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RESEARCH ARTICLE

Impact Of Non-Professional Labour and Professional Role Imbalance on Construction Costs

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ABSTRACT

The construction industry in developing countries continues to experience cost overruns, poor quality delivery, and maintenance challenges resulting from the engagement of non-professional labour and the imbalance of professional roles during project execution. This study examined the effects of these practices on construction costs and whole-life costing from the perspective of Quantity Surveying professionals in Owerri, Imo State, Nigeria. A descriptive survey research design was adopted, and structured questionnaires were administered to construction professionals comprising architects, engineers, builders, project managers, and quantity surveyors. Thirty-one valid responses were analyzed using descriptive statistics and percentage analysis. The findings revealed that although the engagement of non-professional labour may reduce initial construction costs, it significantly increases whole-life costs through poor workmanship, frequent maintenance, rework, and reduced durability of construction projects. The study also established that professional role imbalance weakens cost planning, financial accountability, and effective project control, thereby reducing value for money. The study concludes that sustainable construction delivery requires the active involvement of qualified professionals throughout the project lifecycle. It recommends stronger enforcement of professional regulations, improved role definition, continuous training of construction personnel, and wider adoption of whole-life costing as a decision-making tool for achieving sustainable construction outcomes.

Keywords: *Construction cost; Whole-life costing; Quantity Surveying; Professional labour; Sustainable construction; Nigeria*

1. INTRODUCTION

The construction industry is widely recognized as a major driver of economic growth, infrastructure development, and employment generation in both developed and developing countries. In Nigeria, the sector contributes significantly to national development through the provision of residential, commercial, industrial, and public infrastructure. Despite its

importance, the industry continues to face persistent challenges such as cost overruns, poor workmanship, project delays, quality deficiencies, and escalating maintenance costs, which negatively affect project performance and sustainability (Ashworth & Perera, 2018; Ofori, 2015). One of the major factors contributing to these challenges is the increasing engagement of non-professional labour in construction activities. In many developing countries, clients and contractors often employ unskilled or inadequately trained workers to reduce initial construction costs. Although this practice may provide short-term financial savings, it frequently results in poor workmanship, material wastage, construction defects, rework, and increased maintenance costs over the operational life of buildings (Durdyev & Mbachu, 2018; Windapo, 2016). Consequently, the apparent reduction in initial construction costs is often offset by significantly higher whole-life costs, thereby diminishing the economic value of construction investments. Another critical challenge facing the construction industry is professional role imbalance. Construction projects require effective collaboration among architects, quantity surveyors, engineers, builders, and project managers, each of whom performs specialized functions essential for successful project delivery. However, when professional responsibilities are transferred to unqualified personnel or when qualified professionals are excluded from key project decisions, project coordination, financial accountability, and quality management are adversely affected (Love et al., 2016; Ashworth & Perera, 2018). Such practices increase the likelihood of project delays, cost overruns, disputes, and poor project outcomes.

From the perspective of Quantity Surveying, effective cost management extends beyond the estimation of initial construction costs. Modern construction practice emphasizes whole-life costing (WLC), which evaluates the total costs associated with acquiring, operating, maintaining, repairing, replacing, and disposing of a facility throughout its economic life (Flanagan & Tate, 1997; Potts, 2008). Whole-life costing enables clients and project teams to make informed investment decisions by considering long-term economic implications rather than focusing solely on initial capital expenditure. According to the International Organization for Standardization (ISO 15686-5, 2017), life-cycle costing is an essential component of sustainable asset management because it supports value-for-money decisions and promotes efficient resource utilization. Human Capital Theory provides a useful theoretical perspective for understanding the relationship between professional competence and construction project performance. Schultz (1961) and Becker (1993) argued that investments in education, training, and professional expertise enhance productivity, efficiency, and organizational performance. Within the construction industry, this theory suggests that engaging qualified professionals throughout the project lifecycle improves project planning, cost control, quality assurance, and long-term sustainability, whereas reliance on inadequately trained personnel increases the risk of defects, inefficiencies, and higher lifecycle costs.

