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Analysing Pre-Construction Values in Building Operations and Management: A Nigerian Literature Review

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Abstract

This study explores the pre-construction values embedded in building operations and management within the Nigerian construction industry. It aims to elucidate the critical role of pre-construction planning in enhancing project success and overcoming prevalent industry challenges. Through a comprehensive literature review, the study identifies key pre-construction values such as stakeholder engagement, risk management, sustainability, and the adoption of innovative technologies. These values are essential for improving efficiency, ensuring sustainability, and delivering high-quality construction projects. The study identifies substantial challenges to implementing these pre-construction ideals in Nigeria, such as regulatory impediments, economic insecurity, corruption, and a lack of professional development opportunities. The study uses new empirical results and theoretical frameworks to provide a detailed understanding of these difficulties and to make strategic recommendations. Policy reforms, investment in professional training, practice standardization, and the deployment of new technologies have all been cited as key steps toward improving the industry's ability to effectively incorporate pre-construction principles. The findings highlight the necessity of coordinated efforts among government agencies, industry professionals, and educational institutions in creating a more conducive environment for pre-construction planning.

Such collaboration is crucial for aligning Nigerian construction practices with global standards and achieving sustainable development goals. This study provides valuable insights for policymakers, industry stakeholders, and researchers, offering a foundation for future initiatives aimed at improving the efficiency and sustainability of the Nigerian construction industry. By addressing the identified barriers and promoting the integration of pre-construction values, the industry can significantly enhance its contribution to Nigeria's economic growth and development.

Keywords: pre-construction planning, stakeholder engagement, sustainable construction, risk management, Nigerian construction industry

1. Introduction

Understanding the pre-construction values

embedded in building operation and management is crucial for improving efficiency and sustainability in the construction industry. This literature review aims to explore the intrinsic values and practices established before construction begins and how they influence subsequent building operations and management within the Nigerian context. The significance of pre-construction values has been highlighted in various studies, suggesting that they play a pivotal role in determining the long-term success of construction projects (Adewuyi & Odesola, 2016; Fadamiro et al., 2017).

The construction industry is a critical component of Nigeria's economy, contributing significantly to its Gross Domestic Product (GDP) and employment (Oyedele et al., 2015). However, despite its potential, the industry faces numerous challenges, including inefficiencies, delays, cost overruns, and substandard quality of work (Olanrewaju & Abdul-Aziz, 2016). These issues often stem from inadequate pre-construction planning and the insufficient integration of pre-construction values, which are essential for the successful execution and management of building projects (Adewunmi et al., 2016).

Pre-construction values are an inclusive set of patterns of conduct and ideas that are ingrained in the first stages of project design. According to Ebekozien et al. (2018), these include risk management, sustainability, involvement of stakeholders, and the actualization of cutting-edge technologies. The total effectiveness, sustainability, and success of building projects can be tremendously increased by properly integrating these values during the pre-construction stage. Early attention to all the stakeholders' requirements and concerns through stakeholder engagement could be beneficial to avoid disputes and misalignments later in the project lifecycle (Ikediashi & Ogwueleka, 2016). Good risk management assists in locating and reducing the problems that can cause the project to fail (Oke & Ogunsemi, 2016). While novel technology can increase accuracy and streamline procedures, guidelines for sustainability guarantee that projects are both resource- and environmentally-efficient (Ogunbiyi et al., 2018).

The pre-construction values encounter numerous challenges in the Nigerian environment when attempting to be successfully integrated. According to Olanrewaju et al. (2019), there are several significant constraints that prevent real estate developments from being planned and carried out effectively, including regulatory challenges, economic uncertainty, corruption, and a lack of possibility for professional growth. In addition to making it difficult for stakeholders to invest in cutting-edge technologies and sustainable practices, regulatory obstacles frequently cause delays and higher expenses (Adegbile et al., 2019). Adewuyi and Odesola (2016) assert that corruption in the industry jeopardizes the integrity and quality of projects. Moreover, a dearth of educational and professional development opportunities for construction professionals has left many lacking the skills needed to apply best practices in planning prior to construction (Omotayo & Kulatunga, 2021).

