



Original Research Article

Evaluation of the Factors Militating Against Adherence to Quality Control in Building Construction in Edo State, Nigeria

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ABSTRACT

This study delved into the multifaceted realm of Quality Control in building construction, encompassing factors affecting adherence and strategic measures for improvement. The study adopted a quantitative survey design with a questionnaire used to solicit information from construction professionals and selected contractors within Edo State. Eighty five (85) were distributed using random sampling technique; fifty nine (59) were returned and considered suitable for analysis. Data analysis was done using relative importance index. Findings underscore the pivotal role of factors like financial resources, materials, and poor intra-organizational communication, leadership, and compatibility standards. The findings also revealed that eliminating non-conformities in all phases and carrying out laboratory test on materials and general awareness are the most important measures. The study recommended that the professionals should well-trained and licensed with a focus on eliminating defects in construction.

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1. INTRODUCTION

Construction Sector plays a major role in the economic growth of a country and occupies an important position in the nation's development plans (Priyadharsan et al., 2020). Construction activities in Nigeria represent 70% of the capital base of the national economy and generate about 65% of her employment opportunities; this is an indication of the importance of the industry within the economy (Abdulkareem et al., 2011). Construction projects are increased rapidly in the recent years, reflecting the interest of public and private sectors. Construction sector is one of the largest contributors to the Gross Domestic Profit (GDP) of

any countries (Priyadharsan et al., 2020). Construction projects are extremely complex process involving a wide range, it generates substantial employment and provides growth impetus to other manufacturing sectors like cement, bitumen, iron and steel, chemicals, bricks, paints, tiles (Priyadharsan et al., 2020). There have been repeated calls for increased “local content” that is, indigenous participation in the construction of capital projects in Nigeria, against the backdrop of foreign firms’ domination of the construction sector (Amadi et al., 2022).

Two major concerns involving project delivery by indigenous construction firms however can be identified; one is the quality of construction output and the quality of construction projects executed by local construction firms in Nigeria as evidenced by the several reported cases of premature building failure (Oyedele et al., 2015; Opara et al., 2017). While the other concern is the widespread notion that unethical performance plagues indigenous construction companies in Nigeria (Amadi et al., 2022). As the market economy has developed, market competition has had an important role of the law of survival of the fittest in every corner. The pressure of construction enterprises from the market and competitors will be greater and greater, as well as the increasing requirements of customers of quality assurance, which requires the construction companies to improve their internal quality, strengthen management, in particular, pay close attention to quality control (Rumane, 2011). Quality in the construction industry refers to strict adherence to standards and degree of excellence.

It can also be defined as the attainment of acceptable levels of performance from construction activities. Quality is the symbol of human civilization and with the progress of human civilization; quality control will play an incomparable role in the business (Amani, 2017). It can be said that if there is no quality control, there is no economic benefit (Amani, 2017). Quality control is concerned with the totality of the attributes of a building which enables it to satisfy needs. Construction projects are an extremely complex process, involving a wide range (Raw, 2021). There are a variety of factors affecting the quality of construction projects, amongst these factors are design, materials, machinery, topography, geology, hydrology, meteorology, construction technology, methods of operation, technical measures, management systems, poor intra-organisational communication, inadequate of real employee empowerment, politics and turf issue, shortage of strong motivation (Rumane, 2011). Because of the fixed project location, large volume and different location of different projects, the poor control of these factors may produce quality problems. Quality Control is concerned with the totality of the attributes of a building which enables it to satisfy needs.

According to Aina et al., (2011) and Mohab, (2018), any client would want to construct a facility of the highest quality and it is the goal of the design team to maximize quality while minimizing cost and time, there is therefore the need for structural and formal systems of construction management to address the aspect of performance, workmanship and quality. During controlling the whole process of construction, only accord with the required quality standards and user promising requirements, fulfilling quality, time, cost, and so on, construction companies could get the best economic effects. Construction team lead must adhere to the principle of quality first, and insist on quality standards, with the core of artificial control and prevention, to provide more high quality, safe, suitable, and economic composite products. Poor construction quality constitutes major challenges, requiring rapid and positive attention from stakeholders. Standards are not adhered to and construction clients are many a times dissatisfied with projects done (Arowolo et al., 2019). Continuous improvement is a key factor to reduce quality cost and a key factor to ensuring quality is a corrective action. Quality control is achieved by continuously improving the construction, production and business process of an organization.

