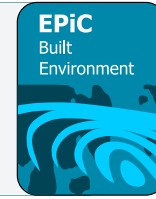




EPiC Series in Built Environment

Volume 7, 2026, Pages 901–910

Proceedings of Associated Schools of Construction 62nd Annual International Conference



Evaluating the Effect of the Supervisor’s Role in Project Implementation

Modupe Cecilia Mewomo¹, Haruna Domanamwin Abudu², Kofi Owusu Adjei³, Francis Kwesi Bondinuba⁴ and Sherif Issahaque⁵

¹Tarleton State University, ²Durban University of Technology, ³University of Johannesburg, ⁴Kumasi Technical University, ⁵Simon Diedong University of Business and Integrated Development Studies

Effective supervision is crucial for successful project execution, yet many construction projects encounter delays, cost overruns, and quality problems due to inadequate supervisory practices. Limited empirical evidence exists on which specific supervisory roles and competencies most influence project success. This study explores the impact of supervisory roles on project implementation and identifies key supervisory factors shaping overall effectiveness. A quantitative approach was used to assess supervision and project delivery in Kumasi, a major metropolitan city in Ghana. Data were collected through structured questionnaires from 235 construction professionals employing stratified, purposive, and convenience sampling. Descriptive statistics and Structural Equation Modelling (SEM) were employed, adhering to ethical standards. Results revealed five essential supervisory competencies: quality control vigilance, problem-solving and decision-making, motivational engagement, supervisory transparency, and effective communication. Exploratory Factor Analysis identified four supervisory dimensions explaining 69.8% of the total variance: Management and Motivation, Technical and Operational Competence, Leadership and Vision, and Accountability and Ethics. These findings demonstrate that effective supervision depends on both technical skills and leadership behaviors. Although focused on Ghana’s construction sector, the study offers a framework for targeted training, recruitment, and performance evaluation. Enhancing these competencies can improve project efficiency, quality, and stakeholder trust, fostering sustainable infrastructure and socio-economic development.

Keywords: Construction; Competence; Project; Project delivery; Project supervision; Supervisory roles.

Introduction

In the ever-evolving field of construction project management, the supervisor’s role is central to the effective implementation and successful delivery of projects (Almashhour et al., 2024). Globally, the construction industry faces persistent challenges such as cost overruns, delays, unsafe work environments, and substandard output, many of which can be traced back to deficiencies in site supervision, coordination, and oversight (Abdelalim et al., 2024). As infrastructure development continues to rise worldwide, especially in response to urbanisation and population growth, the demand for professional, skilled, and responsive supervisory practices has become more urgent (Lufumpa and Yepes 2017).

In Africa, where the construction sector is a key driver of socio-economic development, the lack of adequate supervision has been linked to recurring project failures, including the collapse of buildings, misappropriation of materials, and failure to meet performance benchmarks (Bucha 2021). Within Ghana, these challenges are further magnified due to systemic inefficiencies such as the use of substandard materials, poor coordination among project stakeholders, and the limited technical capacity of supervisory personnel (Kwafo 2021). Urban centres continue to witness construction delays and building defects, undermining public trust and economic growth (Bello et al., 2024).

The infamous collapse of the buildings in Ghana underscores the dire consequences of poor site supervision and weak regulatory enforcement (Boateng 2024). While several studies have examined the general factors affecting construction quality in developing countries, there remains a notable research gap in understanding the specific role and effectiveness of supervisors in actual project implementation, particularly in the Ghanaian context. The conventional construction methods still widely practised by indigenous firms in Ghana (Somiah et al., 2022) require meticulous supervision, yet little research has focused on how supervisory practices directly impact project outcomes such as quality, time, safety, and cost.