Although several studies have examined labour productivity and construction cost performance, limited empirical research has specifically investigated the combined effects of non-professional labour and professional role imbalance on construction costs and whole-life costing within the Nigerian construction industry, particularly in Imo State. This gap in knowledge highlights the need for empirical evidence to support policies and professional practices that promote sustainable construction delivery. Therefore, this study evaluates the impact of non-professional labour and professional role imbalance on construction costs and whole-life costing of construction projects in Owerri, Imo State, Nigeria. The findings are expected to contribute to professional practice by providing evidence-based recommendations for improving cost management, enhancing interdisciplinary collaboration, and promoting sustainable construction development. The study was guided by the following objectives: to examine the effects of professional role imbalance on construction cost control, to assess the importance of whole-life costing in sustainable construction project delivery, to determine the influence of non-professional

labour on the whole-life cost of construction projects, to recommend strategies for improving construction cost efficiency through effective professional engagement.

2. LITERATURE REVIEW

The construction industry is multidisciplinary in nature and depends on the coordinated efforts of professionals such as architects, quantity surveyors, engineers, builders, and project managers to achieve successful project delivery. Each professional contributes specialized expertise that collectively influences project cost, quality, time, safety, and sustainability. According to Ashworth and Perera (2018), effective collaboration among construction professionals is fundamental to achieving efficient cost planning, contract administration, and financial control. Similarly, Ofori (2015) observed that the quality of construction project delivery is closely linked to the competence and coordination of the professionals involved. The Quantity Surveyor occupies a central position in construction cost management because the profession encompasses cost planning, estimating, procurement advice, contract administration, valuation of work, financial reporting, and lifecycle cost analysis. These responsibilities enable clients to make informed financial decisions throughout the project lifecycle. Ashworth and Perera (2018) emphasized that the exclusion of Quantity Surveyors from key project decisions frequently results in poor cost forecasting, ineffective financial management, and budget overruns. Consequently, the appropriate engagement of Quantity Surveyors contributes significantly to value for money and sustainable project delivery.

Despite the recognized importance of qualified professionals, the engagement of non-professional labour remains widespread in many developing countries, including Nigeria. This practice is often motivated by attempts to reduce initial construction costs or address shortages of skilled labour. However, research has consistently shown that reliance on unskilled or inadequately trained personnel contributes to poor workmanship, increased material wastage, construction defects, low productivity, and project delays. Durdyev and Mbachu (2018) identified labour competency as one of the major determinants of construction productivity, while Windapo (2016) found that the availability of skilled labour has a direct influence on project quality, safety, and overall performance. These findings indicate that any short-term savings achieved through the engagement of non-professional labour are often offset by higher maintenance, repair, and replacement costs during the operational life of the facility. Professional role imbalance represents another important challenge affecting construction project performance. Professional role imbalance occurs when responsibilities assigned to qualified professionals are transferred to individuals without the required competence or when professionals are excluded from critical stages of project planning and implementation. Such practices weaken coordination among project participants, reduce accountability, and increase the likelihood of disputes, cost overruns, and project failure. Love et al. (2016) argued that ineffective professional coordination remains one of the major causes of construction inefficiency, while Aghimien et al. (2022) reported that inadequate professional participation negatively affects project quality, cost control, and organizational performance. These observations reinforce the importance of clearly defined professional responsibilities throughout the construction process.

Modern construction cost management extends beyond minimizing initial construction expenditure to considering the total cost incurred throughout the life of a facility. This philosophy is embodied in Whole-Life Costing (WLC), which evaluates the costs associated with planning, design, construction, operation, maintenance, repair, replacement, and eventual disposal of a building. Flanagan and Tate (1997) described WLC as a decision-making approach that considers both capital and operational costs to determine the most economically efficient alternative over the life of an asset. Potts (2008) similarly emphasized that lifecycle costing enables clients to achieve long-term value rather than focusing exclusively on initial project costs. The principles of WLC have become increasingly important in sustainable construction because they support informed

investment decisions and efficient resource allocation. The international standard on service-life planning, ISO 15686-5, also recognizes lifecycle costing as an essential component of sustainable asset management.

Recent research has further strengthened the importance of whole-life costing in the construction industry. A systematic review by Samarasekara et al. (2024) concluded that accurate whole-life cost estimation depends on understanding the interrelationships among design decisions, maintenance requirements, operational performance, environmental conditions, and user needs. In addition, Yousfi, Poirier, and Forgues (2025) observed that wider adoption of WLC is often constrained by fragmented data, inconsistent methodologies, and the absence of standardized information systems, emphasizing the need for improved professional collaboration and structured decision-making frameworks. These findings support the argument that effective implementation of WLC requires both competent professionals and integrated project management practices.