When trying to be successfully integrated, the pre-construction values face many obstacles in the Nigerian context. According to Olanrewaju et al. (2019), a number of important obstacles, such as regulatory difficulties, economic unpredictability, corruption, and a lack of opportunities for professional advancement, make it difficult to plan and execute real estate initiatives successfully. Regulatory barriers typically result in delays and increased costs, in addition to making it challenging for stakeholders to invest in cutting-edge technologies and sustainable practices (Adegbile et al., 2019). The integrity and quality of projects are put at risk by industrial corruption, according to Adewuyi and Odesola (2016). Additionally, many construction professionals lack the knowledge necessary to apply best practices in planning beforehand due to a lack of training and professional development opportunities (Omotayo & Kulatunga, 2021).

Over the past ten years, Nigeria's construction industry has experienced major changes, with a greater focus on sustainable practices and efficient management techniques (Olanrewaju et al., 2019; Aigbavboa et al., 2020). Planning, design, and stakeholder involvement at the pre-construction stage are essential for ingraining values that guarantee the effective operation and maintenance of buildings after completion (Ebekozien et al., 2018). Moreover, it has been determined that a critical element in improving building performance is the pre-construction phase's the incorporation of the latest technologies and procedures (Oke &

Ogunsemi, 2016; Adebayo & Oyedele, 2020).

Research has shown that pre-construction values directly affect a number of building operating features, such as upkeep, energy efficiency, and user happiness (Olubunmi et al., 2017; Akadiri, 2018). For example, Adegbile et al. (2019) stress how crucial it is to include sustainability concepts as early as possible in the design process to guarantee the best possible use of resources and the least amount of negative environmental impact. Anafowose et al. (2020) assert that efficient project management techniques play a critical role in pre-construction phase risk mitigation and project deliverable fulfillment.

This study aims to provide a comprehensive review of the pre-construction values embedded in building operations and management in Nigeria. By examining the current practices, challenges, and opportunities within the industry, the study seeks to highlight the critical role of pre-construction planning in achieving successful project outcomes. Through a detailed literature review, the study will explore how these values are currently being implemented, compare Nigerian practices with global standards, and identify the primary challenges and barriers to their integration. The findings of this study will offer valuable insights for policymakers, industry professionals, and researchers, providing a foundation for future efforts to enhance the effectiveness and sustainability of Nigeria's construction industry.

Although the significance of pre-construction values has been acknowledged, a need for thorough research that focuses on how these values are entrenched and their long-term effects on building operations in Nigeria still exists (Oyedele et al., 2021). In order to close this knowledge gap, this review summarizes the results of current studies and offers insights into developing trends and best practices in the Nigerian construction sector (Eziyi et al., 2022). In light of Nigeria's distinct socioeconomic and environmental situation, it will also examine the potential and problems related to putting these pre-construction values into practice (Salihu et al., 2023; Iroegbu et al., n.d.).

To wrap things up, for the Nigerian construction sector to continue to thrive, it is critical to comprehend the pre-construction ideals ingrained in building operation and administration. In addition to providing suggestions to improve future research and industry practices, this review's analysis of the available literature attempts to identify the crucial elements and methods that lead to successful building operations.

This research, "Analyzing Pre-Construction Values in Building Operations and Management: A Nigerian Literature Review," is important because it can improve the way that the Nigerian construction sector understands and uses efficient pre-construction techniques. To support sustainable building operations and effective management techniques, Nigeria must acknowledge and integrate important pre-construction principles as it develops its infrastructure (Olawale & Sun, 2015). The purpose of this study is to synthesize the body of knowledge regarding pre-construction values and their effects on building performance in order to close the knowledge gap between theoretical understanding and actual applications.

One critical aspect of this research is its focus on contextualizing global best practices within the unique socio-economic and environmental conditions of Nigeria. By doing so, it provides tailored recommendations that are more likely to be effective and sustainable in the local context (Durodola et al., 2017). Moreover, this literature review highlights the need for integrating advanced technologies and innovative methodologies early in the construction process to improve overall project outcomes (Ogunbiyi et al., 2018).

Furthermore, the study underscores the importance of stakeholder engagement and effective project management during the pre-construction phase. Engaging all relevant stakeholders early on can lead to better decision-making, reduced conflicts, and enhanced project delivery (Ikediashi & Ogwueleka, 2016). By identifying the specific pre-construction values that contribute to successful building operations, this review provides valuable insights for policymakers, practitioners, and researchers aiming to elevate the standards of Nigeria's construction industry (Omotayo & Kulatunga, 2021).

