

An Analysis of Factors Constraining Quality Management of Building Construction Projects in Awka South L.G.A. Anambra State

OZOEMENA MALACHY ONYEBUCHI¹, UDOBI ALEXANDER N²

^{1,2} Department of Estate Management, Nnamdi Azikiwe University Awka, Anambra State, Nigeria.

Abstract- *The study focused on analyzing the factors constraining quality management of building construction projects in Awka South Local Government Area, Anambra State. The specific objectives of the study is to identify the critical management factors constraining quality management of building construction projects in Awka South L.G.A., to examine the effectiveness of staff training in building construction projects, to examine proper project cost planning for successful building construction project and to examine the impact of top management support for successful building construction projects. The study was guided by four research questions and descriptive survey design was adopted. The population of the study consists of 44 Architects, 22 Builders, 20 Quantity Surveyors, 48 Engineers and 23 Estate Surveyors and Valuers. A sample of 157 was adopted which is the total population of major stake holders in real estate project management profession in Awka south. The primary data was collected through structured questionnaire. Descriptive and statistical analysis was adopted; the data collected was analysed using, T-test and one-way analysis of variance (ANOVA). The finding revealed that Labor quality, financial factors, project design, materials, poor planning, poor site supervision, unskilled labour and lack of communication are factors constraining quality management of building construction projects. The research showed how important the contractor and consultant, as well as the owner are in maintaining quality in a building construction project. The researchers recommends among others that the adoption of various improvement measures and technologies in order to adequately combat the challenges most effectively; the use of modern tools and technologies will improve performance and increase quality output.*

The researchers also recommends the use of experienced contractors and skilled labor. Building contractors should be more involved and engaged as there should be adequate site supervision and active management; this affords them the opportunity to ensure total compliance to approved quality standards of projects. The research showed how important the contractor and consultant, as well as the owner are in maintaining quality in a building construction.

Indexed Terms- *Analysis of factors, quality management, building construction, construction project, Awka South, Anambra State.*

I. INTRODUCTION

Projects do not succeed by chance rather; successful project implementation is a result of careful conceptualization, design and implementation, factoring in all the variables which may influence project success in a given locality, Nzekwe, Oladejo and Emoh, (2015).

The British Standard Institution defines quality as “the totality of features and characteristics of a product or service that bear on its ability to satisfy stated and applied needs”, McCabe (1998). Quality can be taken as the degree of goodness or the worth or value of a good, Nwachukwu (2016), El-Sawah (1998). Quality policy is the overall intentions and directions of an organization as regards to quality, as formally expressed by top management, McCabe (1998). Quality management is all activities of the overall management function that determine the quality policy, objectives and responsibilities, and implement them by means such as quality planning, quality control, quality assurance and quality improvement within the quality system, McCabe (1998).

Project Management Body of Knowledge (PMBOK), a guide to the project management, states that project quality management is a subset of project management that includes the process required to insure that the project will satisfy the needs for which it was undertaken. It consists of quality planning, quality assurance and quality control, (A Guide to the Project Management Body of Knowledge, 2000). Quality system on the other hand is defined as “organizational structures, procedures, processes and resources for implementing quality management, McCabe (1998).

Quality has become a very popular subject in recent years due to conceptual changes in the industry. Quality and quality systems are topics which have been receiving increasing attention worldwide, Chan and Tam (2000). The finished product in any industry should be manufactured to a required standard, one that provides customer satisfaction and value for money. The high cost of buildings makes it necessary to ensure quality of the finished product, Chan and Tam (2000). Like the majority of developing economics, Nigeria has been relying completely on the philosophies, methods and techniques concerning quality that were initiated and developed outside the country. These have been accepted and ill-applied without any adaptation to suit the backgrounds of Nigeria as a developing country. Efforts to improve quality in developing countries like Nigeria should be based on methods that stem from their economic and technological backgrounds. Therefore, determining the local construction industry’s viewpoint on the factors which would improve the quality of building construction projects in Nigeria, and the relative importance of each factor, is an essential first step towards establishing methods for a real improvement of building construction projects in Anambra State of Nigeria.

