

HOSTED BY



ELSEVIER

Contents lists available at ScienceDirect

Asia Pacific Management Review

journal homepage: www.elsevier.com/locate/apmr

Project manager's leadership behavioural practices – A systematic literature review

Ashok Rehan^{*}, David Thorpe, Amirhossein Heravi

School of Surveying and Built Environment, University of Southern Queensland, Queensland, Australia

ARTICLE INFO

Article history:

Received 26 June 2023

Received in revised form

20 November 2023

Accepted 25 December 2023

Available online 8 January 2024

Keywords:

Leadership practices

Leadership behaviours

Leadership characteristics

Construction projects

Communication

Project management and project success

ABSTRACT

The emergence of new technologies, artificial intelligence, BANI environment and multidimensional complexity in projects requires project managers to have an innovative instinct to formulate efficient project management practices to achieve project success. Most articles in the extant literature have discussed leadership factors impacting project success; however, leadership behavioural practices encompassing characteristics/dimensions have not been considered and discussed in a unified manner. Therefore, a need arises with an objective for such a study to bridge the gap of a systematic literature review on leadership behavioural practice characteristics and provide a unified summarised effort to understand relationships with project success from relevant studies between 2000 and 2021. A sample of 72 out of 2805 articles was finally selected for rigorous analysis in a seven-step literature review process. This SLR has identified high to moderate levels of tangible managerial interpersonal and emotional behavioural practice characteristics compared to low-level task-oriented and intellectual practices on construction projects. Compelling evidence shows that relationship-building and people-oriented project leaders using effective communication and collaborative working are highly valued compared to task-oriented project leaders on successful construction projects. Effective leadership practices and findings from this SLR will provide a benchmark for future researchers to investigate further construction projects to generalize SLR outcomes on a broader scale. In addition, project organizations can use our identified cluster listings of behavioural practice characteristics during their recruitment process of project professionals. Low-valued soft skills in our analysis need more investigations in future research.

© 2023 The Authors. Published by Elsevier B.V. on behalf of College of Management, National Cheng Kung University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Globalization contributes to physical infrastructure built through construction activities, leading to complexity and challenges in managing projects. The growth of projects globally with heavy annual investment has exposed project management professionals to challenges in delivering projects under many multi-lateral issues and constraints. “Successfully managing projects requires various skills including technical competency, interpersonal sensitivity, and cognitive aptitude of team members along with the capability to understand the project objectives and then

dynamically integrating appropriate leadership behaviours” (Strang, 2007). “To cope with these challenges, Mantel et al. (2004) identified areas like leadership, communication, team building, organizational and technical skills to accomplish project objectives”. However, due to the challenging environment of the construction industry and increasing realization of the human side of project management, changing demographics, the complexity of globalization, and new technologies, construction leaders' focus has shifted to implement new competitive strategies and adopt new practices. For several years, the paradigm of construction leaders has been technology and project-oriented and focused mainly on management (Toor & Ofori, 2008). The technology has been used in advancing construction processes to design and manage construction projects or utilizing new construction materials, tools, and construction techniques. However, in recent years, the importance and role of leadership in delivering successful construction projects have been recognized. Though the importance of leadership has been accepted in the project management

^{*} Corresponding author.

E-mail addresses: u1138430@uemail.usq.edu.au (A. Rehan), David.Thorpe@usq.edu.au (D. Thorpe), Amirhossein.heravi@usq.edu.au (A. Heravi).

Peer review under responsibility of College of Management, National Cheng Kung University.

literature, researchers often emphasize technical factors in determining a project's success or failure rather than addressing leadership and management styles and practices (Toor & Ofori, 2008). Although leadership contributions to project success and failure have been researched extensively, discussions continue to provoke debate and have been rarely agreed upon (Pinto & Slevin, 1988a). Construction leadership continues to encounter challenges due to globalization, including the COVID-19 pandemic, which exposed the fragility of supply chains across the construction sector and impacted unforeseeable effects on project organizations and businesses. The pace of technological advances and the need for adaptive capability, environmental degradation, depleting stocks of vital natural resources and climate change, rapid urbanization, waves of epidemics and pandemics are some of the other challenges that the leaders face today in achieving project success in the construction industry. Researchers and academicians continue to investigate the leadership's changing requirements to counter the challenges faced by the industry.

