Contractor Capacity Development Theories and Frameworks: A Review and Implications for Contractor Development Programs

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ABSTRACT
Capacity development programs for construction contractors have enhanced the empowerment of stakeholders in the construction industry regarding the execution of infrastructure projects. The construction industry has evolved through the adoption of many ideas and theoretical frameworks to build diverse capacity development programs. Nonetheless, despite numerous capacity development initiatives, local contractors have exhibited minimal involvement in large-scale infrastructure projects. Stakeholders have consistently expressed discontent with the trained local contractors. This study examines research on theories and frameworks utilized in the formulation of contractor capacity development programs. The systematic literature evaluation indicated a paucity of research about theories and frameworks within the studied domain. A total of 52 articles were incorporated into the analysis. The publication trend indicates that the majority of research is conducted in developed countries, specifically the United Kingdom (9 publications) and the United States (7 articles). Despite South Africa's (6 articles) preeminence in publication among developing nations, it indicates a necessity for further research in these countries. The study identified the construction industry, contractors, sustainable development, project management, and decision-making as the principal discussion themes of the past decade. The study demonstrates that adopting a collaborative approach enables stakeholders to cultivate innovation, enhance excellence, and equip contractors to address the challenges and opportunities of the 21st century, thereby contributing to a more resilient and equitable built environment. Therefore, future research should focus on the development of capacity development programs that align with stakeholder requirements.

Keywords:
Construction, Contractor, Capacity Development, Sustainable Development, Frameworks.

1. INTRODUCTION
Capacity development is an extensive and evolving process aimed at improving the competencies of individuals, organizations, and broader systems to perform critical functions, address major challenges, and attain defined objectives sustainably (El-Taliawi and Wal, 2019). Capacity development initiatives inside organizations seek to cultivate an atmosphere that promotes employee advancement, focusing on attitudes, knowledge, and skills to facilitate both immediate and enduring corporate goals (Onyiego and Njoroge, 2020). This involves a thorough strategy that encompasses identifying existing employee skill gaps, strategically cultivating essential competencies and adaptive mindsets, optimizing operational procedures for improved efficiency, and providing adequate resources to empower employees to excel in a dynamic and competitive landscape (Onyiego and Njoroge, 2020; Mwaniki and Wachira, 2021)

This study seeks to elucidate research trends, collaboration patterns, and publication impacts, augmenting conventional qualitative evaluations with quantitative data derived from scientometric studies (Galli, 2019). This study reduces subjectivity in analysis by employing statistical approaches to assess research materials (Galli, 2019). This paper examines trends in published research on capacity development initiatives, emphasizing theories and frameworks, and assesses their relevance and implications for contractor development programs. The research delineates and consolidates optimal approaches in capacity development, utilizing ideas from various industries and circumstances.

2. LITERATURE REVIEW
Capacity development is a complex process requiring the active involvement and dedication of various stakeholders, such as individuals, community organizations, private enterprises, academic institutions, and government agencies (Poudel, 2012). Strategic capacity involves the alignment of resources with institutional objectives (Salvador and Sancho, 2021). Organizational management capacity facilitates efficient resource allocation and process optimization.

Collaborative capacity involves developing strong partnerships and complex networks that go beyond traditional organizational limits, enabling stakeholders to work together on solving complex issues and to create comprehensive solutions that utilize the varied expertise and resources of each participating entity (Popering-Verkerk *et al*., 2022). Collective action, coordination, resilience, learning, and resources constitute essential components of governance capacity.

2.1. Theoretical Framework for Capacity Development

Capacity development necessitates ongoing progress monitoring to facilitate adaptive learning, emphasizing collaborative governance, strategic alignment, resource allocation, evaluation, and responsiveness (Saxena *et al*., 2021). Engaged and dedicated leadership is crucial for the success of capacity development projects. Moreover, effectively employing communication channels to convey and contextualize the notion of innovation within the local context is essential for fostering broad acceptance and internalization (Palm, 2020). The efficient conversion of learned knowledge into action is a vital component of sustainable development. This process requires robust governance systems that foster collaborative management of shared resources, promote equitable practices, and mitigate the uncertainties related to sustainability (Clark and Harley, 2019; Cvetković *et al*., 2021). Capacity development is sometimes presented as a strategy for enhancing outcomes; nevertheless, its implementation may sometimes be redirected towards alternative aims, such as influencing foreign governments. Many organizations, particularly smaller ones, demonstrate a genuine dedication to reforming institutions and fostering societal change that effectively improves long-term capability and establishes a sustainable competitive advantage (Howlett and Ramesh, 2014; Cyfert *et al*., 2021).