1.1 Statement Of The Problem:

Nigeria has been recording increasing number of collapsed building which could be attributed to poor quality finished products. As many as 1.6 billion people lacked adequate housing (Habitat, 2015). The problems of homelessness in cities around the world defy generalization, essentially because the growth of every city and the way the authorities attempt to manage its growth are rooted in history, culture as well

as politics. Due to the characteristics of the input, output and expectation of building projects during the pre-construction stage, the construction stage and the post-construction stage; cost of poor quality has emerged to be a key issue. Abbasnejad (2013), opined that Poor quality breeds several undesirable effects throughout the entire construction project supply chain, thus by extension the entire life span of a Building project.

When poor quality activities made during the construction processes are discovered, necessitating costly rework and if undetected, may lead to geotechnical and/or structural failures which can have terrible consequences including building collapse, delay, cost overruns, severe injuries and even fatalities. Such poor quality activities can be traced and linked to poor quality management at the construction stage, where the resultant effects may only manifest at a later stage.

According to Oyewande (1992), causes of building failures in Nigeria are attributed as follows; 50 per cent of the causes owing to design faults, 40 per cent to fault on construction site and 10 per cent to product failure. Building failures could be as a result of defects under any or all of the stages in design approval of drawings and the supervision / construction stage.

Quality is affected by shortages of materials, equipment’s, design changes, error in cost estimation, and lack of quality management and lack of budget. The other factors affecting quality are deficiencies in scheduling, inappropriate planning and unclear evaluation standards. The significance of these factors depends on type of projects, working environment and local culture.

Quality management of building construction problems are very common for real estate project industry players in Nigeria including Awka South L.G.A., Anambra State. Over the years, stakeholders in the real estate project industry have tried to proffer solutions to problems of failure, abandonment and collapse of real estate projects with a view to achieving success. There seems not to be an end to such challenge. Since the major step in problem resolution is identification of the problem. It is therefore necessary to analyze independently the factors that

constraint quality management of building construction projects.

1.2 Aim And Objectives Of The Study:

The aim of this work is to analyze the factors constraining quality management of building construction projects in Awka South Local Government Area of Anambra State, with a view to highlighting the critical quality management factors that need to be addressed. To achieve this, aim the following objectives were pursued.

- To identify the critical management factors constraining quality management of building construction projects.
- To examine the effectiveness of staff training in building construction projects.

1.3 Research Questions:

To achieve the above aim and objectives the following questions shall be addressed:

- What are the critical management factors constraining quality management of building construction project?
- How effective is staff training in building construction project?

1.4 Research Hypotheses:

The following hypotheses were postulated in the course of the research; they are:

- Attitude of clients is not among factors constraining quality management of building construction projects.
- Staff training is not effective in building construction projects.

1.5 Study Area:

Awka South L.G.A was created in 1989 from old Awka Local Government Area. It is bounded on the North by Awka North Local Government Area, on the East by Oji–River Local Government area of Enugu State, on the South by Anaocha Local Government Area and on the West by Njikoka Local Government Area. The Land Area is about 180 square kilometres. Its geographical coordinates are 6° 10' 0" North, 7°4'0" East. General Tourist attractions include: Imo–Awka Shrine at Awka, Sacred Water – Ezu–Ngene at Nise and many others. Health Institutions available include: Amaku General Hospital Awka now (Chukwuemeka

Odumegwu Ojukwu University Teaching Hospital), Regina Caeli Hospital (Owned by the Roman Catholic Church), St. Faith Hospital (Owned by the Anglican Diocese of Awka), Health Centres in every community and many private health clinics and maternity homes. The tertiary institutions includes: Nnamdi Azikiwe University Awka and Paul’s University Awka (Anglican Communion). Secondary schools includes: Federal Science and Technical College, 18 Secondary Schools (government owned). 42 Primary Schools (government owned) and many private secondary and primary schools. Natural resources include: Agricultural products, iron ingots and scraps. Awka South L.G.A., comprises nine towns: Amawbia, Awka, Ezinato, Isiagu, Mbaukwu, Nibo, Nise, Okpuno and Umuawulu. Its population according to 2006 Nigerian census is put at 189654, with a projected annual growth of 2.8%, the current population of Awka South is put at 248067.