According to Arowolo et al., (2019), quality control is optimized by: Viewing all work as process, whether it is associated with production or process, making all processes effective, efficient, and adaptable, anticipating change in customer need, controlling in-process performance using metrics such as scrap and cycle time, and monitoring tools such as control chart, maintaining constructive dissatisfaction with the present level of performance, eliminating waste and rework wherever it occurs, investigating activities that do not add value to the product or service, with the aim to eliminate those activities, eliminating nonconformities in all phases of everyone’s work, even if the increment of improvement is small, using benchmarking to improve competitive advantage, innovating to achieve breakthrough, holding gains so there

is no regression, incorporating lesson learned into future activities, using technical tools such as statistical process control (SPC), experimental design, benchmarking, and so on, enforcement of quality control clauses by authorized agencies, designers, contractors and approving agencies should be reprimanded for defects and violation of building regulations, withdrawal of licenses of professionals for any defects in construction, provision of adequate budgetary allocation, carrying out laboratory test on materials and general awareness, training and change in attitude of workers. The problem of the lack of adherence cannot be overemphasized and hence the deliberate need for it to be addressed. The aim of this study is to evaluate factors militating against adherence of quality control principles in construction with a view of enhancing the Quality delivery of construction projects.

2. METHODOLOGY

The questionnaires were used in this research to gather information. Several steps were taken to complete the questionnaires for this research including finding objectives of the survey, determining sampling group, designing the questionnaire, administering the questionnaire and interpreting the results. The questionnaires were administered directly by the researcher with the assistant of professional colleagues in the study area. However, a total population of one hundred and eight (108) was obtained from the study area, out of which eighty five (85) were chosen using the formula of Yamane (1967) to determine the sample size. Random sampling of the described population was used for the study because every member stands an equal chance of being selected and it minimises bias. The questionnaire was drawn on a 5-points Likert scale and it was chosen for ease and uniformity of response and the questionnaire comprised only closed ended questions. Questions were asked on the background information of the respondents, factors militating against the compliance with quality control in building construction and measures taken to ensure strict compliance with quality control in construction projects. Eighty five questionnaires were distributed; fifty nine (59) questionnaires were returned and considered suitable for analysis which represented a healthy return rate of sixty nine percent (69%). The relative importance index was used to rank the factors militating against the compliance with quality control in building construction and measures taken to ensure strict adherence to quality control in construction projects.

The analysis was aided by the use of statistic package for social science (SPSS) application. Based on the content of the questionnaires, the analysis was divided in to two sections: demographic and main objectives. The background information of respondents was analysed by means of frequency distribution and percentage. The relative importance index (RII) was used to rank the factors militating against the adherence to quality control in building construction and measures taken to ensure strict compliance with quality control in construction projects because it best fits the purpose of this study. The formula in Equation (1) was used to determine relative importance index.

$$RII = \frac{\sum W}{A*N} \quad (0 \leq RII \leq 1) \quad (1)$$

Where W is the weight given to each classification by the respondents

A is the highest weight (that is 5 in this case)

N is the total number of respondents

3. RESULTS AND DISCUSSION

Table 1 Presents summary of background information of the respondents. Analysis in Table 1 shows that majority of the respondents 21 (35.6%) participated in survey were contractors, followed by public clients and consultants with 18(30.5%) and 14 (23.7%) respectively. Results also shows that 19 (32.2%) were engineers, 18 (30.5%) were quantity surveyors, 11 (18.6%) were builders while 8 (13.6%) were architects. Table1 shows that all the respondents were affiliated to relevant professional bodies in their respective professions. Out of which 28 (47.5%) of them have attained corporate membership grade while 27 (45.7 %) of the respondents were graduate/probationer members of their respective professional bodies. It shows that they are capable to provide vital information on the objectives of this research. Analysis inTable 1 reveals

that 19 (32.2%) 15 (25.4%) and 12 (20.3%) of the respondents had M.Sc/M.Tech, B.Sc/ B. Tech and PGD degrees respectively. About 10 (17%) were HND holders, while 3 (5.1) have PhD. Table 1 above shows the respondent's number of years of experience in their various professions, 20 (33.9%) falls within 6-10 years, 14 (23.7%) falls within 11-15 years, 12 (20.3%) falls within 16-20 years, 8 (13.6%) falls within 20 years and above while 5 (8.5%) falls within 1-5 years. Therefore, the respondents are considered adequate and reliable for this research.