2.2. Programs for Capacity Development

Capacity development fundamentally revolves around the principles of self-reliance and self-determination, highlighting the importance for nations to create and execute their developmental agendas via participatory, bottom-up approaches (Sokona, 2021). External assistance may serve as a catalyst; however, it is the internal capacity of a nation and its populace that ultimately determines the path of sustainable development. Strategic investment in capacity development initiatives across all levels of an organization is essential for both immediate progress and long-term development (Kumar *et al.,* 2020). Capacity development involves the enhancement of human, professional, organizational, and systemic capacities (Ilyas *et al*., 2022). Capacity development enhances skills, knowledge, and attitudes, which are crucial for addressing challenges and proactively mitigating potential problems (Adisa *et al.,* 2021).

3. METHODS

Bibliometrics is a quantitative, descriptive research methodology that involves the collection of data from many databases. The bibliometric analysis comprises two primary phases: the collection of general statistical data and the mapping and cluster analysis utilizing VOSviewer software. Bibliometric analysis is an efficient method for offering comprehensive insights into the features of publication volume within a specific research subject. This study utilized the Scopus database for data collection, which was subsequently analyzed statistically using Microsoft Excel to determine annual publication trends and growth patterns, along with the creation of tables and graphics for presentation. Utilizing the Scopus database, a total of 4,183 publications were gathered employing a title-abstract-keyword search method pertinent to the topic of capacity development programs in construction. Scopus was selected because of its extensive multidisciplinary coverage, complete bibliometric data, high publication novelty rate, and superior credibility (Onososen *et al*., 2022; Bringas *et al*., 2022).

Additionally, the data was input into Vosviewer software to achieve advanced visualization, showcasing elements such as clustering analysis, co-author analysis, and co-occurring keywords, among others. The software presents distribution data using three visualizations: network visualization, overlay visualization, and density visualization. The network and overlay visualization created bubbles reflecting research dominance, while the density visualization illustrates the spread of research through colour density. The area exhibits yellow coloration at higher publication levels, whilst lesser publication levels are represented by shades of blue to dark blue. The colour clustering and descriptions in each visualization help determine the novelty degree of the study conducted and forecast future publication trends.

Following the initial search conducted on 10th June 2025, which produced 4,183 documents, filters were implemented to narrow the focus to the relevant subject area, document type, language, publication stage, source type, and publication dates. The application of these filters resulted in 580 articles being returned. A manual review of the titles and abstracts of the retained 580 documents to determine the suitability of these articles for the study yielded a final dataset of 52 articles. These articles were then exported to a Comma-Separated Values (CSV) file and formed the basis for analysis.

Scientometric techniques utilized for data analysis encompass the annual distribution of publications to identify growth trends and potential shifts in research focus over time, the examination of frequently used keywords and their co-occurrence patterns to elucidate primary research themes and emerging areas of interest, and the analysis of citation data to ascertain the most influential articles, authors, and journals within the field. This may unearth significant research and lead scholars in construction development theories and frameworks in developing economies, and uncover the knowledge gap in program implications for contractors.

The theme coding approach was used to extract repeating structures, assumptions, and thematic emphases across articles; codes were produced inductively but organized into predetermined categories. Emergent themes from the scientometric findings were examined in order to construct a coherent narrative about shifting research objectives and potential disconnects between academic concentration and practical applicability. Using these methodologies, this study gives useful insights into the existing level of knowledge, research trends, and rising areas of focus in the construction sector of developing economies. The analysis identifies significant issues and opportunities associated with sustainability, resilience, responsiveness, and future directions in construction processes. Figure 1 below shows the overall research approach that was adopted in this study.

