udi and Uzo-Uwani. The population for the study was 284 subjects, consisting of 158 registered builders and 126 site supervisors in Enugu State. The sample for this study was 102, which consisted of 54 registered builders and 38 site supervisors. Simple random sampling was used in choosing the sample size. Four registered builders and two site supervisors were sampled from the 17 local governments. All registered builders and site supervisors from each of the local government areas were given equal chance of being selected through simple random sampling.

The instrument for data collection was a structured 34 item questionnaire which was developed from literature in order to obtain the data for the study. Section A of the questionnaire consists of the occupation of the respondent with their years of working experience. While section B consist of twenty items of strategies for improving construction planning skills of building contractors, six items of strategies for improving organizational skills of building contractors and eight items of strategies for improving site supervision skills of building contractors.

Three lecturers in the Faculty of Vocational and Technical Education, University of Nigeria, Nsukka validated the research instrument. Cronbach alpha reliability method was used to determine the internal consistency of the questionnaire items and 0.972 was obtained. The data collected were analyzed using descriptive statistics. The mean was used to answer the research questions. Any item of the questionnaire with mean of 3.50 or above was considered agree; while any item of the questionnaire with mean value below 3.50 was considered to be disagree.

Results

Data for answering research questions 1 to 3 were presented in table 1 to 3

Table 1: Mean Responses of respondents on the Strategies for Improving the Construction Planning Skills of Building Contractors. **N = 102**

S/N	Item Statements	\bar{X}	SD	Remarks
1	Defining the scope of work to be done.	4.38	0.82	Agreed
2	Preparing the building plans in line with the town planning and housing codes of the area.	3.95	0.86	Agreed
3	Getting a building permit or an approval from the town planning commission of the area.	4.04	1.09	Agreed
4	Recruiting and Involving qualified, experienced workers and craftsmen for the building construction	4.52	0.54	Agreed
5	Defining and assigning roles, and responsibilities to the workers and lay down strategies on how the activities should be carried out during building construction.	4.46	0.50	Agreed
6	Analyzing the project network or models to determine project duration and identifying critical and non-critical activities.	3.96	0.86	Agreed
7	Testing the soil before embarking on any building construction	2.83	1.28	Disagreed
8	Establishing standards for planning and controlling workers, materials, equipment, costs and income of each work package.	4.10	1.01	Agreed
9	Distinguish between the skilled and unskilled workers to improve the construction management skill of the contractor	4.04	1.09	Agreed
10	Forecasting the project budget allocations for achieving targets assigned to each organizational unit.	4.95	1.15	Agreed
11	Ensuring effective project documentation for future references	3.90	1.03	Agreed
12	Getting feedback from past project to improve the construction strategy of any new building project	4.65	0.48	Agreed
13	Testing building materials to ascertain the quality for effective planning in building construction.	4.76	0.43	Agreed
14	Allocating jobs to workmen according to their area of specialization and work based on their area of interest	3.95	1.08	Agreed
15	Forecasting input resources, production costs and the value of the work done.	4.35	0.87	Agreed
16	Planning and bringing together the designers and the operatives for effective planning during building construction.	3.96	0.86	Agreed
17	Ensuring that the building plans are in compliance with and correct specifications with the taste of the client.	3.75	0.94	Agreed
18	Ensuring the use of standard tools and equipment in execution of work during building construction.	4.54	0.50	Agreed
19	Ensuring that all building materials such as cement, sand and stone which are used for the work are delivered on site on time.	3.65	1.24	Agreed
20	Engaging the services of a skilled site supervisor who can develop a healthy rapport with the workers under him	4.46	0.58	Agreed

\bar{X} = Mean SD =Standard Deviation

Data in Table 1 reveal that 19 out of the 20 items have their mean values ranging from 3.65 to 4.54. This shows that the mean value of each item was above the cut-off point of 3.50, indicating that 19 items were

agreed as strategies for improving the construction planning skills of building contractors. The SD ranged from 0.24 - 1.15 which showed that the respondents are not too far from each other in their responses.

Table 2: Mean Responses of Respondents on the Strategies for Improving the Organizational Skills of Building Contractors.
N = 102

S/N	Item Statements	\bar{X}	SD	Remarks
21	Organizing and briefing the whole workforce/workers on the details of the work before, during and after the project work	3.73	1.16	Agreed
22	Mapping out and locating plant and machine layouts for efficient site layout.	4.67	0.47	Agreed
23	Providing exact storage position for the main equipment and other construction tools in the site.	3.82	0.99	Agreed
24	Designing and providing temporary offices in the construction site.	4.03	1.13	Agreed
25	Designing and providing parking lots for goods, tools and equipment which are used on site.	3.97	1.06	Agreed
26	Designing and providing surface water drainage system in the site and in the building construction.	4.17	1.08	Agreed