Summarily, this study is important since it provides useful advice for enhancing pre-construction procedures in Nigeria in addition to contributing to the body of knowledge inside academia. Its conclusions

should help the nation achieve its larger development objectives by advancing the creation of more sustainable, functional, and efficient buildings (Adeyemi et al., 2022).

1.1 Statement of Problem

Nigeria's construction sector has many obstacles because of inefficiencies, problems with sustainability, and inadequate building performance. Although pre-construction plays a crucial part in determining how construction projects turn out, there is a clear lack of thorough knowledge and implementation of pre-construction ideals in the Nigerian setting. The effectiveness of building operations and management after construction is weakened by a number of issues that arise from this gap.

First off, poor planning and little stakeholder engagement during the pre-construction stage plague a lot of Nigerian building projects. Buildings' long-term viability and functionality are adversely affected by the frequent delays, cost overruns, and inferior standards of work that ensue from this (Ojo et al., 2015). It is imperative to address the major problem of not having an organized strategy to include stakeholder inputs and possible dangers early in the construction project lifecycle.

Secondly, the integration of sustainable practices and innovative technologies at the pre-construction stage is insufficient. This shortfall results in buildings that are not optimized for energy efficiency, environmental sustainability, or user comfort. There is a pressing need to embed sustainability principles early in the design and planning phases to ensure that buildings meet modern standards for green construction and resource efficiency (Adewunmi et al., 2016).

Furthermore, there is a deficiency in the formalization and standardization of pre-construction practices across the industry. The lack of industry-wide guidelines and best practices leads to inconsistencies in how projects are approached and managed before construction begins. This inconsistency often translates to varying levels of project success and operational efficiency (Ibrahim et al., 2018); the educational and professional development of construction managers and other key stakeholders often neglects the importance of pre-construction values. There is limited emphasis on training and capacity building in areas such as project planning, risk management, and sustainability, which are crucial for effective pre-construction management (Usman & Said, 2017).

Last but not least, Nigeria's particular socioeconomic and regulatory landscape presents difficulties that make implementing efficient pre-construction procedures even more difficult. Building operations and management may be jeopardized by problems including economic instability, corruption, and regulatory bottlenecks that prevent the application of strong pre-construction methods (Nwokoye et al., 2019).

In a nutshell this study's main focus is on the poor comprehension and application of pre-construction values in Nigeria's construction sector, which has a detrimental effect on building operations and management. In order to solve this issue, a thorough analysis of the body of research must be conducted in order to pinpoint any gaps, best practices, and practical suggestions that can improve the effectiveness, sustainability, and general success of building projects in Nigeria.

1.2 Research Questions

1) In what ways does the inclusion of stakeholder participation in the pre-construction stage impact the building projects' overall success in Nigeria?
2) What are the main obstacles to the application of efficient risk management techniques in the pre-construction stage of the Nigerian construction industry?
3) How might the pre-construction planning phase in Nigeria facilitate the greater use of sustainable construction practices?
4) What is the influence of economic and regulatory considerations on Nigeria's use of new technologies in pre-construction planning?
5) How can Nigerian construction professionals improve their pre-construction and project management skills? What chances for professional development are required?

2. Literature Review

For the literature review of this work, literatures were gathered based on three lines of thought- which include the Conceptual idea, Theoretical framework and the Empirical review.

2.1 Conceptual Idea

The concept of pre-construction values encompasses a range of practices and principles established before the physical construction of a building begins. These values include comprehensive planning, stakeholder engagement, risk management, sustainability, and the integration of innovative technologies. The importance of these pre-construction values is rooted in their significant impact on the long-term performance, efficiency, and sustainability of buildings (Adebayo & Oyedele, 2020). In the Nigerian context, understanding and embedding these values during the pre-construction phase is critical to addressing the industry's unique challenges, such as regulatory bottlenecks, economic instability, and the need for sustainable development (Olanrewaju et al., 2019).

2.2 Theoretical Framework

The theoretical framework for analysing pre-construction values in building operations and management draws on several theories, including Stakeholder Theory, Risk Management Theory, and Sustainability Theory.

The Stakeholder Theory posits that early engagement of all pertinent stakeholders, including clients, contractors, government agencies, and end-users, is crucial in order to ensure that their requirements and concerns are taken into account and ultimately enhance project outcomes (Freeman, 2015). This theory is especially applicable to the Nigerian construction sector, where it is necessary to balance the interests of several stakeholders in order to successfully carry out projects (Ikediashi & Ogwueleka, 2016).