It is against this background that the present study seeks to evaluate the effect of the supervisor's role in project implementation, using Kumasi, a major metropolitan city in Ghana, as a focal point. The purpose of the study is to explore how site supervision practices ranging from planning and coordination to monitoring and workforce management influence the successful delivery of construction projects. The need for this study lies in addressing the limited empirical data on supervisory effectiveness in Ghana's construction sector, providing insights for contractors, consultants, and policymakers on best practices to improve supervision and reduce project failure. The overarching aim of the study is to assess the impact of supervisory roles on project delivery, while its specific objective is to identify the key supervisory practices adopted in the Ghanaian construction industry to ensure successful project delivery.

Literature Review

Project supervision is widely recognised as a critical determinant of successful project implementation across both developing and developed economies. In Ghana, project supervision is increasingly recognised as essential for successful project delivery, yet it remains underdeveloped in practice (Amponsah, 2024). Ineffective supervision has been linked to high project costs, delays, and even abandonment. Studies by Judson and Paul (2022) and Ogundipe et al. (2018) highlight systemic issues such as poor supervision, delayed payments, cost underestimations, and limited recognition of supervision's role in achieving quality outcomes. Similar challenges have been documented in other developing economies, where weak supervisory frameworks undermine project performance and sustainability.

In contrast, evidence from Europe and the United States suggests that strong supervisory systems are often embedded within formal project governance and regulatory frameworks. For example, studies in the United Kingdom and Germany indicate that clearly defined supervisory roles, professional certification, and continuous training significantly improve project quality and schedule performance (Turner, 2014; Müller & Lecoivre, 2014). In the United States, the Project Management Institute (Aydın 2025; Chadee et al., 2025; Astagina & Raharjo, 2025) reports that effective site supervision and leadership accountability contribute to reduced rework, improved safety performance, and enhanced stakeholder satisfaction. These international benchmarks highlight the gap between Ghanaian practice and global standards, reinforcing the need for strengthened supervisory mechanisms.

In many Ghanaian firms, formal policies to strengthen supervisory systems are lacking, despite mounting evidence that supervision has a direct impact on project quality and efficiency. Famiyeh et al. (2017) argue that poor planning and weak communication by supervisors contribute to low-quality work. Additionally, Ghafoor et al. (2025) identified discrepancies between design and execution as a recurring challenge, worsened by inadequate on-site oversight. Comparable studies in Europe show that such discrepancies are mitigated through structured supervision protocols, digital monitoring tools, and integrated project delivery systems (Love, 2025; Bryde et al., 2018).

Several factors affect the effectiveness of site supervision, including technical knowledge, communication skills, management support, and site layout planning (Abdul-Fatawu et al., 2024). Fitch et al. (2014) emphasise that good supervision enhances team performance and prevents unethical behaviours like theft, negligence, or falsification of records. Supervisors who certify construction phases and ensure compliance with approved designs, as suggested by Hudson et al. (2021), help guarantee quality outputs. In Europe and the USA, supervisory effectiveness is further reinforced through performance-based evaluation systems and safety compliance audits, which strengthen accountability and transparency (Zidane & Andersen, 2018; Aydın, 2025; Chadee et al., 2025; Astagina & Raharjo, 2025). Loyalty and motivation among workers also increase when they perceive supervision as fair and purposeful (Ashraf, 2019), a finding consistent with studies in Scandinavian countries, where participatory supervision has been shown to improve workforce engagement and productivity (Nielsen & Daniels, 2012).

Supervision is broadly defined as the coordination and direction of site activities to ensure safety, efficiency, and adherence to specifications (Heydari et al., 2024). It is seen as a critical management function that drives planning, organising, and execution. Abdurezake et al. (2025) support this by highlighting how high-performance supervision practices, such as proper recruitment, training, and delegation, improve worker retention and project outcomes. These findings align with evidence from the United States, where leadership-focused supervision models emphasise coaching, empowerment, and continuous improvement as drivers of project success (Kerzner et al., 2022).

Heydari et al. (2024) also view supervision as a problem-solving tool, vital in ensuring artisans do not cut corners. Delegation, as noted by Walter (2018), fosters employee development and commitment, further reinforcing the link between effective supervision and project success. In European construction projects, delegation is often supported by clearly defined role descriptions and competency frameworks, which reduce ambiguity and enhance coordination (Müller & Lecoeuvre, 2014).