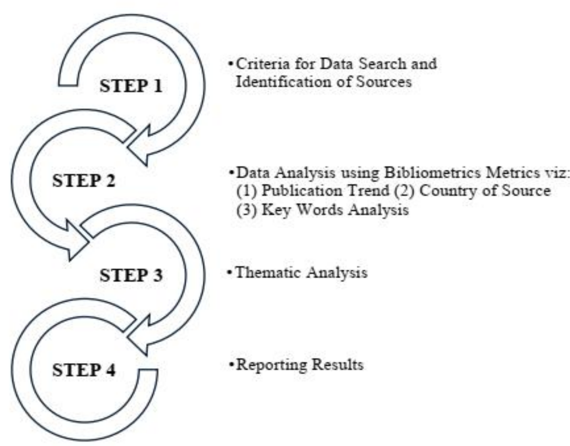

Figure 1. Systematic approach of the research

4. RESULTS

4.1. Publication Trend Analysis

Analyzing the adopted articles to determine publication trends, an uneven pattern was observed from 2014 to 2025. There were no publications in 2019, but the number rose to five in 2020, before dropping to two in 2021 and rising again steadily to 11 in 2024. There are 10 articles in 2025 due to the date of analysis being June 2025. Figure 1 below shows the publication trends between 2014 and 2025

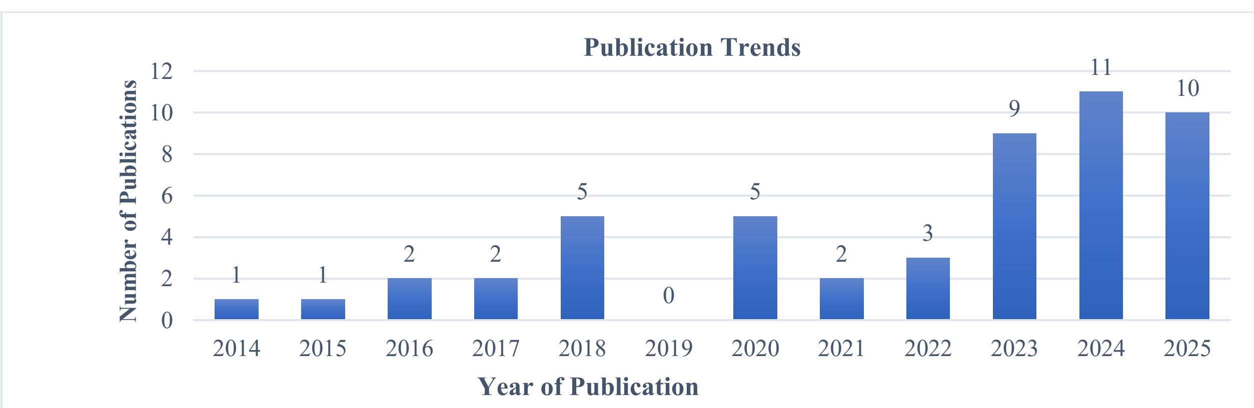

Figure 1: Publication Trend Analysis

4.2. Country of Origin

Among the top ten countries, the United Kingdom leads in publications with nine articles, followed by the United States of America and India, contributing seven articles each. South Africa follows with 6 articles, South Korea, Turkey, and Hong Kong, each contributed two articles. Figure 2 depicts the publication countries.