Fig 1: Map of Anambra showing Awka South L.G.A.

II. LITERATURE REVIEW

2.1 Concept of quality and quality management:

Quality management according to Frank and McCaffer (2002), include all the activities that managers perform in an effort to implement their quality policy. These activities include quality planning, quality control, quality assurance and quality improvement. Quality management ensures continuous quality improvement with a view to ensuring a more desirable future. To Telsang (2004), it is to get rid of poor quality from production rather than get rid of poor quality products.

Bamisile (2004) stated that quality can be measured by clearly laid down requirements. Newlve (1987) and Patemen (2004) used the concept of conformity with requirements as the definition of quality in

construction. Oakland (1984) argued that quality is simply fulfillment of requirements. These are “customers” who have requirements and “suppliers” who should conform to such requirements. In a construction industry, the ultimate customers are the clients while the suppliers are the project team comprising of the consultants and contractors.

There has been much discussion between professionals, groups within the construction industry and clients concerning the performance of the construction industry. The performance of the industry has resulted to defective structures (building, bridges and roads) and the continuous increase in maintenance costs. The public at large believe that the industry has failed to have value for money. Construction projects are said to cost too much, take too long to construct ‘and are too prone to failure resulting in wastage. Quality in construction should affect everybody, poor or bad design, non-conformity with the specified requirement and bad or inadequate maintenance, all come under the heading of levels of quality in our structures.

Below are some of the possible reasons why various parties should be concerned about the quality of buildings (Bamsile, 2004).

- a) Clients
 - Loss in value of the development
 - Disruption to users
 - Increase in maintenance and repair cost (high cost in use)
 - Loss of profits/rents
- b) Designers
 - Loss of market share/good will
 - Payment of compensation
 - Legal fees (professional negligence)
 - Increase in assurance premium
- c) Contractor
 - Waste of time due to rework
 - Disruption of management procedures
 - Loss of profit
 - Loss of bonus by operatives
 - Moral at low level
 - Low productivity

- Liquidated/as ascertained damage liability
- Loss of market share/good will
- d) Construction industry
 - Loss of public confidence
 - Loss of bargaining power
 - Loss international market to competitors
- e) General public
 - Nuisance
 - Delay/disruption to daily activities

2.2 Quality Planning:

Quality planning (Harris and McCaffer, 2002) is a set of activities whose purpose is to define quality system policies, objectives and requirements, and to explain how these policies will be applied, how these objectives will be achieved and how these requirements will be met. According to Telang (2004), the best companies emphasize designing quality into the process so as to reduce the need for inspection or control effects. He further stated that with the quality objectives firmly established and reviews of the basic design and the proposed processes behind him, the quality control engineer will be in better position to plan the necessary quality inspections, control tests on the building materials.

The plan for quality inspections, control, tests involves the quality control engineers in the following activities.

- Provide detailed quality procedures for controlling product quality and process quality
- Establish flow chart and identify-controls check point
- Establish criteria for in-flow products quality inspections, including detailed information for testers and inspection.
- Collaborate with design engineering to reflect quality requirements in purchase, specification and drawings.
- Issue constructions to the receiving department regarding inspection methods and criteria for processed parts and materials.

2.3 Quality Control:

Harris and McCaffer (2002) defined quality control as a set of activities or techniques whose purpose is to ensure that all quality requirements are being met. In order to achieve this purpose, processes are monitored

and performance problems are solved. They also stated that quality control techniques (sampling) to ensure that the work produced and material used are within the tolerance specified.