Quality delivery remains the ultimate goal of construction supervision. According to Ogundipe et al. (2018), quality supervision reduces rework, minimises waste, and improves cost control. Olawale (2024) emphasises that contractors' reputations for quality are increasingly based on their supervision capabilities. Similarly, Bazrkar et al. (2017) argue that total quality supervision enhances client satisfaction and organisational performance by aligning project objectives with stakeholder expectations. Comparable conclusions have been drawn in studies from the USA and Western Europe, where quality-driven supervision is directly linked to competitive advantage and long-term organisational performance (Love, 2025; Kerzner et al., 2022).

Supervision plays a crucial role in ensuring the effective implementation of projects, particularly in the construction sector. Heydari et al. (2024) describe supervision as a collaborative tool essential for resolving on-site challenges and delivering quality outcomes. Abdul-Fatawu et al. (2024) link worker productivity directly to the effectiveness of their supervisors, while Heydari et al. (2024) argue that supervision must be integrated into broader management practices for optimal results in Ghana's

construction industry. This integration mirrors practices in Europe and the USA, where supervision is embedded within holistic project management systems rather than treated as a standalone function (Turner, 2014; Aydın, 2025; Chadee et al., 2025; Astagina & Raharjo, 2025).

Similarly, Ashraf (2019) emphasises the importance of team motivation, communication, and coordination as core supervisory tasks that significantly impact project outcomes. Effective supervision goes beyond monitoring; it involves leadership that influences project quality, safety, and team performance (Heydari et al., 2024). Supervisors are central to enforcing quality standards, minimising errors, and ensuring compliance (Walter, 2018). Their problem-solving abilities and real-time decision-making skills are crucial in navigating project uncertainties, such as material delays or labour shortages (Tengan et al., 2019; Mjakuškina et al., 2019; Ogundipe et al., 2018). These competencies are equally emphasised in international literature, where adaptive supervision is viewed as essential in complex and dynamic project environments (Zidane & Andersen, 2018).

Additionally, supervisors act as motivators, engaging workers through feedback, recognition, and morale-boosting activities that increase productivity and reduce turnover (Heydari et al., 2024). Communication competence is equally crucial; clear, two-way communication enhances trust, resolves issues efficiently, and promotes team alignment (Fitch et al., 2014). Accountability and task delegation are also vital. Supervisors who distribute tasks based on team strengths and set measurable targets drive both efficiency and ownership (Abdurezake et al., 2025).

In modern construction environments, innovation, adaptability, and support for learning and development further enhance supervisory effectiveness (Li, 2024). Supervisors must also manage multiple crews and coordinate resources efficiently to avoid delays and conflicts (Kanki, 2019). Facilitating cross-team collaboration ensures that all project units work toward shared goals. Overall, while Ghana's construction industry continues to face supervisory challenges, lessons from Europe and the USA provide valuable benchmarks for improving supervisory practices and strengthening project implementation outcomes. The supervisor's multifaceted role, spanning quality assurance, leadership, communication, and innovation, remains fundamental to the successful implementation of projects across diverse contexts.

Methodology

This study adopted a quantitative research approach to investigate the influence of the supervisor's role on project implementation. Data were gathered through structured questionnaires, which enabled the effective collection and analysis of participants' perspectives. According to Fellows and Liu (2015), the quantitative method aligns with a positivist paradigm, aiming to collect objective data, explore relationships between variables, and connect findings to existing theories and previous research. This approach ensures that reliable, measurable data are obtained to test hypotheses, support informed decision-making, and draw valid conclusions.

The research focused on construction professionals operating within the Kumasi Metropolitan Area in Ghana's Ashanti Region, one of the country's fastest-growing areas. Kumasi was selected due to its active infrastructure development, making it a suitable case for evaluating supervisory practices with potential applicability in other regions.