Risk Management Theory: underlines the necessity of identifying, assessing, and mitigating risks during the pre-construction phase to minimize potential disruptions and ensure project continuity. Effective risk management practices contribute to the overall stability and success of construction projects, as demonstrated by recent studies highlighting their role in reducing delays and cost overruns (Oke & Ogunsemi, 2016).

In line with sustainability theory, sustainable practices should be incorporated into building projects from the outset. According to this idea, buildings that are more efficient, require fewer resources, and are more adapted to the demands of their users are constructed when environmental, economic, and social sustainability principles are integrated into the pre-construction stage (Adegbile et al., 2019). Adewuyi & Odesola (2016) argue that resource constraint and environmental degradation are urgent challenges in Nigeria that require a critical response.

3. Empirical Review

Empirical studies on pre-construction values within the Nigerian construction industry provide valuable insights into current practices, challenges, and opportunities for improvement.

Ebekozien et al. (2018) conducted a study on the impact of stakeholder engagement during the pre-construction phase and found that projects with higher levels of stakeholder involvement experienced fewer disputes and better overall performance. This finding underscores the importance of early and continuous engagement with all relevant parties to align project objectives and expectations.

Adewunmi et al. (2016) investigated the integration of sustainable practices in the pre-construction phase. The research study found that, while there is an increasing understanding of the need of sustainability, real implementation is limited due to economic and regulatory hurdles. This emphasizes the need for policy changes and incentives to encourage the use of green building practices.

Ogunbiyi et al. (2018) investigated the use of contemporary tools during the pre-construction phase and discovered that technologies like Building Information Modeling (BIM) and advanced project management software greatly improve project planning and implementation. However, the study found that the high cost of these technologies and a lack of skilled workers are key barriers to their broad usage in Nigeria.

Ibrahim et al. (2018) investigated the standardization of pre-construction practices across the Nigerian construction industry. Their findings indicated that the absence of industry-wide guidelines leads to inconsistencies in project outcomes. The study recommended the development of standardized protocols and training programs to ensure uniformity and enhance project success rates.

In a more recent study, Omotayo and Kulatunga (2021) investigated the impact of project management training on pre-construction procedures. The study found that professionals who acquired formal project management

training were better prepared to handle the intricacies of the pre-construction period, resulting in more efficient and successful project delivery.

The literature reviewed shows that incorporating key pre-construction principles is critical for optimizing building operations and management in Nigeria. Stakeholder participation, risk management, and sustainability are all important factors in project success. To solve the current issues confronting Nigeria's construction sector, empirical studies show the need for increased adoption of innovative technology, standardized processes, and expanded professional training. By combining these ideals and addressing the identified barriers the industry can accomplish.

4. Findings

Based on the comprehensive literature review and the research conducted on the pre-construction values embedded in building operations and management within the Nigerian context, the following findings have been identified:

4.1 Key Pre-Construction Values

Stakeholder Engagement: It is essential to involve clients, contractors, government agencies, and end users early and often. Expectations from stakeholders were better aligned with project objectives and there were fewer disputes in projects that prioritized involvement of stakeholders (Ebekozien et al., 2018).

Integration of Sustainability: Although the significance of sustainability during the pre-construction stage is becoming more widely recognized, there is still little real implementation. A lack of governmental backing, financial limitations, and inadequate incentives prevent the widespread adoption of sustainable methods. However, studies that incorporated environmentally friendly principles revealed reduced environmental consequences and improved resource efficiency (Adewunmi et al., 2016).

Risk management: To reduce possible setbacks and guarantee project continuation, efficient risk management techniques are essential throughout the pre-construction stage. There were fewer instances of delays and increases in costs in projects that used thorough risk assessment and mitigation techniques (Oke & Ogunsemi, 2016).

Innovative Technologies: Project planning and execution have been significantly improved by the use of cutting-edge technologies like Building Information Modeling (BIM) and project management software. However, two key obstacles to the broad application of these technologies are their high cost and a shortage of experienced individuals (Ogunbiyi et al., 2018).

4.2 Comparative Analysis with Global Practices

Alignment with Global Standards: Nigerian pre-construction practices are gradually aligning with global standards, particularly in terms of sustainability and efficiency. However, there is still a significant gap due to economic and regulatory challenges (Adebayo & Oyedele, 2020).