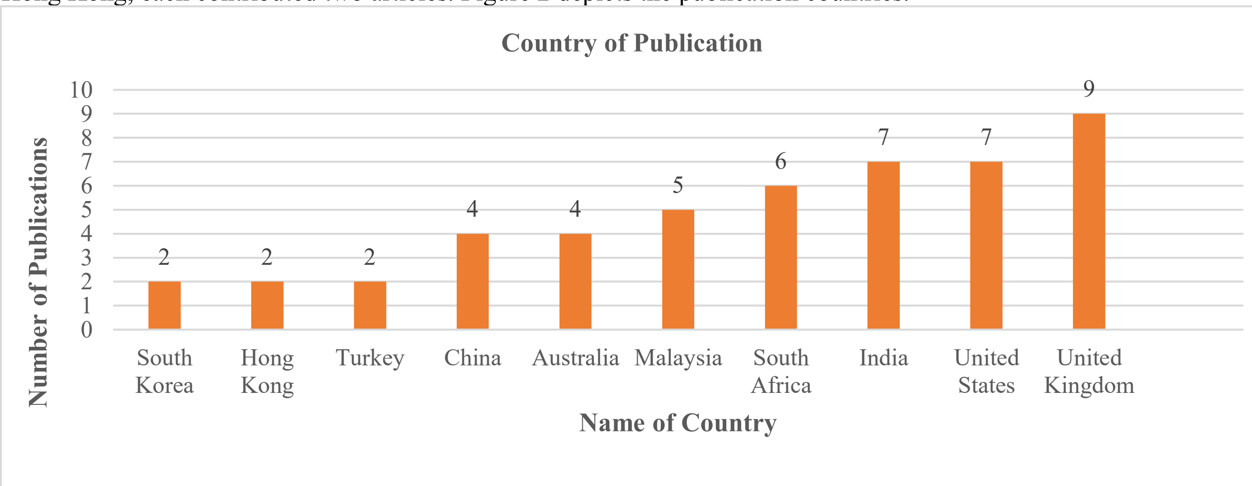

Figure 2: Country of Origin

4.3. Key Words Analysis

Research articles contain keywords. According to Van Eck and Waltman (2014), keywords represent the relationship between different areas of knowledge and the organization of research topics. Upon visualizing the keywords and examining the top five clusters, the main themes discussed were “Construction Industry”, "Contractors", "Project Management", "Sustainable Development", and “Decision Making”. The most commonly co-occurring and linked keyword was “Construction Industry”, with 20 co-occurrences and 39 links. "Frameworks" and “Leadership” were the least commonly co-occurring keywords, with two occurrences, 4 links, and 2 links, respectively. Figure 4 displays the visualization of the keywords. Figure 3 depicts the keywords network visualization conducted in June 2025.

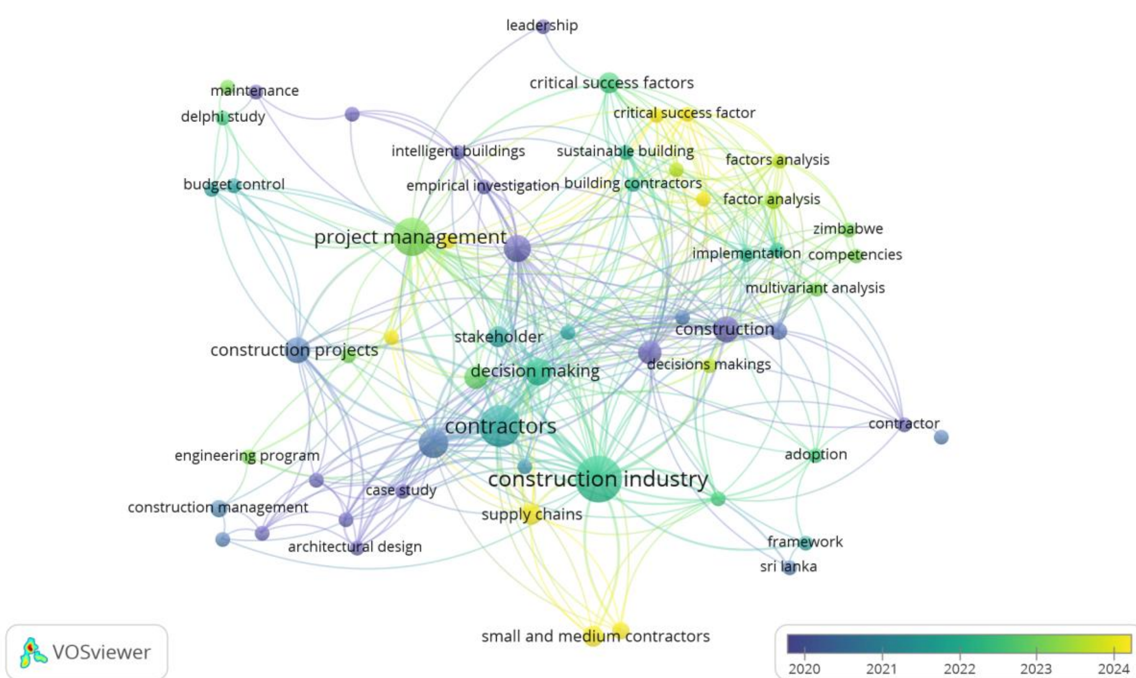

Figure 3: Keyword Visualization

5. DISCUSSION

Literature reviews are essential elements of academic research, providing foundational syntheses of knowledge on certain subjects (Bolderston, 2008; Lim *et. al*., 2022). These evaluations assess previous research, offering a thorough summary of the current knowledge within a discipline (Okoli and Schabram, 2010; Siddaway *et. al*., 2018).