A combination of probability and non-probability sampling techniques was employed. Stratified sampling was used to group respondents based on shared characteristics, while purposive and convenience sampling helped to reach professionals directly involved in construction supervision. Out of 300 questionnaires distributed, 235 were completed and returned, resulting in a response rate of

78.3%. The survey targeted key construction professionals, including clerks of works, site engineers, site supervisors, and site foremen, all of whom have practical experience in supervising and implementing projects. “Clerks of Work” is a British/Commonwealth term used in Ghana, and it is functionally equivalent to the U.S. roles of Owner’s Site Representative, Inspector, or Construction Administrator. The questionnaire items were rated using a 5-point Likert scale, ranging from “Strongly Disagree” to “Strongly Agree,” to assess the perceived impact of supervisory roles on project execution.

Data were analysed using both descriptive and inferential statistics. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarise participant demographics and their views on supervisory practices. The analyses were performed using SPSS (Version 25). The research was conducted in accordance with ethical guidelines involving human subjects. Informed consent was obtained from all participants, and their confidentiality was fully protected. Responses were anonymised to maintain privacy, and participants were informed of their right to voluntarily withdraw from the study at any point without any negative consequences.

Results and Discussion

Background Characteristics

This section summarises the demographic profile of the respondents as shown in Table 1. The background characteristics revealed that a greater percentage of the participants were males, representing 88.1 percent. A relative majority of the participants were in the position of site engineer, representing 42.6%, followed by 37.9% were site managers, 10.6% were site foremen, and the remaining were clerks of works.

The highest level of participants' academic qualification was a Bachelor’s degree, representing 49.8%. The participants with a master’s degree represent 17.0% of the participants. There is also a significant number of participants with the Highest National Diploma, representing 26.8%.

From Table 1, the number of years participants had been operating in the construction industry revealed a relatively even distribution.

Table 1: Background Information

	Frequency	Percent
Gender		
Male	207	88.1
Female	28	11.9
Total	235	100
Position	-	
Site foreman	25	10.6
Site manager	89	37.9
Site engineer	100	42.6
Clerk of works	21	8.9
Total	235	100
Highest level of academic qualification	-	
Certificate	11	4.7
Highest National Diploma	63	26.8
Bachelor’s degree	117	49.8
Masters	40	17.0
PhD	4	1.7
Total	235	100
Number of years operated in the construction industry	-	

Less than 6 years	24	10.2
6-10 years	81	34.5
11-15 years	81	34.5
Over 15 years	49	20.9
Total	235	100

Source: Field survey 2025.

Descriptive Statistics of Supervision Role

From the results, the mean scores ranged from 4.37 to 3.84, with respective deviations relatively low for the majority. The first five indicators were rated high with mean scores from 4.37 to 4.17 and standard deviation < 1.00, indicating high consistency of response. The normalisation values considered critical indicators were the first five, recording the values ranged from 1.00 to 0.611. These critical indicators are identified as the most common supervision role indicators: quality control vigilance, problem-solving and decision-making ability, motivational engagement, supervisory transparency and effective communication competence, as shown in Table 2.

Table 2: Descriptive Statistics of Supervision Role

	Mea n	Std. Deviation	NV	Rankin g
Quality Control Vigilance	4.37	0.894	1.000**	1
Problem-Solving and Decision-Making Ability	4.30	0.841	0.865**	2
Motivational Engagement	4.23	0.918	0.722**	3
Supervisory Transparency	4.17	0.842	0.627**	4
Effective Communication Competence	4.17	0.926	0.611**	5
Accountability and Recognition	4.15	0.758	0.587	6
Goal Orientation and Prioritisation	4.13	0.855	0.548	7
Accountability Enforcement	4.13	1.054	0.540	8
Delegation and Task Distribution Skill	4.08	0.905	0.452	9
Practical Target-Setting Competence	4.08	0.778	0.452	10
Innovation Encouragement	4.05	1.085	0.397	11
Adaptability and Resilience	4.03	0.821	0.349	12
Team Collaboration Facilitation	3.97	0.967	0.246	13
Learning and Development Support	3.95	0.979	0.214	14
Resource Coordination Skills	3.93	1.107	0.175	15
Multi-Crew Oversight Capability	3.92	0.960	0.151	16
Supervisory Multitasking Competence	3.92	1.003	0.151	17
Two-Way Communication	3.84	1.124	0.000	18

**** Normalised Values critical**

Source: Field survey 2025.