Telsang (2004) defined quality control as a system for verification and maintenance of a designed level of quality in products or process by careful planning, continuing inspections or monitoring of specific results to ensure conformance with the set quality standard; and taking corrective action so as to eliminate causes of unsatisfactory performance. Quality control can also be referred to as a process that evaluates output relative to a standard and taking corrective action when output does not meet with standard. The activity involved in quality control includes the following:

- Implementation of quality plans into product design, manufacturing in accordance with the customer's (clients) specifications as well as in already established quality standards
- Quality planning and establishment of quality or measurement standards,
- Inspection and control of incoming raw materials to ensure they meet with specification.
- Planning and control to ensure that suitable tools, machines and methods are used and that machines and equipment are performing satisfactorily.
- In press inspection at stage of production.
- Inspection and control of finished products to check on conformance with quality standard and specifications before getting to the customer (client).

Rustom and Amer (2006), study was on Identification of the Factors Affecting Quality in Building Construction Projects in Gaza Strip of Palestine. The aim of the research was to provide clients, project managers, designers and contractors with the necessary information needed to better manage the quality of building construction projects in Gaza Strip. To accomplish the aim, questionnaires were administered to contracting companies, who were registered by contracting union in Gaza Strip and Engineering consulting offices that were also registered by the Engineering Association in Gaza Strip. Data were analyzed using descriptive statistics. Findings show that project owner, site layout,

equipment, environment, site staff, design, financial issues, subcontractors, materials, labor, systems and execution are the main factors influencing quality of building construction projects in Gaza Strip. The research recommended the need for improvements in the aspect of work related to these factors in order to improve quality in Gaza Strip of Palestine.

Tengan, Anzagria, Kissi, Balaara, and Anzagria, (2014), researched on factors affecting quality performance of construction firms in Ghana: Evidence from small scale contractors. The aim of the study is to identify and evaluate by ranking critical factors that influence the quality performance of small scale contractors according their relative importance and recommend measures that will reduce its significance outcome. Data were collected through a self-administered questionnaire, a total number of sixty nine (69) questionnaires were administered to professionals including architects, quality surveyors and engineers engaged by small scale contractors. The study identified fraudulent practices and kickbacks, lack of coordination between designers and contractors and poor monitoring and feedback are ranked as the first three factors that affected quality performance of small scale contractors. The research recommends that monitoring system should be improved at every district offices for the implementation of good construction. The research also recommends that design should be reevaluated before the actual construction through a pre-construction conference in order to do away with unnecessary design that will not ensure quality.

Abas, Khattak, Hussain, Maqsood, and Ahmad (2015), Evaluated Factors Affecting the Quality of Construction Projects in Pakistan. The research was carried out to scrutinize the factors that have triumphed an adverse effect on construction projects. To achieve the above aim, questionnaire was developed based on identified factors and was administered to construction experts. The feedbacks were analyzed using chi-square and weighted mean method (WMM). Continuous improvement, joint working, communication, technical person availability and procurement unit of contractors were identified as the critical factors affecting quality of construction projects in Pakistan. It was recommended that the contractors should acknowledge these factors based on

priority basis when conducting construction projects. Contractors should implement new technologies, build an effective risk team, daily supervise the materials as well as work and introduce supply chain procedure.

III. METHODOLOGY

3.1 Sample Frame

The sample frame was developed from the registers/directory of Anambra State branch of the relevant professional bodies. They are as follows: Architects, Builders, Quantity Surveyors, Engineering and Estate Surveyors. These were randomly chosen from relevant professionals involved in real estate project management in Awka South.

Table 4: Population of major Stakeholders in Real Estate Project Management in Awka

S/N	Names of the Professional Body	Population in Awka.
1	Nigerian Institute of Architects(NIA)	44
2	Nigerian Institute of Building(NIOB)	22
3	Nigerian Institute Of Quantity Surveyors(NIQS)	20
4	Nigerian Society of Engineers(NSE)	48
5	Nigerian Institution of Estate Surveyors and Values(NIESV)	23
6	Total	157

Source: Directory of the respective relevant professional bodies.