5.1. Research Trend

Research trends demonstrate a concentrated academic interest in particular regions or nations. The incorporation of 52 papers over the last decade highlights the necessity for additional research in this domain, especially in developing countries. The ascent commenced with a solitary publication in 2014, culminating in a zenith of five publications in 2018. This higher tendency indicates an increasing interest and appeal of transition within the academic field. Significantly, there were no publications in 2019, presumably due to the COVID-19 epidemic that devastated the globe and affected academic research within the construction sector. Despite an increase to five publications in 2020, there was a subsequent decrease to two publications in both 2021 and 2022. A significant increase in total publications occurred in 2023 and 2024. This may be ascribed to the emergence of a novel and sustainable methodology in the construction sector, technological progress, and geopolitical shifts in developing economies that may have stimulated increased research on how to address these various innovative transitions and technological advancements in the construction industry. The unequal distribution and small quantity of papers in the past decade indicate that further research is essential to enhance comprehension in this domain. Notwithstanding these deficiencies, Figure 1 emphasizes the robust interest and competitive environment in this area, underscoring the importance of sustained innovation and the dissemination of high-quality contributions to promote continuous advancement.

5.2. Source of Publication

Research on capacity development has attracted considerable global attention because of its ability to improve performance and resilience, especially in the infrastructure sector of poor nations. Figure 2 illustrates the countries that satisfy a certain set of requirements for a minimum of two publications and two citations. This analysis indicates that developed nations predominantly produce research outputs in this domain, particularly highlighting a significant concentration from industrialized countries, notably the United Kingdom, with nine publications, and both the United States and India, with seven articles apiece. Although developing economies are contributing to research initiatives, with South Africa at the forefront with six publications, there is an ongoing issue about stakeholder discontent with the competencies of skilled local contractors. Emerging economies could capitalize on these connections to enhance research outputs and address the ongoing discontent of construction sector stakeholders. The limited publication rates in developing economies, exemplified by merely two publications in regions such as Hong Kong, necessitate enhanced collaborative initiatives and strategies for capacity development programs.

5.3. Co-Occurrence of Keyword

Keywords are employed to examine the content of each thematic cluster, as detailed by Donthu et al. (2021), and their presence in a research publication by Wuni et al. (2019). The selected articles reveal five primary themes: "construction industry" (20 occurrences), "contractors" (16 occurrences), "project management" (13 occurrences), "sustainable development" (8 occurrences), and "decision-making" (7 occurrences). The primary issues addressed in these publications, especially regarding the construction industry and contractors, underscore their importance within the discipline. Capacity development consistently engages various contractors in the construction sector. References to “sustainability” (5 occurrences), “adoption” (2 occurrences), “green buildings” (2 occurrences), and “competition” (2 occurrences) highlight the significance of promoting sustainable infrastructure via technological adoption and innovation by qualified industry stakeholders. The terms “framework,” “competences,” and “stakeholders” highlight the significance of adopting pertinent capacity development frameworks that enhance competition and address construction development programs that consider a competitive environment and stakeholders in the construction sector.

The term "information theory" implies the incorporation of relevant theoretical frameworks into capacity development efforts. The research trends, as evidenced by the transition in colour from green to yellow between 2023 and 2024, suggest an increasing emphasis on “small and medium-sized contractors”, “critical success factors”, and “sustainable development”. This underscores the critical function of small and medium-scale contractors in the construction sector and the necessity of recognizing success factors to promote sustainable infrastructure development. The reference to countries like Malaysia, Zimbabwe, Ethiopia, and Sri Lanka indicates a focus on regional research in developing economies. Although “contractors,” “sustainable development,” and “project management” are key themes, there are associated issues regarding "supply chain" management and the "economic and social effects" that may impact the effective execution of capacity development programs. The presence of terms like "leadership" and "decision-making" suggests potential avenues for further investigation into stakeholder engagement and influencing processes that may improve the execution of capacity development initiatives in line with sustainable development goals.