Discussion of Supervision Role

The role of supervision is undeniably pivotal in achieving successful project implementation. This study identified five supervisory competencies that demonstrated the strongest influence on effective project delivery: quality control vigilance, problem-solving and decision-making ability, motivational engagement, supervisory transparency, and effective communication competence. Each of these elements plays a distinct yet complementary role in strengthening the relationship between supervision and overall project performance.

Quality control vigilance emerged as the most significant component, receiving the highest mean score ($M = 4.37$) and the top normalised value ($NV = 1.000$). This highlights the importance of a supervisor's ability to consistently uphold quality standards throughout the execution phase. Empirical research affirms that meticulous quality oversight is a major determinant of project success. Supervisors who rigorously enforce quality benchmarks are more likely to prevent errors, reduce costly rework, and sustain client satisfaction (Heydari et al., 2024). According to Abdul-Fatawu et al. (2024), close monitoring of project deliverables against established specifications is vital for maintaining control. Furthermore, a proactive approach to quality management encourages a culture of continuous improvement and accountability, which directly enhances project outcomes (Ashraf, 2019).

Problem-solving and decision-making ability, ranking second ($M = 4.30$; $NV = 0.865$), underscores the critical thinking skills required to navigate complex or unforeseen challenges. In dynamic project environments, the capacity to make timely and well-informed decisions is essential. Studies by Tengan et al. (2019), Mjakuškina et al. (2019), and Ogundipe et al. (2018) emphasise that this competence distinguishes successful supervisors, particularly under pressure or when managing large-scale operations. Heydari et al. (2024) further assert that decision-making under uncertainty is a defining trait of effective leadership. Such skills enable supervisors to maintain momentum and minimise the risk of escalation when issues arise.

Motivational engagement ($M = 4.23$; $NV = 0.722$) reflects the supervisor's capacity to inspire, energise, and maintain team morale. This competency goes beyond basic encouragement; it encompasses the ability to foster a supportive work environment, recognise individual and team efforts, and promote a shared commitment to project goals. The literature supports that motivated teams are generally more productive, innovative, and aligned with organisational objectives (Heydari et al., 2024). Motivation, when strategically applied by supervisors, helps sustain focus, mitigate stress, and promote resilience, particularly during high-pressure phases (Abdurezake et al., 2025). Engaged leadership also strengthens team trust and cohesion, both of which are essential for consistent project performance.

Supervisory transparency ($M = 4.17$; $NV = 0.627$) concerns the degree to which supervisors are open about project decisions, goals, and challenges. Transparent communication builds trust among team members and ensures alignment between individual responsibilities and broader project objectives. Research by Sumner and Slattery (2010) indicates that transparency fosters psychological safety and supports better team decision-making. Abdurezake et al. (2025) further note that when supervisors are clear and forthcoming, they boost stakeholder confidence and coordination efficiency. Transparent supervision also facilitates mutual accountability and clarifies expectations across all levels.

Effective communication competence, also with a mean score of 4.17 ($NV = 0.611$), is foundational to all aspects of project management. This competency relates to a supervisor's ability to deliver clear instructions, actively listen, and encourage open dialogue. Literature consistently ranks communication as a core driver of project success. Poor communication, on the other hand, is often cited as a leading cause of delays, misunderstandings, and failure (Fitch et al., 2014). Supervisors who communicate effectively not only foster smooth collaboration and timely conflict resolution but also ensure that expectations, both internal and external, are properly managed (Rehan et al., 2024). Strong communication skills thus play a vital role in ensuring that teams are aligned, informed, and equipped to meet project goals.