The VUCA world (Volatility, Uncertainty, Complexity and Ambiguity) of the 2000/2010s has been exposed by COVID-19, which was realized by the leaders the world over as an insufficient tool to deal with the chaotic challenges faced today by the industry. Jamais Cascio introduced the new acronym BANI (Brittle, Anxious, Nonlinear, and Incomprehensible) model to deal with the chaotic environment in the business world and is becoming commonplace in the post-pandemic change management discourse. According to Jamais Cascio, VUCA is for the present, and BANI names the future (Ray, 2023). The present and future challenges expose the construction business environment to susceptibility to catastrophe events, creating anxiety in the construction marketplace. BANI emphasizes that any organization's direction is impossible to comprehend, let alone control. In a BANI environment, emerging scenarios and chaotic conditions are impossible to predict and plan for. Instead, organizations must be able to adapt to any situation they face (Ray, 2023). To achieve sustained success in this turbulent environment, construction organizations must develop a sense of agility in the leadership role, including using an authentic leadership style that matches the complexity and chaotic conditions and learning to navigate constant change and manage the multidisciplinary interlinkages. The business environment is moving from the VUCA (volatility, uncertainty, complexity, and ambiguity) to the BANI (brittle, anxious, nonlinear, and incomprehensible) world. BANI world sets completely new needs for the application of digital technologies. The construction leaders need to strive for continuous improvement in creativity, collaboration, and cross-functionality individually and in teams, ensuring flexibility, adaptability, developing trust among project team members, innovation, and resilience (meaning adopting an agile and authentic leadership style to achieve project success) while dealing with VUCA and BANI environment. The changing conditions and cross-cultural challenges in the business world call for a renewed vision for leadership and demand fresh attention on restoring positive leadership in organizations to achieve project success.

Leadership has not so far been defined to the satisfaction of all since it is a complex and ever-evolving dynamic concept that deserves further study (Nixon et al, 2012). Liphadzi et al., (2015) addressed leadership as a vital element in the performance of any organization, and it is even more critical to the construction sector due to its complexity. Thus, it is essential to understand how leaders influence behaviours, impact project directions, and overcome resistance in managing projects. Moreover, it is also necessary to understand their leadership behavioural practices for project success. The success of a construction project depends on several factors; one of importance is the project manager's leadership style (Ogunlana, 2011). Leadership styles and practices

dimensions practised by the leaders have been identified as one of the main factors contributing to project-based construction organizations' success. Leadership styles are viewed as the combination of traits, characteristics, skills, and behaviours that managers use to interact with project network team members. Leadership is not a "one size fits all" concept (Liridon et al., 2017). Therefore, it would be appropriate and essential for project managers to adopt different leadership styles/practices during the project stages to achieve the objectives.

Over the number of decades, researchers have examined the leaders' traits, styles, skills, profiles, and motivational factors for project managers to achieve success in projects; however, there is a scarcity of systematic reviews available in project management literature on leadership behavioural practice characteristics leading to project success. Leadership behavioural practices are a powerful tool project managers use to influence a project's outcome.

Various articles on transformational leadership impacting project success can be found in the extant literature. Iqbal et al. (2019) investigated transformational leadership factors based on different leadership models impacting project success. Aga et al. (2016) investigated the mediating role of team building between transformational leadership and project success, and (Yang et al., 2012) discussed the mediating role of teamwork between leadership style and project success. In a recently published article, Bagga et al. (2022) investigated the effect of organizational culture between leadership and change management in virtual teams. Rehman et al. (2019) recently investigated project managers' different leadership behaviours (task- and relationship-oriented) and their impact on driving job attitudes and outcomes. Tunji (2022, pp. 1–8) identified trust as an essential element for effective leadership and development of exemplary organizations. Tunji further emphasized a close relationship between trust and collaboration in multidimensional construction projects. Sampaio et al. (2021) claimed leadership as a core behavioural characteristic competency for project managers in reviewing 27 articles where leadership was considered to facilitate achieving project goals. Gruden and Stare (2018) identified the most influential behavioural characteristics (e.g. leadership, results orientation, assertiveness, reliability, and efficiency) and verified their influence on improving the successful delivery of projects. Researchers in the project management literature have discussed leadership factors impacting project success; however, project managers' behaviours encompassing dimensions/characteristics have not been considered and discussed in a unified manner in the literature given new emerging technologies, artificial Intelligence (AI), BANI environment and multilateral project complexities requiring project managers to have an innovative instinct to perceive and formulate efficient project management practices to achieve project success (Wang, 2014, cited in Xiao et al., 2019).