3.2 Sample Size:

The population of the study consists of registered members of relevant professional bodies involved in the real estate project management in Awka South L.G.A. The professional bodies are: Nigerian Institute of Architects (NIA), Nigerian Institute of Building (NIOB), Nigerian Institute of Quantity Surveyors (NIQS), Nigerian Society of Engineers (NSE) and Nigerian Institution of Estate Surveyors and Values (NIESV). A total number of 157 professionals in real estate project management reside in the study area. The required sample size from this sample frame was

157, which represents the entire population of each group of professional bodies stated above.

IV. DATA PRESENTATION AND ANALYSIS

The presentations will be done using tables, while the analyses will be done using relevant statistical tools and interpretations.

Table 1: Distribution of departments of organization of respondents

Department of the Organization	Frequency	Percent
Quantity Surveying	15	15.3
Building	17	17.3
Engineering	27	27.6
Architecture	20	20.4
Estate Surveying and Valuation	19	19.4
Total	98	100.0

Table 1. Shows the distribution of departments where the respondents work in their various organizations. From the table, it can be seen that 15.3 percent of the respondents are Quantity Surveyors, 17.3 percent are Builders, 27.6 percent are Engineers, and 20.4 percent are Architects while 19.4 percent are Estate Surveyors and Values. This shows that the respondents are professionals in building whose responses can be trusted and used for this research purpose.

Table 2: Distribution of years of experience of respondents

Years of Experience	Frequency	Percent
1–5 years	48	49.0
6–10 years	22	22.4
11–15 years	15	15.3
16–20 years	9	9.2
21 years and above	4	4.1
Total	98	100.0

Source: Researcher’s Field Survey 2018

Table 9. Has the distribution of number of years of experiences of the respondents; that is, the numbers of years the respondents have worked in/practiced their

various professions. From the table, it can be seen that the respondents have had enough experiences that their views can be used for research of this type; this is because about 49.0 percent of the respondents have practiced between 1 to 5 years, 22.4 percent has practiced between 6 to 10 years, for those who have practiced between 11 to 15 years, they are about 15.3 and those who have practiced for 16 to 20 years are about 9.2 percent while 4.1 percent of the respondents have practiced for 21 years and above.

4.1 Presentation Of Objective One:

The result of objective one will be presented and explained in this; the data Principal Components Analysis (PCA) was performed on the data generated from the questionnaire, and the results answer the objective.

Objective One: To identify the critical management factors constraining quality management of building construction projects. This objective will be met by interpreting the result of the Principal Components Analysis (PCA) for the critical management factors constraining quality management of building construction projects. The result is presented using tables 3 to 5.

Table 3: KMO and Bartlett's Test for Critical Management Factors

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.883
Bartlett's Test of Sphericity	Approx. Chi-Square
	998.917
	Df
	10
	Sig.
	.000

Source: Researcher's Statistical Analysis, 2019

It can be seen from table 10, that the KMO MSA value is 0.883 while the p – value of the Bartlett's test of sphericity is 0.000; with these values, we can go ahead and perform the PCA.

Table 4: Total Variance Explained for Critical Management Factors

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.627	92.549	92.549	4.627	92.549	92.549
2	.259	5.186	97.735			
3	.078	1.565	99.300			
4	.023	.464	99.765			
5	.012	.235	100.000			

Source: Researcher's Statistical Analysis, 2019.

It can be seen that the total variance explained is 92.549 percent; that is, the PCA was able to explain up 92.549 percent information contained by the collected data, from the responses of the respondents. This is contained in table 11.

Table 5: Component Matrix for Critical Management Factors

	Component
	1
Disagreement between the project team members and project stakeholders	.989
Shortages of building material affects quality management of building construction projects	.989
Non conformity with project quality management plan	.977
Variations in the construction project design	.962
Attitude of clients are among factors constraining quality management of building construction projects	.889

Source: Researcher’s Statistical Analysis, 2019.