\bar{X} = Mean SD =Standard Deviation

Data in Table 2 reveal that all the six items have their mean values ranging from 3.73 to 4.67. This showed that the mean values of each item was above the cut-off point of 3.50, indicating that all the six items were agreed upon as strategies for improving the organizational skills of building contractors. The SD ranged from 0.47 - 1.16 which showed that the respondents are not too far from each other in their responses

Table 3: Mean Responses of Respondents on the Strategies for Improving the Site Supervision Skills of Building Contractors.
N = 102

S/N	Item Statements	\bar{X}	SD	Remarks
27	Conducting pre-construction survey on site, providing general project administration and preparing action plans.	3.93	0.92	Agreed
28	Adequate planning of project activity times, costs and ensuring completion of activities within the deadlines indicated in the contract	3.59	1.11	Agreed
29	Identifying, cautioning and preventing negligence and human errors amongst the workers.	4.76	0.43	Agreed
30	Monitoring poor attitude and bad construction practices of workers to prevent any problems that will occur as a result of their work	4.24	0.43	Agreed
31	Adhering strictly to site inspection schedule and Minimizing abortive construction works.	4.49	0.50	Agreed
32	Supervising the use of quality building materials to ensure that standard materials are used in building construction.	4.76	0.43	Agreed
33	Identifying and preventing poor development monitoring process of some site supervisors	3.83	0.77	Agreed
34	Ensuring good working condition of workers involved during building construction.	4.87	0.34	Agreed

\bar{X} = Mean SD =Standard Deviation

Data in Table 3 reveal that all the 8 items have mean values ranging from 3.53 to 4.87. This showed that the mean values of each item was above the cut-off point of 3.50, indicating that all the 8 items were agreed as strategies for improving the site supervision skills of building contractors. The SD ranged from 0.34-1.11 which showed that the respondents are not too far from each other in their responses.

Discussion of Findings

The findings in Table 1 indicated that 19 strategies were identified for improving the construction planning skills of building contractors, some of which includes:

- a. Establishing standards for planning and controlling workers, materials, equipment, costs and income of each work package;
- b. Engaging the services of a skilled site supervisor who can develop a healthy rapport with the workers under him,
- c. Ensuring that the building plans are in compliance with correct specifications with the taste of the client,
- d. Forecasting input resources, production costs and the value of the work done and allocating jobs to workmen according to their area of specialization and work based on their area of interest . The findings are in line with the opinion of Mbamali, & Okotie, (2012) who stated that ability of the contractor to effectively map out plans for construction practices helps to improve efficiency in the construction industry. Krishnamurthy, & Ravindra, (2010), also found that the ability to attend training and seminars for professional bodies and co-operating with the local town planning authority also can help to improve construction planning skills of building contractors.

The findings in Table 2 shows that 6 strategies were identified for improving the organizational skills of building contractors. Some of them include;

- a. Organizing and briefing the whole workforce/workers on the details of the work before, during and after the project work,
- b. Mapping out and locating plant and machine layouts for efficient site layout,
- c. Providing exact storage position for the main equipment and other construction tools in the site,
- d. Designing and providing temporary offices in the construction site and designing and providing parking lots for goods, tools and equipment which are used on site. These findings are in line with Mockler, (2012), who stated that the ability of the builder to design site layout and assign jobs and

operational activities to workers are part of the activities for improving the organizational skills of contractors in major cities. The findings are also in consonance with the findings of Kerzner, (2000) who states that it is of great importance that an adequate period before starting site operation is made available for organization and co-ordination of equipment and methods. The author added that the ability to galvanize and co-ordinate work activities on site improves the organization skills of building contractors.

The findings in Table 3 indicated that 8 strategies were identified for improving the site supervision skills of building contractors, some of them are;

- a. Conducting pre-construction survey on site, providing general project administration and preparing action plans, adequate planning of project activity times, costs and ensuring completion of activities within the deadlines indicated in the contract, conducting pre-construction survey on site,
- b. Providing general project administration and preparing action plans, adhering strictly to site inspection schedule and Minimizing abortive construction works,
- c. Identifying and preventing poor development monitoring process of some site supervisors and ensuring good working condition and safety of workers involved during building construction. This is in line with Mbamali, & Okotie (2012), who stated that monitoring poor attitude and bad construction practices of workers to prevent any problems that will occur as a result of their practices helps to improve the supervision skills of building contractors. Kerzner, (2000), stated that ensuring the use of quality building materials and use of standard materials improves the site supervision skills of building contractors.