Additionally, as discussed earlier, the fragility in VUCA exposed by COVID-19 has unpredictable consequences in the industry due to various challenges created by the chaotic business environment and the paradigm shift from VUCA to the BANI environment. Therefore, a need arises with an objective for such a study to bridge the gap by investigating and identifying important leadership practice behavioural characteristics and providing a unified summarised effort on behavioural practice characteristics for project professionals to use in achieving project success. It has become imperative to investigate leadership behaviour characteristics further to face modern-day challenges. There is an increasing awareness of the value of project managers' behavioural practices and skills/characteristics applied in project management (Gruden & Stare, 2018). "For instance, Sang et al. (2018) concluded that behavioural practices/skills such as leadership, organization, target management and emotional intelligence are crucial factors that

affect project performance". Furthermore, [Alvarenga et al. \(2019\)](#) confirmed that soft skills like leadership and communication, are among the topmost important elements for successful project management. Project managers' leadership and communication are the main predictors of a project manager's successful performance, considerably affecting project success ([Moradi et al., 2020](#)). As a result, project managers need to adopt appropriate leadership practices and communication characteristics in a consistent manner under project constraints ([Geoghegan & Dulewicz, 2008](#); [Muller et al. 2012](#)).

[Stevenson and Starkweather \(2010\)](#) found six key behavioural competencies: leadership, communication, verbal and written skills, ability to deal with ambiguity, and change, which are indicative of characteristics crucial to successful project management. [Sang et al. \(2018\)](#) investigated 262 project managers and verified leadership as one of the most critical skills for promoting project success. [Ziek and Anderson \(2015, pp. 788–803\)](#) stated that project managers use communication competencies to communicate more effectively in different contexts: team management, negotiation, developing stakeholders' relationships, and conflict management, ultimately impacting project success. [Zulch \(2014\)](#) determined the importance of characteristics (e.g., trust, collaboration & teamwork) that a project manager should possess to ensure successful communication. ([Gruden & Stare, 2018](#); [Stevenson & Starkweather, 2010](#)) call for comprehensive research on project managers' leadership practice characteristics to improve our understanding of the leadership practice characteristics required to achieve project success. Therefore, it is imperative to investigate further this aspect of leadership that impacts project success in the current complex project environment.

There have not been any unified summarised efforts on this subject in the literature. There seems to be a scarcity of systematic literature reviews on leadership behavioural practices characteristics in the construction sector to counter new emerging technologies, a paradigm shift from VUCA to BANI environment, artificial Intelligence and multilateral project complexities requiring project managers to have innovative behavioural practices to face modern-day challenges. The current SLR study has summarised the literature on project managers' leadership and communication practices characteristics leading to project success. This review has been carried out to research calls to explore further leadership behavioural practices' understanding to achieve project success, bridge the existing gap in the literature and provide a basis for future research directions. The remaining parts of this review are structured as follows:

The second section contributes and provides a three-step method (literature search, literature selection, and content analysis) to identify and summarise relevant articles. The third section provides an analysis of the collected information and data. Finally, the results are discussed in the subsequent sections, followed by theoretical and practical contributions, concluding remarks, limitations, and future directions.

In order to contribute to leadership research literature, this study has been carried out to answer the following research questions: (1) What are the vital leadership behavioural practices characteristics used in the construction sector globally to achieve project success? (2) What are the research trends and researchers' interest in leadership practices in the literature? (3) What leadership practice characteristics do project managers most value in the construction sector to achieve project success? (4) What are the popular research methods and sample sizes used in cited studies on leadership and communication practices in the literature? Despite the prevalence of visualizing leadership in the literature, this study intends to survey the current state of knowledge in this area and provide project professionals and researchers with fruitful insights