6. IMPLICATIONS FOR CONTRACTOR DEVELOPMENT PROGRAMS

Contractor development programs are essential for promoting the growth and sustainability of construction businesses, particularly small and medium-sized organizations, by providing them with the necessary skills, expertise, and resources to compete effectively in the construction industry. Programs must be properly crafted to tackle the diverse difficulties faced by contractors, including financial management, technical expertise, project management skills, and strategic business planning (Abera, 2021). The rising incidence of reports on shortages of skilled construction workers underscores a significant barrier to optimal project performance; these shortages are frequently intensified by insufficient training and apprenticeship programs, an aging workforce, and an inability to engage younger generations in the construction trades (Castañeda et al., 2003). The construction business is frequently depicted unfavourably due to project abandonment and substandard execution, thus affecting contractor reputations (Halim, 2014). Contractor development programs must include extensive training modules on safety management, quality control, and environmental sustainability to promote responsible construction practices and ensure adherence to industry standards and regulatory requirements (Abas *et al*., 2020).

A comprehensive needs assessment is essential for the success of any contractor development program, as it identifies specific deficiencies and challenges faced by contractors, allowing for the creation of targeted interventions that address their unique needs and promote sustainable development. Contractor development initiatives must prioritize the establishment of strong stakeholder relationships via proactive communication, collaborative problem-solving, and strategic conflict resolution, thereby improving contractors' capacity to manage the intricate expectations of clients, subcontractors, suppliers, and regulatory authorities (Taimu *et al.,* 2020). The construction industry's shift towards enhanced sustainability requires contractor development programs to actively incorporate training on green building practices, energy-efficient technologies, and waste reduction strategies, thereby equipping contractors with the necessary skills and knowledge to foster a more environmentally responsible built environment (Siddiqi *et al*., 2008).

The construction industry is undergoing a significant transition towards increased digitization, requiring construction workers to have expertise in computing and programming skills (Siddiqui *et al*., 2023). The demand for digital skills is heightened by the growing implementation of robotics and automation in building processes, which are expected to improve efficiency and decrease labour expenses (Onososen and Musonda, 2022). These programs ought to promote collaboration and knowledge dissemination across contractors, enabling the exchange of best practices, lessons learned, and innovative solutions to shared difficulties. Incorporating these factors allows contractor development programs to substantially enhance the resilience, competitiveness, and sustainability of the construction sector. Additionally, contractor development programs must emphasize the promotion of ethical behaviour, transparency, and accountability within the construction sector, cultivating a culture of integrity and trust among contractors, clients, and stakeholders.

7. CONCLUSION

This study employed bibliometric and science mapping techniques to objectively assess the literature on capacity development initiatives for local construction contractors, emphasizing the implications for contractor development programs, particularly in developing economies. The findings demonstrate a distinct necessity for additional investigation in this domain, as reflected by the scant quantity of publications (n=52) published in the last ten years. Developed economies prevail in the publication landscape, while emerging nations persistently underperform, despite getting financial and technical support from financing entities intended to train local construction contractors. These findings provide organizations with critical insights into the evolving research landscape in construction development theories and frameworks, encompassing important journals, emerging research themes, and prospective directions. Future research must prioritize examining the influence of stakeholders and supply chain processes on the development of contractor development programs in developing economies, while striving to reconcile technological innovation with economic and social effects.

Furthermore, the majority of the publications originate from affluent nations rather than developing countries, highlighting a gap in localized, context-specific research necessary for addressing the unique challenges faced by local contractors in these regions. The significant contributions from the United States of America and the United Kingdom suggest that existing research may not fully represent the realities and stakeholder needs of developing economies.

While "construction industry" and "contractors" are prominent themes, the reduced focus on "frameworks" and "theories" indicates that the role of frameworks and theories in the collaborative capacity development process has not been thoroughly examined.

8. LIMITATIONS

This research recognizes specific limitations. The data employed in this paper were solely obtained from Scopus and pertain to the last decade, suggesting that alternative literature may be available through other academic search engines that could offer varied insights into the analysis. Moreover, restricting the selection to papers published solely in English may yield inadequate conclusions, as pertinent publications may exist in other major languages from industrialized nations.

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