We can see that from table 5, all the five issues raised are the critical management factors constraining quality management of building construction projects (this is because all the issues loaded highly; greater than 0.50). Also from the table, the major factor is Disagreement between the project team members and project stakeholders, followed by the rest of the others.

4.2 Presentation of Objective Two:

Objective Two: To examine the effectiveness of staff training in building construction projects.

The response to this objective is the result of the PCA for the effectiveness of staff training in building construction projects, as contained in tables 6 to 8.

Table 6: KMO and Bartlett's Test for Effectiveness of Staff Training

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.860
Bartlett's Test of Approx. Chi-Sphericity Square	893.314
Df	10
Sig.	.000

Source: Researcher’s Statistical Analysis, 2019.

We can see that the value of the KMO MSA and p-value of the Bartlett’s test of sphericity as contained in table 6 are 0.860 and 0.000 respectively; with these, we can go on to perform the PCA with the data generated from the responses of the respondents.

Table 7: Total Variance Explained for Effectiveness of Staff Training

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.588	91.770	91.770	4.588	91.770	91.770
2	.222	4.437	96.206			
3	.137	2.731	98.938			
4	.038	.768	99.706			
5	.015	.294	100.000			

Source: Researcher’s Statistical Analysis, 2019.

From Table 7. We can see that the PCA extracted about 91.770 percent of the total variance explained; this is as contained by the table. This implies that the PCA explained about 91.770 percent of the variability in the data from the responses of the respondents.

Table 8: Component Matrix for Effectiveness of Staff Training

	Component
	1
Workshop should be organized in and off sites	.981
Every building construction staff should be professionally qualified	.980
Staff should be encouraged to attend seminars and conferences	.972
Relevant academic qualifications enhances project staff performance	.950
On the job training should be carried out regularly	.905

Source: Researcher’s Statistical Analysis, 2019.

From Table 8. which is the table of the component matrix of the PCA for effectiveness of staff training in building construction projects, it can be seen that all the five issues for the examination of the effectiveness of staff training in building construction projects, they loaded highly. The highest among them is organization of workshops and off sites; that is, the respondents are of the view that when this is done, it will greatly enhance the effectiveness of the staff, more than other issues; but this does not mean that other issues will not enhance the effectiveness of the staff.

4.3 Presentation of Hypothesis One:

Hypothesis One: Attitude of clients is not among factors constraining quality management of building construction projects.

The result of this hypothesis will be taken from the PCA which was performed in Objective One for the critical management factors constraining quality management of building construction projects from the result of the PCA, it can be seen that attitude of clients are among factors constraining quality management of building construction projects; this is because it loaded highly I the PCA result.

With the above, the null hypothesis will be rejected and the alternative will be accepted; therefore the conclusion will be that attitude of clients are among factors constraining quality management of building construction projects.

4.4 Presentation of Hypothesis Two:

Hypothesis Two: Staff training is not effective in building construction projects.

The response to this hypothesis is contained in the PCA performed in Objective Two for the effectiveness of staff training in building construction projects. From the result of the PCA, it will be seen that staff training, when done will effectively and positively affect building construction projects; this is because from the loadings of the variables in the PCA, all the variables loaded highly.

From the result, we will reject the null hypothesis and accept the alternative hypothesis; therefore the conclusion will be that staff training is effective in building construction projects.

V. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

In this chapter, the findings in the study were summarized; recommendations made; and the conclusion drawn.

5.1 Summary of Findings:

From the research carried out, the following findings were derived.

- The critical management factors constraining quality management of building construction projects were seen to be; attitude of clients, shortages of building materials, variations in project design, non-conformity with project quality management plan, and

disagreement between the project team members and project stakeholders, amongst others. It was found that disagreement between the project team members and project stakeholders is the major critical factor constraining quality management of building construction projects in Awka South L.G.A, Anambra State.