These five supervisory competencies, rooted in leadership, communication, quality assurance, and motivation, form the backbone of effective project supervision. Strengthening these areas offers a strategic pathway to improved project implementation, particularly in resource-constrained or rapidly changing environments.

Implications for Best Practices

These four components provide a structured framework for understanding and developing supervisory competencies that contribute to quality project outcomes. Importantly, the findings highlight that supervision is not a one-dimensional function; it integrates strategic task management, technical oversight, visionary leadership, and ethical governance. For organisations aiming to enhance delivery quality, these results support the design of competency-based training programs, performance evaluation systems, and recruitment strategies that prioritise these supervisory dimensions.

Conclusion

This study has empirically demonstrated that effective supervision plays a decisive role in achieving high-quality project outcomes. Through exploratory factor analysis, supervision was disaggregated into four key dimensions: Management and Motivation, Technical and Operational Competence, Leadership and Vision, and Accountability and Ethics, which together account for nearly 70% of the variance in project delivery performance. Within this framework, five supervisory competencies emerged as the most influential: quality control vigilance, problem-solving and decision-making ability, motivational engagement, supervisory transparency, and effective communication competence.

Notably, quality control vigilance ranked highest, underscoring the critical importance of continuous monitoring and adherence to standards in preventing rework and ensuring client satisfaction. Similarly, problem-solving and decision-making capabilities reflect a supervisor's ability to respond to challenges in dynamic environments, while motivational engagement reinforces the importance of interpersonal leadership in maintaining team morale and productivity. Supervisory transparency and effective communication further contribute by promoting trust, clarity, and alignment across project teams.

Together, these findings contribute to project management literature by offering a structured, evidence-based model for assessing and developing supervisory capacity. For organisations aiming to improve delivery outcomes, these results support the integration of clearly defined supervisory competencies into recruitment, training, and performance evaluation systems. Strengthening these areas not only enhances project efficiency but also builds more accountable, resilient, and people-centred project environments.

Future research may validate this framework across diverse sectors and explore mediating variables such as organisational culture or project complexity to deepen understanding of the supervision delivery link.

Reference

- Abdul-Fatawu, Y., Adjei-Kumi, T., & Acheamfour, V. K. (2024). Assessing Effective Project Communication Management on Construction Projects in Ghana. *International Journal of Scientific and Research Publications*, 14(3), 420-459. <https://doi.org/10.29322/IJSRP.14.03.2024.p14738>
- Abdelalim, A. M., Salem, M., Salem, M., Al-Adwani, M., & Tantawy, M. (2024). An Analysis of Factors Contributing to Cost Overruns in the Global Construction Industry. *Buildings*, 15(1), 18. <https://doi.org/10.3390/buildings15010018>
- Abdurezake, S. K., Mengistu, D. G., Abdela, S. A., & Tesfaye, B. Z. (2025). Construction professionals' retention practice in construction companies. *International Journal of Construction Management*, 1-16. <https://doi.org/10.1080/15623599.2025.2523923>
- Almashhour, R., Abuzaid, H., & El-Sayegh, S. (2024). Creativity in Project Implementation: An Empirical Study of Project Managers. *Buildings*, 14(3), 818. <https://doi.org/10.3390/buildings14030818>
- Amponsah, R. (2024). Improving project management practice in Ghana with focus on agriculture, banking and construction sectors of the Ghanaian economy (Doctoral dissertation, RMIT University).