from the existing literature. Various research studies underpinning leadership practices and their relationship with project success have been pursued, which helped us identify the latest trends, the purpose of the study, the methodologies used, and the sample sizes selected for conducting research. Several leadership theories and frameworks in the literature provide us with directions to understand different leadership styles, practices, and approaches. The conceptual foundation for examining the relationships between leadership practices, communication, project network dynamics and project outcomes is guided by these frameworks for achieving project success. The Multifactor Leadership Questionnaire is a popular theoretical framework for leadership understanding ([Bass & Avolio, 2000](#)). A few other prominent theoretical leadership frameworks providing a conceptual foundation for relationship examination are found in the literature: transformational, transactional, servant, situational, charismatic, autocratic, and *faissez-Faire* leadership theories. These theoretical frameworks and models of leadership provide valuable insights into understanding different leadership behaviour practices, enabling individuals and organizations to develop effective leadership strategies and cultivate positive leadership behaviours. Leadership styles/practices are not mutually exclusive, and leaders often exhibit a combination of different styles depending on the circumstances. Effective leaders are flexible and adaptable, capable of adjusting their behaviours to meet their followers' needs and the project's goals. Various researchers have studied these theories using their characteristics to establish relationships among variables. The common themes across these frameworks are leadership, communication and vision, team building and collaboration, stakeholder management and project performance and outcomes.

2. Research methods and approach

Conducting a literature review serves as an excellent way of analyzing and synthesizing research findings, helping to identify the areas that requires further exploration and managing the diversity of knowledge arising from an academic inquiry ([Tranfield et al., 2003](#)). The SLR approach provides comprehensiveness, objectivity, transparency, impartiality, and systematic reporting of a particular area in previous studies in contrast to the traditional literature reviews ([Thorpe et al., 2005](#); [Weed, 2005](#)). [De Araújo et al. \(2017\)](#) confirmed that the SLR approach has been previously implemented within construction management literature and has proven suitable for extracting relevant information. Scholarly papers on leadership and project success-related research studies close to the topic of interest have been tracked and reviewed for our analysis and synthesis in this SLR.

This section briefly explains the SLR approach adopted in this research study. The structured approach starts with the literature collection, followed by literature analysis, and eventually succeeded by content analysis, where the findings of the SLR are discussed, followed by a conclusion. The authors have conducted an SLR search to collect relevant papers on this topic of interest and have analyzed the cited research studies, providing details on journals/publishers, the purpose of the study, research methods used, sample sizes, etc. The researchers might have missed some publications despite matching the research topic. On the other hand, some papers possibly have been included matching the research terms rather than based on the research topic.

A systematic literature review approach has been followed to collect relevant information/details that considered published material from past and recent research literature to provide a more comprehensive understanding of leadership behavioural practices dimensions and communication leading to project success. In addition, relevant peer-reviewed articles for successful projects

have been used for analysis and synthesis in textual and tabular form to identify their contribution to the literature. The rationale for choosing the systematic literature review approach was to find answers to the specified questions in this SLR and contribute significantly to the body of knowledge in the literature.

2.1. Methods

The current review methods comprise three significant steps: literature search, selection, and content analysis. The researchers adopted the guidelines and approaches from similar reviews (Snyder, 2019; Zhou et al., 2013).

2.1.1. Step 1: literature search

The literature search was conducted across the chosen topic through various electronic databases (for example, Google Scholar, Taylor and Francis and Emerald Insights). Publishers databases were used to retrieve the full text of articles. Google Scholar indexes websites with scholarly articles – including websites of academic publishers, university repositories and personal websites of researchers. Using an advanced search engine in Google Scholar, citations that are not provided by other databases were covered. Although multidisciplinary databases such as Web of Science and Scopus are citation databases and provide information from various disciplines, non-relevant results are hard to avoid during searches. In this SLR, we have chosen a few publisher databases and Google Scholar for our literature searches. The researchers reviewed the articles' published titles and abstracts for inclusion in the research study. Further, all the search results were limited to peer-reviewed journal articles published in English. A systematic search was undertaken to obtain relevant articles on leadership behaviours, leadership practice characteristics, and communication dimensions in the construction sector.

Following the approach of (Padalkar & Gopinath, 2016), the focus of the searches was limited to titles and abstracts of articles published in the project management/construction literature, and this was done to ensure that the articles included an adequate level of detail on leadership, communication, and project success.