- The researcher concluded that an untrained project staff member affects quality management of building construction projects. From table 15, which is the table of the component matrix of the PCA for effectiveness of staff training in building construction projects, it can be seen that all the five issues for the examination of the effectiveness of staff training in building construction projects, loaded highly. The highest among them is organization of workshops in and off sites; that is, the respondents are of the view that if workshops were organized in and off sites, it will greatly enhance the effectiveness of the project staff members.

CONCLUSION

From the analysis done, the following conclusions were drawn: it has been showed that there are factors constraining quality management of building construction projects in Awka South L.G.A Anambra State. The essentials of project staff training, proper project cost planning and impact of the top management support towards the achievement of quality management of building construction projects in Awka south L.G.A were highlighted. The null hypotheses were rejected, hence the attitude of clients are among factors constraining quality management of building construction projects in Awka South L.G.A in Anambra State, staff training is effective in quality management of building construction projects.

RECOMMENDATIONS

The research findings provide working tools in project management practice by analyzing factors that constrains quality management of building construction projects. The following recommendations were made from the findings of the study.

- The local government authority should set up a monitoring team to ensure that project managers do

not compromise on the use of quality products in building construction projects, prevent quacks from carrying out building construction jobs, the right quantity and quality of materials are used and appropriate test of materials are carried out.

- The local government authority should establish enlightenment campaign bodies to enlighten the public on the implications of not adhering to quality management principles in building construction.

REFERENCES

- [1] Abbasnejad, B. (2013). Poor Quality Cost in Construction. Master's thesis in Design and Construction project, Department of Civil and Environmental Engineering Division of Construction Management, Chalmers University of Technology Gothenburg, Sweden.
- [2] Abdel-Razeq, R.H. (1998). Factors Affecting Construction Quality in Egypt. *Journal of construction and Architectural Management*. 3, 220- 227.
- [3] Abdel-Razeq, R.H, El-Dosouky, A.I. and Solaiman, A.M. (2001). A Proposed Method to Measure Quality of the Construction Project. International Exhibition Conference for Building and Construction, Egypt.
- [4] Bamisile, A. (2004). Production Management. Foresight Press Ltd, Lagos, Nigeria.
- [5] Beven, K. (2006). A manifesto for the equifinality thesis. *Journal of hydrology*, 320(1), 18-36.
- [6] Chan, A.P and Tam, C.M. (2000). Factors affecting quality of building projects in Hong Kong. *International Journal of Quality and Reliability Management*, 17(4/5), 423-441.
- [7] David K.C and Kathrivel P. (2015). A study on factors influencing quality of construction projects. *International Journal for Research in Applied science and Emergency Technology* 3, 200 – 207.
- [8] El-Sawah, H. (1998). Quality Management Practices in the Egyptian Construction Industry. International Exhibition Conference for Building and Construction, Egypt.

- [9] Harris, F. and McCaffer, R. (2002). Modern Construction Management. E.P.P Books Series, Accra, Ghana.
- [10] Habitat, (2015). United Nations Global Country Activities Report. <https://homelessworldcup.org/homelessness-statistics/>
- [11] McCabe, S. (1998). Quality Improvement Techniques in Construction. Addison Wesley Longman Limited.
- [12] Newlove, J. (1987). The Achievement of Quality in Building Construction and Management. Chartered Institute of Building UK.
- [13] Nwana, O.C. (1981). Introduction to educational research for students-Teachers Hieneman Educational Books (Nig) Ltd. Ibadan.
- [14] Nwachukwu, C. C. and Emoh, F. I. (2011). Building construction project management success as a critical issue in real estate development and investment. American J Social and Management Sciences, 2(1), 56-75.
- [15] Nwachukwu, C. C. and Nzotta, S. M. (2010). Quality factors indexes: a measure of project success constraints in a developing economy. Interdisciplinary Journal of Contemporary Research in Business, 2(2), 505.
- [16] Nzekwe, J. U., Oladejo E. I and Emoh, F. I. (2015). Project failure as a reoccurring issue in developing countries: Focus on Anambra State, South East, Nigeria. International Journal of Energy and Environmental Research 3(3), 1-20.