- Ashraf, M. A. (2019). The mediating role of work atmosphere in the relationship between supervisor cooperation, career growth and job satisfaction. *Journal of Workplace Learning*, 31(2), 78-94. <https://doi.org/10.1108/JWL-12-2017-0113>
- Astagina, S., & Raharjo, T. (2025). Enhancing Agile Big Data Project Success using Project Management Body of Knowledge (PMBOK) Performance Domain. *Sebatik*, 29(2), 323-329.
- Aydın, M. (2025). Comparative Analysis of PMBOK Guide 7th Edition and ISO 21500: 2021 in the Context of Global Project Management Standards. *Journal of Architectural Sciences and Applications*, 10(2), 1062-1080. <https://doi.org/10.30785/mbud.1661373>
- Bazrkar, A., Iranzadeh, S., & Feghhi Farahmand, N. (2017). Total quality model for aligning organization strategy, improving performance, and improving customer satisfaction by using an approach based on combination of balanced scorecard and lean six sigma. *Cogent Business & Management*, 4(1), 1390818. <https://doi.org/10.1080/23311975.2017.1390818>
- Bello, A., Abdulraheem, A. A., Afolabi, O. P., Aka, A., & Gbenga, P. O. (2024). Assessing the underlying factors affecting trust and transparency in the construction industry: a mixed method approach. *Construction Economics and Building*, 24(1-2), 9-28. <https://doi.org/10.5130/AJCEB.v24i1/2.8906>
- Boateng, F. G. (2020). Building collapse in cities in Ghana: A case for a historical-institutional grounding for building risks in developing countries. *International Journal of Disaster Risk Reduction*, 50, 101912. <https://doi.org/10.1016/j.ijdrr.2020.101912>
- Bryde, D., Unterhitzberger, C., & Joby, R. (2018). Conditions of success for earned value analysis in projects. *International Journal of Project Management*, 36(3), 474-484. <https://doi.org/10.1016/j.ijproman.2017.12.002>
- Bucha, P. M. (2021). Influence of Governance Framework on Mitigating Building Failures in Kenya (Doctoral dissertation, JKUAT-COHRED). <https://doi.org/10.61426/sjbcv.v7i1.1529>
- Chadee, A. A., Mahabir, R., Banerjee, K. S., Verma, S., & Azamathulla, H. M. (2025). The causal nature of adopting standardized project management body of knowledge (PMBOK) on construction projects. *Discover Civil Engineering*, 2(1), 168. <https://doi.org/10.1007/s44290-025-00311-y>
- Famiyeh, S., Amoatey, C. T., Adaku, E., & Agbenohevi, C. S. (2017). Major causes of construction time and cost overruns: A case of selected educational sector projects in Ghana. *Journal of Engineering, Design and Technology*, 15(2), 181-198. <https://doi.org/10.1108/JEDT-11-2015-0075>
- Fellows, R. & Liu, A. (2015). *Research Methods for Construction*. 4th ed. West Sussex: *John Wiley and Sons Ltd*.
- Fitch, B. D., Means, R. B., & Seidel, G. (2014). The Role of Supervision in Motivating and Maintaining a Culture of Ethics. In *Law Enforcement Ethics: Classic and Contemporary Issues*. SAGE Publications, Inc. <https://doi.org/10.4135/9781071934289.n4>
- Ghafoor, S., Gurmu, A., Sadick, A. M., & Kite, J. (2025). Compliance risks in the construction of residential buildings: a systematic literature review. *Smart and Sustainable Built Environment*. <https://doi.org/10.1108/SASBE-11-2024-0507>
- Heydari, M., Heravi, G., Raeisinafchi, R., & Karimi, H. (2024). A dynamic model to assess the role of site supervision systems in the safety performance of construction projects. *Journal of Construction Engineering and Management*, 150(3), 04024001. <https://doi.org/10.1061/JCEMD4.COENG-13810>
- Hudson, F. S., Sutrisna, M., & Chawynski, G. (2021). A certification framework for managing the risks of non-compliance and non-conformance building products: a Western Australian perspective. *International journal of building pathology and adaptation*, 39(2), 312-343. <https://doi.org/10.1108/IJBPA-11-2019-0097>
- Judson, L., & Paul, V. K. (2022). Known uncertainty factors affecting building construction project cost. *Journal of Real Estate, Construction & Management*, 37(S1), 243-253. <https://doi.org/10.1177/297765702022S127>