Conclusion

Findings from the study demonstrated that poor management is a real problem in building construction in Nigeria. It reveals a strong negative relationship between poor management skills of contractors and overall poor performance of buildings constructed by these contractors. Strategies for improving the construction planning skill of building contractors includes; obtaining the right of occupancy for the site of the building construction, preparing the building plans in line with the town planning and housing codes of the area and recruiting and Involving qualified,

experienced workers and craftsmen for the building construction. Strategies for improving the organizational skill of building contractors includes; ensuring that topographical survey and contours of the site is effectively carried out before the actual building construction, designing and providing temporary offices, parking lots for goods, tools and equipment which are used on site and Organizing and briefing the whole workforce/workers on the details of the work before, during and after the project work. Strategies for improving the site supervision skill of building contractors, which includes; adequate planning of project activity times, costs and ensuring completion of activities within the deadlines indicated in the contract, conducting pre-construction survey on site, providing general project administration and preparing action plans and Adhering strictly to site inspection schedule and Minimizing abortive construction works.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Contractors and site supervisors should organize regular seminars and meetings for themselves where experienced members can share ideas,

experiences for others to learn and where they can teach and learn new strategies in building construction.

2. The federal and state ministry of housing should provide a policy or law which makes it mandatory for contractors to embark on annual mandatory training, retraining and in-service training to learn advanced, improved method and strategies in building construction.
3. The state and federal ministry of housing should set up task force group which will monitor the activities of building contractors to ensure that they follow standard procedures while carrying out any building construction project.
4. The identified strategies for improving construction management skill of building contractors should be included into the school curriculum of building construction of technical colleges and other higher institution that teach building technology as a course of study. Inclusion of the identified strategies into the curriculum will benefit the students and graduates. It will prepare and enable them have an improved knowledge of management in building construction.

References

- Ade-ojo, C.O. and Babalola A.A.(2013). Cost and time performance of construction projects under the Due process reform in Nigeria. *International journal of Engineering and Science*, 3(6), 1-6.
- Allen, E and Iano, J. (2014). *Fundamentals of Building Construction, Materials and Methods* Fourth ed, John Wiley & Sons Inc, New York, NY.
- Benham Guthrie, (2014). *Basic Research Methods: An Entry to Social Science Research*. New Delhi: SAGE Publications India Pvt Ltd.
- Ezeji, S.C.O.A and Onoh, B.C.E.C (2008). *Construction management*. Enugu, Cheston Agency Press Ltd.
- Federal Ministry of Housing and Urban Development, FMHUD. (2016). *Standard Form of Building Contract*. Abuja: Federal Government of Nigeria.
- Hammond Jewell, (2011). Executive Project Management Structure and the Challenges Facing its Adoption in Building Construction. *International Journal of Architecture, Engineering and Construction*, vol2(3):158-169.
- Halpin Gahlot, (2017). *Construction Planning and Management*. New Delhi: Wiley Eastern Hamburger.
- Horvath, A, (2004) "Construction Materials and the Environment", *Annual Review of Environment and Resources*, Vol. 29, Pp. 181-204
- Jack Subar, (2008). Clients' Assessment of the Quality Performance of Indigenous and Expatriate Construction Contractors in Nigeria. A paper presented at COBRA: The Construction & Building Research Conference of the RICS. Held on 4-5 Sept. 2008, at the Dublin Institute of Technology: RICS.
- Khan,S and Hussain, A (2016). Team integration in Indian Construction Industry. *International Journal of Engineering Technology Science and Research*, 3 (4):189-194.
- Kibert, C. J. (2007), The next generation of sustainable construction, *Building Research & Information*, Vol. 35 No6, Pp. 595–601.

- Krishnamurthy, K. G., & Ravindra, S. V. (2010). *Construction and Project Management: For Engineers, Planners and Builders*. New Delhi.
- Kooser, (2015). *Project Management Maturity in the Construction Industry of Developing Countries*; Bee Publishers, New Zealand.
- Mbamali, I., & Okotie, A. J. (2012). An Assessment of the Threats and Opportunities of Globalization on Building Practice in Nigeria. *American International Journal of Contemporary Research*, vol. (4):143-150.
- Metzger Kerzner, H. (2006). *Applied Project Management: Best Practices on Implementation*. New York: John Wiley & Sons, Inc.
- Mockler O. I. (2012). The Performance of Traditional Contract Procurement on Housing Projects in Nigeria. *Civil Engineering Dimensions*, 8(2):81-86.
- Moore D. R. and Dainty, A. R. J. (1999) Integrated project teams' performance in managing unexpected change events, *Team Performance Management*, vol. 5, no. 7, pp. 212 – 222.
- Nwachukwu C.E (2010). *Curriculum Development and Management in Vocational Technical Education*. Onitsha; Cape Publishers, Int. Ltd.
- Owen Scott, (2007). *Checking the Project Plan*. Construction Management and Economics, New York. Pinston Inco-orperation.
- Stone Bhavikatti, S. (2012). *Building Construction*. New Delhi: Vikas Publishing House Ltd.
- South African Tertiary Institutions. Port Elizabeth: PhD Thesis, *University of Port Elizabeth*.
- Uga Uchegbu (2005). *Environmental management and Protection*. Enugu; Precision Printers and Publishers.
- Wallace, W. (2009). *Project Management*. Edinburgh: Pearson Education Limited.