The theoretical foundation of this study is Human Capital Theory, developed by Schultz (1961) and further expanded by Becker (1993). The theory argues that investments in education, professional training, technical knowledge, and practical experience improve individual productivity and organizational performance. Within the construction industry, Human Capital Theory suggests that projects executed by competent professionals are more likely to achieve effective cost control, quality assurance, and sustainable outcomes than projects relying heavily on inadequately trained personnel. The theory therefore provides an appropriate framework for explaining how professional competence influences construction costs and whole-life costing.

Overall, the reviewed literature demonstrates that professional competence, effective role allocation, and the application of whole-life costing are closely interconnected determinants of construction project success. Although previous studies have separately examined labour productivity, professional practice, and lifecycle costing, there is limited empirical evidence on the combined effects of non-professional labour and professional role imbalance on construction costs and whole-life costing within the Nigerian construction industry. This gap provides the justification for the present study.

3. MATERIALS AND METHODS

Research Design

This study adopted a descriptive cross-sectional survey design to investigate the impact of non-professional labour and professional role imbalance on construction costs and whole-life costing of construction projects in Owerri, Imo State, Nigeria. A descriptive survey design was considered appropriate because it enables researchers to obtain information from respondents regarding their opinions, experiences, and practices without manipulating the study variables (Creswell & Creswell, 2018). The design is widely used in construction management research where the objective is to describe existing conditions and relationships among variables.

Study Area

The study was conducted in Owerri Municipal, Owerri North, and Owerri West Local Government Areas of Imo State, Nigeria. These three Local Government Areas constitute the metropolitan area of Owerri and have experienced considerable residential, commercial, and institutional construction activities over the past decade. The concentration of consulting firms, contracting organizations, government agencies, and registered construction professionals within the study area provided an appropriate environment for investigating professional practices relating to construction cost management and whole-life costing.

Population of the Study

The target population comprised registered construction professionals actively involved in building construction projects within the study area. These professionals included Quantity Surveyors, Architects, Civil/Structural Engineers, Builders, and Project Managers working in consultancy firms, contracting firms, and government establishments. The selection of these professionals was based on their direct involvement in planning, design, cost management, and project execution.

Sample Size and Sampling Technique

A simple random sampling technique was adopted to select respondents from the study population. According to Creswell and Creswell (2018), probability sampling enhances objectivity by providing every member of the population with an equal opportunity of selection. A total of 43 structured questionnaires were distributed to the selected respondents. Out of these, 31 questionnaires were correctly completed and returned, representing a 72.1% response rate. This response rate is considered adequate for descriptive survey studies and provides sufficient data for reliable statistical analysis.

Instrument for Data Collection

Primary data were collected using a structured questionnaire developed specifically for this study after an extensive review of relevant literature on construction cost management, professional practice, and whole-life costing (Ashworth & Perera, 2018; Potts, 2008). The questionnaire comprised two sections. Section A collected respondents' demographic and professional information, while Section B contained questions relating to professional role imbalance, engagement of non-professional labour, construction costs, and whole-life costing.

The questionnaire consisted mainly of closed-ended questions to facilitate uniform responses and simplify statistical analysis. Before administration, the instrument was reviewed for clarity and relevance by experienced academics and construction professionals to ensure that the questions adequately addressed the objectives of the study.

Validity and Reliability of the Instrument

Content validity was established through expert review by academics in Quantity Surveying and experienced construction professionals. Their observations were incorporated into the final version of the questionnaire to improve clarity, relevance, and adequacy.

Method of Data Analysis

The completed questionnaires were coded and entered into Microsoft Excel for statistical analysis. Descriptive statistical techniques, including frequency distributions, percentages, tables, and charts, were used to summarize and present the data. The percentage for each response category was calculated using the following equation:

$$\textbf{Percentage} = \frac{\text{Frequency}}{\text{Total Number of Responses}} \times 100$$

The analyzed results were presented in tables and interpreted in relation to the objectives of the study and relevant literature. This approach enabled the identification of patterns and trends regarding the effects of non-professional labour and professional role imbalance on construction costs and whole-life costing.

4. RESULTS AND DISCUSSION

Response Rate

Table 1. Distribution and Retrieval of Questionnaires

Respondent Category	Distributed	Returned	Not Returned	Response Rate (%)
Public Sector	14	9	**5**	64.29
Contracting Firms	14	6	**2**	75.00
Consultancy Firms	13	11	**2**	84.62
Users/Clients	8	5	**3**	62.50
Total	43	31	**12**	72.09

Table 1 shows that 43 questionnaires were distributed to respondents drawn from the public sector, consultancy firms, contracting organizations, and project users. Of these, 31 questionnaires were successfully completed and returned, representing an overall response rate of 72.09%. The response rate is considered adequate for descriptive survey research and provides a reliable basis for analyzing the perceptions of construction professionals regarding the impact of non-professional labour and professional role imbalance on construction costs.