2.1.1.1. Searched databases. Electronic databases such as Google Scholar, Emerald Insights, and Taylor and Francis have been used to collect information. The literature review for this research work involves collecting articles from reputed journals (identified by their aims and scope, peer review process, impact factor, indexing status, editorial board and publishing history) such as the International Journal of Project Management, Project Management Journal, Science Direct-Procedia Engineering, Asia Pacific Management Review, Leadership & Organization Development Journal, Construction and Architectural Management, Journal of Organizational Behaviour, Built Environment Project and Asset Management, Journal of Economics & Management, Engineering Management Journal, and European Management Journal, etc. This list is non-exclusive of journals.

As suggested by (de Araujo et al. 2017), a search was performed through various databases based on different keywords as listed below.

2.1.1.2. Searched keywords. This review used keyword search and free-text words to select relevant articles on leadership, communication, and project success in the construction sector.

An extensive search was conducted in the databases under the “article title/abstract/keyword” field. The search string, such as “leadership practices”, “leadership behaviours”, “communication dimensions”, “communication processes”, “leadership development”, “relationship management”, and “conflicts management” in

the construction sector, are used. For example, the full search string on a Google Scholar database was TITTLE-ABS-KEY (“leadership practices OR “leadership behaviours” OR “leadership development”) AND (“communication dimensions” OR “processes” OR “relationship management” OR “conflict management”) AND (“project success”) in the construction industry. Similarly, search string (“leadership practices” OR “leadership behaviours” AND “communication dimensions” AND “Project Success” in construction industry) was modified for Taylor and Francis database to align with our research questions and as per database requirements. These keywords were used in this review paper to retrieve relevant articles. For our reference, all identified articles from the systematic searches were exported into the Mendeley database. The extracted article numbers from various databases are given below:

Google Scholar – 1580, Taylors and Francis – 662 and Emerald Insights – 563.

2.1.2. Step 2: literature selection

A total of 2805 articles were identified by running the above strings on various databases per their requirements. A screening process was then followed based on title, keywords, and abstract extraction. The authors excluded citations related to book reviews, editorials, editor's notes, generics, letters to editors, news items and patents (2380). The number of relevant literature items was reduced to 425. The next step involved scrutinizing any duplicate publications, and the researchers deleted the duplicated articles (102) from the database search, reducing the relevant literature items to 323. Irrelevant articles (199) were identified based on abstract analysis of the research topic. The number of retrieved full-text articles from citations was 124. The final screening and analysis involved the selection of relevant full-text articles that met the following inclusion criteria, providing a final list of 72 articles for review.

Inclusion Criteria.

1. The article focuses on leadership, communication and project success related to construction, engineering, or project management.
2. The article is peer-reviewed and published in the reputed referred journal.
3. The paper discusses the project manager's leadership and communication practices characteristics related to project success in terms of the title or abstract,
4. The article was published between the years 2000 and 2021.
5. The article is written in English and is available online. Seventy-two articles met the selection criteria and were included in the analysis. Details have been provided in (Table 1)

2.1.3. Step 3: content analysis

Content analysis is a vital step in the systematic review process. A set of relevant articles were identified and selected, meeting our research aims and questions for our study. A simple approach has been followed to highlight, categorize & classify (grading) the leadership practices, behaviours, characteristics, and success factors in the cited articles based on similar approaches taken by other researchers (Ahmed et al., 2020; Jelodar et al., 2016; Snyder, 2019; Zhou et al., 2013) in their publications. Generally, the researchers followed the review process suggested by Snyder (2019) and Zhou et al. (2013), in which the focus was on reading the abstract first and followed by full-text reading to locate research methods, sample sizes and findings. The coding in the articles was mainly focused on the title, keywords, abstract, research methods, sample sizes, and key topic areas for answering our research questions. If required information (for example, research methods and sample sizes) was

Table 1
Summary of cited research Studies.