- Kanki, B. G. (2019). Communication and crew resource management. In *Crew resource management* (pp. 103-137). Academic Press. <https://doi.org/10.1016/B978-0-12-812995-1.00004-X>
- Kerzner, H., Zeitoun, A., & Vargas, R. V. (2022). *Project management next generation: The pillars for organizational excellence*. John Wiley & Sons. <https://doi.org/10.1002/9781119832300>
- Kwafo, D. G. (2021). *Strategies for Improving Performance of Project Managers in Ghana to Reduce Delays* (Doctoral dissertation, Walden University).
- Li, S. (2024, May). Innovative Approaches to Architectural Design Supervision. In *2024 International Conference on Applied Economics, Management Science and Social Development (AEMSS 2024)* (pp. 448-454). Atlantis Press. https://doi.org/10.2991/978-2-38476-257-6_53
- Love, P. E. (2025). Moving Beyond the Explanatory Theorizing of Project Behaviour for Infrastructure Mis-performance: Nothing is So Practical as a Good Theory. *IEEE Engineering Management Review*. <https://doi.org/10.1109/EMR.2025.3589205>
- Lufumpa, C. L., & Yepes, T. (2017). Rapid urbanization and the growing demand for urban infrastructure in Africa. In *Infrastructure in Africa* (pp. 89-110). Policy Press. <https://doi.org/10.56687/9781447326656-009>
- Mjakuškina, S., Kavosa, M., & Lapiņa, I. (2019). Achieving sustainability in the construction supervision process. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(3), 47. <https://doi.org/10.3390/joitmc5030047>
- Müller, R., & Lecoeuvre, L. (2014). Operationalizing governance categories of projects. *International Journal of Project Management*, 32(8), 1346-1357. <https://doi.org/10.1016/j.ijproman.2014.04.005>
- Nielsen, K., & Daniels, K. (2012). Does shared and differentiated transformational leadership predict followers' working conditions and well-being?. *The Leadership Quarterly*, 23(3), 383-397. <https://doi.org/10.1016/j.leaqua.2011.09.001>
- Olawale, O. (2024). *A multi-dimensional evaluative framework for examining project reputation within the construction industry: Contractors' perspective* (Doctoral dissertation).
- Ogundipe, K. E., Olaniran, H. F., Ajao, A. M., & Ogunbayo, B. F. (2018). Assessing the impact of quality supervision on construction operatives' project delivery in Nigeria. *International Journal of Civil Engineering and Technology*, 9(9), 426-439.
- Rehan, A., Thorpe, D., & Heravi, A. (2024). Project success factors for leadership practices and communication: challenges in the construction sector. *International Journal of Managing Projects in Business*, 17(3), 562-590. <https://doi.org/10.1108/IJMPB-12-2023-0279>
- Somiah, M. K., Aigbavboa, C. O., & Thwala, W. D. (2022). Critical success strategies for competitive advantage of indigenous construction firms in developing countries: A Ghana study. *Global Business Review*, 23(5), 1188-1199. <https://doi.org/10.1177/0972150920907258>
- Sumner, M., & Slattery, D. (2010). The impact of leadership effectiveness and team processes on team performance in construction. *International journal of construction education and research*, 6(3), 179-201. <https://doi.org/10.1080/15578771.2010.507720>
- Tengan, C., Aigbavboa, C. O., Guribie, F., & Annor-Asubonteng, J. (2019). Analysis of the outcome features of effective monitoring and evaluation in construction project delivery. *Journal of engineering, design and technology*, 17(6), 1192-1201. <https://doi.org/10.1108/JEDT-03-2019-0076>
- Turner, J. R. (2014). *The handbook of project-based management* (Vol. 92). New York, NY: McGraw-Hill Education.
- Walter, S. F. (2018). *Integrating Empowerment into Project Management to Enable Effective Delegation of Decision-Making Authority to Project Managers and Teams* (Doctoral dissertation, Northcentral University).
- Zidane, Y. J. T., & Andersen, B. (2018). The top 10 universal delay factors in construction projects. *International Journal of Managing Projects in Business*, 11(3), 650-672. <https://doi.org/10.1108/IJMPB-05-2017-0052>