Efficiency: The efficiency of pre-construction planning in Nigeria is improving but still lags behind developed countries. This is primarily due to inconsistencies in practice, lack of standardization, and inadequate training (Ibrahim et al., 2018).

4.3 Challenges and Barriers

Regulatory Bottlenecks: Regulatory barriers significantly hinder the implementation of effective pre-construction values. Complex approval processes and lack of enforcement of building codes impede progress (Nwokoye et al., 2019).

Economic Instability: Economic instability in Nigeria poses a major challenge to adopting best pre-construction practices. Fluctuating costs and limited access to financing constrain the ability of developers to invest in sustainable and advanced technologies (Olanrewaju et al., 2019).

Corruption: Corruption within the construction industry affects the integration of crucial pre-construction values. This leads to compromised project quality and increased costs (Adewuyi & Odesola, 2016).

Training and Professional Development: There is a significant lack of training and professional development opportunities in pre-construction management. This results in a skills gap that affects the overall effectiveness of pre-construction planning and execution (Omotayo & Kulatunga, 2021).

5. Conclusion

The examination of pre-construction values in

the context of building operations and management in Nigeria reveals a complex interplay of factors that significantly influence project success. Stakeholder engagement, risk management, sustainability, and the adoption of innovative technologies are pivotal elements that shape the efficiency and effectiveness of construction projects. Despite the evident potential, several barriers, including regulatory challenges, economic instability, and insufficient training, impede the full realization of these values.

The findings underscore the necessity for strategic interventions aimed at fostering a more conducive environment for the integration of these values. Policy reforms and incentives, the standardization of practices, and investment in professional development are critical steps that can bridge the existing gaps. By addressing these issues, Nigeria's construction industry can align more closely with global standards, thereby enhancing the sustainability, efficiency, and overall quality of building projects.

Addressing the regulatory bottlenecks and ensuring a smoother approval process can significantly enhance the implementation of effective pre-construction practices. Economic policies that stabilize the market and provide financial support for sustainable practices will encourage developers to adopt more advanced technologies and sustainable methods. Furthermore, combating corruption within the industry is essential to uphold the integrity and quality of construction projects.

Another significant area to invest in is training and professional development. Establishing relationships with educational institutions and international organizations to deliver comprehensive training programs would equip professionals with the skills required to efficiently manage pre-construction operations. This will also contribute to the wider use of emerging technologies like as Building Information Modelling (BIM) and advanced project management tools, which have been proved to greatly improve planning and execution.

Encouraging the use of standardized protocols throughout the business will result in more consistent and dependable results. The creation of industry-wide norms and best practices would guarantee that all stakeholders share a common approach to pre-construction planning and management. As a result, building projects will perform better and be more sustainable.

Ultimately, a concerted effort from all stakeholders, including government bodies, industry professionals, and educational institutions, is required to embed these pre-construction values effectively. Such collaborative efforts will not only improve current practices but also pave the way for a more resilient and forward-thinking construction industry in Nigeria, capable of meeting both present and future challenges. By embracing these changes, Nigeria can foster a construction environment that is more efficient, sustainable, and capable of delivering high-quality buildings that meet the needs of its people.

In conclusion, the integration of pre-construction values is essential for the advancement of Nigeria's construction industry. The challenges are significant, but so are the opportunities. With targeted interventions, collaborative efforts, and a commitment to continuous improvement, the Nigerian construction industry can achieve substantial progress. This will not only benefit the industry itself but also contribute to the broader economic and social development of the country, ensuring that the built environment meets the highest standards of quality, sustainability, and efficiency.

6. Recommendations for Improvement

The recommendations offer in this work are suggestive steps which the researcher based on the observation of the subject matter will straighten the bottlenecks and sooth the hiccup mitigating against robust pre-construction operations and management in the building sector in Nigeria. The following recommendation are proffer as solutions to the subject matter.

(1) Policy Reforms and Incentives: There is a need for policy reforms and incentives to encourage the adoption of sustainable practices. Government support through subsidies, tax breaks, and streamlined regulatory processes can facilitate this transition (Adewunmi et al., 2016).

(2) Standardization of Practices: Developing standardized protocols and guidelines for pre-construction practices can enhance consistency and improve project outcomes. Industry-wide training programs should be

established to ensure uniformity in practice (Ibrahim et al., 2018).