Table 1: Summary of background information of the respondents

Category	Classification	Frequency	Percent
Type of Organization	Public client	18	30.5
	Consulting	14	23.7
	Contracting	21	35.6
	Private client	6	10.2
	Total	59	100.0
Profession of Respondent	Quantity surveyors	18	30.5
	Architects	8	13.6
	Builders	11	18.6
	Engineers	19	32.2
	Others specify	3	5.1
Total	59	100.0	
Professional body of affiliation	NIA	8	13.6
	NIQS	17	28.8
	NIOB	10	16.9
	NSE/COREN	18	30.5
	Others	6	10.2
Total	59	100.0	
Professional membership Grade	Graduate/Probationer	27	45.7
	Corporate	28	47.5
	Fellow	4	6.8
Total	59	100.0	
Highest academic qualification of respondent	HND	10	17.0
	B.sc/B.Tech	15	25.4
	PGD	12	20.3
	M.sc/M.Tech	19	32.2
	PhD	3	5.1
Total	59	100.0	
Years of working Experience	1-5 years	5	8.5
	6-10 years	20	33.9
	11-15 years	14	23.7
	16-20 years	12	20.3
	Over 20 years	8	13.6
Total	59	100.0	

Table 2 shows factors militating against the adherence to quality control in building construction. The analysis in Table 2 shows the relative importance index and ranking of the factors militating against the adherence to quality control in building construction. The findings revealed that money, materials, inadequate of time devote quality, failure to manage quality in briefing, designing and specification phases of building projects, poor intra organizational communication, management, machines used in construction and methods of construction as the top ranked factors with relative importance index of 0.189, 0.184, 0.182, 0.178, 0.175, 0.171, 0.169, 0.167 and 0.165 respectively. While the least ranked factors were inadequate of leadership, inadequate of formalized strategic plan for change, having the right people to do the job which

is required, compatibility between standards provided by different firms and politics and turf issues with relative importance index of 0.149, 0.146, 0.144, 0.143 and 0.142 respectively. This aligns with previous research, such as Raw (2021), which likely emphasized the importance of budgeting and resource allocation for quality control. The availability and quality of construction materials play a crucial role in maintaining quality standards. This finding is consistent with Mohab (2018), who emphasized the significance of materials in construction quality. Time constraints impacting quality control resonate with the findings of Ameh et al., (2010). This suggests that tight project schedules can hinder effective quality management. The ranking of "Lack of time devoted to quality" was also identified as a top-ranked issue. This finding aligns with the observation made by Priyadharsan et al., (2020) that time management is a critical aspect of construction projects. When time is not allocated for quality control, it can lead to rushed work, errors and ultimately compromise the project's quality. Lack of formalized strategic plan for change and materials were both ranked at the second position. This is consistent with the notion put forth by Amadi et al., (2022) that a well-defined strategy for adapting to changes during construction is essential.

Table 2: Factors militating against the adherence to quality control in building construction

Identified factors	RII	Ranking
Financial resources	0.189	1 st
Materials	0.184	2 nd
Lack of time and devote quality	0.182	3 rd
Failure to manage quality in briefing, designing and specification phases of building projects	0.178	4 th
Poor intra organizational communication	0.175	5 th
Management	0.171	6 th
Machines used in construction	0.169	7 th
Methods of construction	0.167	8 th
Inadequate of employee trust in senior management	0.165	9 th
Drive for short term financial results	0.164	10 th
Inadequate of real employee empowerment	0.162	11 th
Inadequate of strong motivation	0.160	12 th
View of quality program as a quick fix	0.157	13 th
Inadequate of customer focus	0.155	14 th
Lack of companywide definition of quality	0.154	15 th
Lack of leadership	0.149	16 th
Lack of formalized strategic plan for change	0.146	17 th
Having the right people to do the job which is required	0.144	18 th
Compatibility between standards provided by different firms	0.143	19 th
Politics and turf issues	0.142	20 th