Professional Characteristics of Respondents

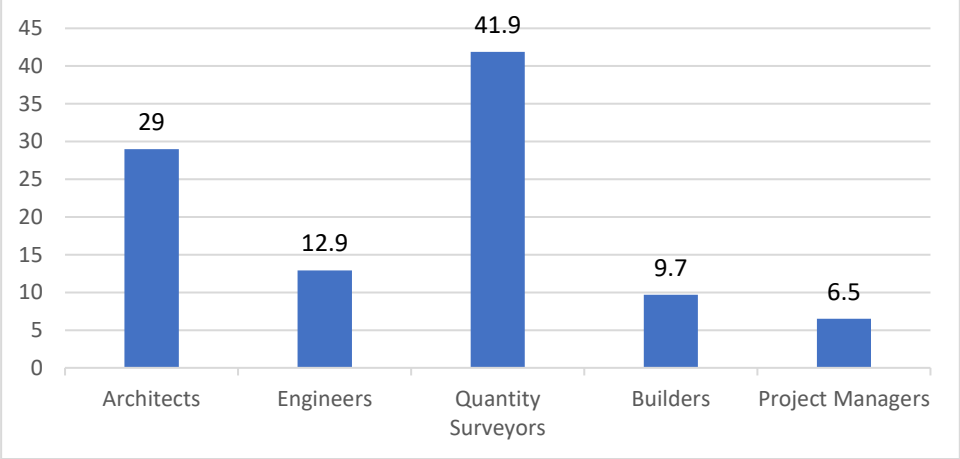

Figure 1. Histogram of the percentage of Professionals in the Sample studied

Figure 1 illustrates the distribution of respondents according to their professional backgrounds. Quantity Surveyors constituted the highest proportion of respondents (41.9%), followed by Architects (29.0%), Engineers (12.9%), Builders (9.7%), and Project Managers (6.5%). This distribution demonstrates that the study captured opinions from the major professional groups involved in construction project delivery, thereby improving the credibility of the findings.

Effect of Professional Role Imbalance on Clients' Cost Requirements

Table 2. Perceived Effect of Professional Role Imbalance on Cost-in-Use

Response	Frequency	Percentage (%)
Encouraging	6	19.35
Discouraging	13	41.94
No Effect	10	32.26
None of the Above	2	6.45
Total	31	100.00

As shown in Table 2, the largest proportion of respondents (41.94%) believed that professional role imbalance discourages effective consideration of clients' requirements relating to whole-life costing. Only 19.35% considered the imbalance beneficial, while 32.26% indicated that it had no significant effect. These findings suggest that clearly defined professional responsibilities are essential for achieving effective cost planning and ensuring that clients receive accurate advice regarding long-term project costs.

Role of Quantity Surveyors in Whole-Life Costing

Table 3. Professionals Responsible for Whole-Life Costing

Professional	Frequency	Percentage (%)
Engineers	4	12.90
Architects	1	3.23
Quantity Surveyors	26	83.87
Total	31	100.00

The results indicate that 83.87% of respondents identified Quantity Surveyors as the professionals primarily responsible for determining whole-life costs and advising clients on the financial implications of construction projects. This finding reinforces the central role of Quantity Surveyors in lifecycle cost analysis, procurement planning, cost control, and value-for-money assessment throughout the construction process.

Critical Stage for Determining Whole-Life Cost

Table 4. Stage of Project Development Critical to Whole-Life Costing

Project Stage	Frequency	Percentage (%)
Design	4	12.90
Pre-design	14	45.16
Construction	4	12.90
All Stages	9	29.03
Total	31	100.00

Almost half of the respondents (45.16%) considered the pre-design stage the most critical period for determining whole-life costs. This finding highlights the importance of early cost planning and strategic decision-making before construction begins. Appropriate design decisions made during the conceptual stage can significantly reduce maintenance costs and improve the long-term value of construction projects.

Whole-Life Costing as a Decision-Making Tool

Table 5. Whole-Life Costing and Total Project Cost

Response	Frequency	Percentage (%)
Yes	25	80.65
No	6	19.35
Total	31	100.00

The findings reveal that 80.65% of respondents agreed that whole-life costing provides a comprehensive assessment of the total cost implications of construction projects over their economic life. This supports the growing recognition of lifecycle costing as an essential decision-making tool for sustainable construction and long-term value creation.