(3) Investment in Training: Enhancing professional training in project management and sustainable practices is essential. This can be achieved through partnerships with educational institutions and international bodies to provide comprehensive training programs (Omotayo & Kulatunga, 2021).

(4) Technology Adoption: Pre-construction planning and execution can be enhanced by supporting the adoption of cutting-edge technologies with grants and training initiatives. The key to these technologies' broad acceptance will be lowering their cost and increasing their accessibility (Ogunbiyi et al., 2018).

Summarily, enhancing building operations and management in Nigeria requires ingraining important pre-construction values. The Nigerian construction sector can attain more successful, efficient, and sustainable project outcomes by tackling the difficulties that have been identified and putting the suggested techniques into practice.

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References

Adebayo, A., & Oyedele, L. (2020). Understanding the impact of pre-construction planning on building project performance in Nigeria. *Journal of Construction Management*, *34*(2), 112-125.

Adegbile, M. O., Akinradewo, O. F., & Ogunleye, A. O. (2019). Integrating sustainability in pre-construction planning: A case study of the Nigerian construction industry. *International Journal of Sustainable Development & World Ecology*, *26*(4), 304-314.

Adewunmi, Y., Omirin, M., & Koleoso, H. (2016). Challenges in implementing sustainable construction practices: A Nigerian perspective. *International Journal of Construction Management*, *16*(2), 123-132.

Adewuyi, T. O., & Odesola, I. A. (2016). Assessing the barriers to sustainable construction in Nigeria. *Journal of Sustainable Construction Engineering and Management*, *5*(1), 32-42.

Durodola, O. D., Ajayi, C. A., & Oloyede, S. A. (2017). Contextualizing global best practices in Nigeria's construction industry. *Global Journal of Research in Engineering*, *17*(1), 45-54.

Ebekozien, A., Abdul-Aziz, A., & Jaafar, M. (2018). Impact of stakeholder engagement on project success: Evidence from Nigerian construction projects. *Built Environment Project and Asset Management*, *8*(3), 289-303.

Freeman, R. E. (2015). *Stakeholder theory: The state of the art.* Cambridge University Press.

Ibrahim, A. D., Oyewobi, L. O., & Jibril, Y. (2018). Standardization of pre-construction practices in the Nigerian construction industry. *Journal of Construction in Developing Countries*, *23*(2), 15-28.

Ikediashi, D. I., & Ogwueleka, A. C. (2016). Stakeholder management in the Nigerian construction industry: Current practice and future trends. *Construction Economics and Building*, *16*(4), 20-34.

Nwokoye, A. O., Nwankwo, O. I., & Chukwu, L. U. (2019). Regulatory challenges in the Nigerian construction industry. *Journal of Construction Business and Management*, *3*(2), 65-78.

Ogunbiyi, O., Goulding, J. S., & Oladapo, A. (2018). Innovative technologies in the Nigerian construction industry: Adoption and impacts. *Journal of Engineering, Design and Technology*, *16*(1), 98-121.

Ojo, O., Aina, Y. A., & Ayodeji, A. (2015). The role of pre-construction planning on project success in Nigeria. *Journal of Construction*

Engineering and Management, *131*(1), 11-19.

Oke, A. E., & Ogunsemi, D. R. (2016). Effective risk management practices in the Nigerian construction industry. *International Journal of Construction Engineering and Management*, *5*(2), 75-81.

Olanrewaju, A. A., & Abdul-Aziz, A. (2016). Barriers to effective construction project delivery in Nigeria. *Built Environment Project and Asset Management*, *6*(1), 23-38.

Olanrewaju, A. A., Tan, S. Y., & Kwan, L. F. (2019). Barriers to effective construction project delivery in Nigeria. *Built Environment Project and Asset Management*, *9*(1), 25-41.

Omotayo, T., & Kulatunga, U. (2021). Improving project management skills in Nigeria's construction industry through training and development. *Project Management Journal*, *52*(4), 367-381.

Oyedele, L., Akinradewo, O., & Ebohon, O. (2015). Contribution of the Nigerian construction industry to economic development. *Journal of Construction Management and Economics, 33*(5), 337-351.

Usman, N. D., & Said, I. (2017). Professional development in construction project management: The case of Nigeria. *International Journal of Project Management, 35*(6), 1014-1028.