Table 3 presents measures to be taken to ensure strict adherence to quality control in construction projects. The analysis in Table 3 above shows the relative importance index and ranking of the measures to be taken to ensure strict adherence to quality control in construction projects. The findings revealed that the most significant measures were eliminating non-conformities in all phases of everyone's work even if the increment of improvement is small, carrying out laboratory test on materials and general awareness, withdrawal of licenses of professionals for any defects in construction, innovating to achieve breakthrough, using benchmarking to improve competitive advantage, continuously improving the construction, production and business process and provision of adequate budgetary allocation with relative importance index of 0.180, 0.178, 0.175, 0.174, 0.172, 0.168 and 0.167 respectively. While holding gains so there is no regression and using technical tools such as statistical process control, experimental design and benchmarking with relative importance index of 0.143 and 0.141 respectively. These findings resonate with previous research conducted by Opara et al., (2017), Amani (2017), Arowolo et al., (2019), and Zane (2005) which also emphasized the significance of stringent quality standards, continuous improvement, and accountability within construction projects. Additionally, the inclusion of innovation and benchmarking in the top ranks aligns with the idea

that staying competitive and achieving breakthroughs in quality control demand innovation and comparative analysis against industry standards.

Table 3: Measures to be taken to ensure strict adherence to quality control in construction projects

Identified measures	RII	Ranking
Eliminating nonconformities in all phases of everyone's work, even if the increment of improvement is small	0.180	1 st
Carrying out laboratory test on materials and general awareness	0.178	2 nd
Withdrawal of licenses of professionals for any defects in construction	0.175	3 rd
Innovating to achieve breakthrough	0.174	4 th
Using benchmarking to improve competitive advantage	0.172	5 th
Continuously improving the construction, production and business process	0.168	6 th
Provision of adequate budgetary allocation	0.167	7 th
Enforcement of quality control clauses by authorized agencies, designers	0.164	8 th
Viewing all work as process, whether it is associated with production or process	0.161	9 th
Training and change in attitude of workers	0.159	10 th
Making all processes effective, efficient and adaptable	0.158	11 th
Anticipating change in customer need	0.155	12 th
Controlling in process performance using metrics such as scrap and cycle time and monitoring tools such as control chart	0.153	13 th
Using benchmarking to improve competitive advantage	0.152	14 th
Investigating activities that do not add value to the product or service, with the aim to eliminate those activities	0.149	15 th
Holding gains so there is no regression	0.148	16 th
Using technical tools such as statistical process control, experimental design, benchmarking and so on	0.143	17 th

4. CONCLUSION

In conclusion, this comprehensive study offers a nuanced understanding of the challenges to Quality Control in building construction and the strategic measures necessary for improvement. The study reveals the critical importance of various factors, including materials, financial allocation, and communication, leadership, and compatibility standards, in shaping the quality landscape of construction projects. These findings underscore the complex interplay of variables in the construction industry, emphasizing the need for a multifaceted approach to quality control. It is evident that achieving and maintaining high-quality standards requires a concerted effort from all stakeholders involved. As the construction industry continues to evolve, the insights derived from this study serve as a valuable resource for practitioners, policy-makers, and researchers alike. By implementing the recommended strategies, such as strategic planning, leadership development, and innovative practices, the construction sector can aspire to elevate its quality control standards and, consequently, enhance the overall performance of building construction projects. This research provides a solid foundation for future endeavours aimed at advancing quality control in construction and underscores the critical role of research and collaboration in addressing the multifaceted challenges of the industry. Based on the findings, the study recommends the following: Allocate sufficient budgetary resources to support quality control initiatives, ensuring the availability of quality materials and skilled labour. Improve intra-organizational communication to facilitate collaboration among project stakeholders and streamline information flow. Encourage innovative approaches in construction processes to achieve breakthroughs in quality control. Ensure that professionals are well-trained and licensed, with a focus on eliminating defects in construction.

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6. CONFLICT OF INTEREST

There is no conflict of interest associated with this work.

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