Effect of Whole-Life Costing on Sustainable Construction

Table 6. Perceived Effect of Whole-Life Costing on Sustainability

Response	Frequency	Percentage (%)
Positive	17	54.84
Negative	5	16.13
No Effect	9	29.03

Total	31	100.00

More than half of the respondents (54.84%) agreed that the application of whole-life costing positively influences the sustainability of construction projects by encouraging decisions that reduce maintenance costs and improve long-term value for money. However, 29.03% perceived no significant effect, while 16.13% viewed the impact negatively. Overall, the findings support the integration of whole-life costing into construction planning and project management.

Discussion of Findings

The findings of this study demonstrate that the engagement of non-professional labour may reduce initial construction expenditure but significantly increases the whole-life cost of construction projects due to poor workmanship, frequent rework, material wastage, and increased maintenance requirements. These findings are consistent with Durdyev and Mbachu (2018), who reported that inadequate labour skills reduce productivity and contribute to cost overruns. More recent studies have also shown that skilled labour remains one of the most critical determinants of construction quality, project efficiency, and long-term sustainability (Aghimien et al., 2022; Windapo, 2021).

The study further established that professional role imbalance adversely affects cost planning, contract administration, and financial accountability. Construction projects require effective collaboration among Quantity Surveyors, Architects, Engineers, Builders, and Project Managers. Where qualified professionals are excluded from decision-making or their responsibilities are assumed by inadequately trained personnel, project performance deteriorates. This finding supports Ashworth and Perera (2018), who emphasized that effective cost management depends on the active participation of qualified Quantity Surveyors throughout the project lifecycle. Similarly, Love et al. (2021) argued that weak professional coordination remains a significant contributor to construction inefficiencies and cost overruns.

Another important finding is that respondents identified the pre-design stage as the most appropriate period for implementing whole-life costing. Decisions made during project conception and design have a substantial influence on maintenance costs, operational efficiency, and asset performance throughout the building's life cycle. This finding aligns with contemporary sustainable construction principles, which advocate early integration of lifecycle cost analysis into project planning to maximize value for money and reduce environmental impacts (ISO 15686-5, 2017; Aghimien et al., 2022).

Overall, the findings demonstrate that sustainable construction extends beyond minimizing initial construction costs. It requires strategic investment in qualified professionals, effective interdisciplinary collaboration, and the application of whole-life costing principles throughout project planning, design, construction, operation, and maintenance. These measures improve project performance, reduce lifecycle costs, and enhance the long-term value of construction investments.

5. CONCLUSION

This study examined the effects of non-professional labour and professional role imbalance on construction costs and whole-life costing within the Nigerian construction industry. The findings demonstrate that although employing non-professional labour may reduce initial construction costs, thereby resulting in poor workmanship, increased rework, material wastage, and higher maintenance requirements substantially increase the whole-life cost of construction projects. Consequently, the short-term financial savings associated with unskilled labour are outweighed by long-term economic losses.

The study further established that professional role imbalance adversely affects project performance by weakening cost planning, financial accountability, contract administration, and effective project coordination. The findings emphasize the

indispensable role of Quantity Surveyors in lifecycle costing, cost planning, procurement, and financial management throughout the construction process.

Overall, the study concludes that sustainable construction delivery depends on the engagement of competent professionals, clearly defined professional responsibilities, and the adoption of whole-life costing principles from the early stages of project development. These measures are essential for achieving value for money, improving project performance, and enhancing the long-term sustainability of construction projects.

Based on the findings of this study, the following recommendations are proposed:

Construction clients should ensure the active involvement of Quantity Surveyors throughout the planning, procurement, construction, and post-construction stages to strengthen cost planning, financial control, and lifecycle cost management.

Whole-life costing should be adopted as a standard decision-making tool during the pre-design stage of construction projects to facilitate informed investment decisions and optimize long-term project value.

Construction organizations should clearly define the responsibilities of all project professionals to eliminate role overlap, improve accountability, and promote effective interdisciplinary collaboration.

Government agencies and professional regulatory bodies should strengthen the enforcement of professional standards to discourage the engagement of unqualified personnel in activities requiring professional competence.

Continuous professional development programs and technical training should be encouraged for construction professionals and skilled artisans to improve productivity, workmanship, and sustainable construction practices.

Future studies should extend this research to other states in Nigeria and apply inferential statistical techniques to provide broader evidence on the relationship between professional competence, lifecycle costing, and construction project performance.

6. COMPETING INTERESTS

None to declare

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