| Sr No | Researcher/Year | Journal/Publisher | Key Study Purpose | Research Method | Sample size |
|-------|--|--|--|--|-------------|
| 1. | Iqbal et al. (2019) | Journal of Commerce & Social Sciences | Influence of Transformational Leadership | Quantitative Survey and PLC- SEM Analysis | 125 |
| 2. | Rehman et al. (2019) | Asia Pacific Management Review | Investigating leadership Behaviour on outcomes. | Quantitative Survey and Multiple Regression | 757 |
| 3. | Yang et al. (2012) | Quality & Quantity | Leadership Style, Team Interactions on Performance | Quantitative Survey, Regression Analysis | 196 |
| 4. | Chan et al. (2004) | Journal of Construction Engineering Management | Success Factors in Construction | Quantitative Survey and Regression Analysis | 22 |
| 5. | Li et al. (2020) | Journal of Asian Architectural & Building Engineering | Communication and Relationship Factors for Project Success | Quantitative Survey, Smart PLC Analysis | 173 |
| 6. | Kabirifar and Mojtahedi (2019) | Buildings | Engineering and procurement impact on project performance | TOPSIS for Ranking Analysis | 40 |
| 7. | Arnold et al. (2000) | Journal of Organizational Behaviours | Leadership Behaviours & Empowering questionnaire | Survey questionnaire and Regression Analysis | 375 |
| 8. | Aga et al. (2016) | International Journal of Project Management | Transformational Leadership Impact on Project Success | Survey questionnaire and Regression Analysis | 200 |
| 9. | Zuo et al. (2017) | Engineering, Construction & Architectural Management | Soft Skills on Success Factors | Quantitative Survey and SEM Analysis | 108 |
| 10. | Doloi (2009) | Construction Marketing & Economics Journal | Relational Partnerships and communication | Constructive/Interpretivist approach | 97 |
| 11. | Fisher (2011) | International Journal of Project Management | Skills and Behaviours of Project Managers | Interviews and Focus group validation | 19 |
| 12. | Yang et al. (2013) | KSCE Journal of Civil Engineers | Leadership style, communication Impact on Project Success | Quantitative Survey and Confirmatory Analysis | 213 |
| 13. | Guangdong et al. (2017) | International Journal of Project Management | Relationships, Communication & Conflict Factors | Model Analysis | 357 |
| 14. | Tsiga et al. (2016) | PM World Today | Success Factors in construction industry | RII Analysis | 49 |
| 15. | Yong and Mustafa (2013) | Construction, Engineering & Economics | Project Success Factors | Mixed Analysis Method | 48 |
| 16. | Sang et al. (2018) | Sustainability | Project Manager Competency on Green Construction Performance | Confirmatory Factor Analysis, Structural Equation Model | 173 |
| 17. | Gudiene, Banaitis, and Banaitiene (2013) | International Journal of Strategic Property Management | Project Success Factors | RII Analysis | 27 |
| 18. | Simmons et al. (2020) | American Society of Civil Engineers | Leadership Competencies for Construction Professionals | Qualitative Data Collection And Delphi Procedures | 61 |
| 19. | Abdullah et al. (2010) | African Journal of Business Management | Factors influencing Project Success | Birds Eye View - Description | Nil |
| 20. | Cohen et al. (2013) | Project Management Journal | Personality Impact of Project Managers on Project Success | Exploratory Analysis | 280 |
| 21. | Mir and Pinnington (2014) | International Journal of Project Management | Project Management Performance on Project Success | Survey Questionnaire and Regression Analysis | 154 |
| 22. | Hua jin et al. (2012) | International Journal of Construction Management | Critical Factors for Projects | Significance Index Factors Analysis | 67 |
| 23. | Sampaio et al. (2021) | International Journal of Managing Projects in Business | Behavioural Competencies Linked to Project Success | Quantitative Survey, Smart PLS 3.0 regression | 121 |
| 24. | Gruden and Stare (2018) | Project Management Journal | Behavioural Competencies on Project Performance | Quantitative Survey and Multivariant Data Analysis | 70 |
| 25. | Anantatmula (2010) | Engineering Management Journal | Leadership Role, Trust and Communication | The survey questionnaire, Correlation, Regression Analysis | 67 |
| 26. | Jacques et al. (2008) | Managerial Research News | Leadership Behaviours | The Survey Questionnaire and Regression Analysis | 151 |
| 27. | Deep, Gajendran, and Jefferies (2021) | International Journal of Construction Management | A Systematic Review of Enablers of Collaboration | Literature Review | Nil |
| 28. | Hughes and Thorpe (2014) | Construction Innovation | Enabling Productivity Factors | RII Analysis | 89 |
| 29. | Awan et al. (2015) | Journal of Property, Investment and Development | Communication, Team Building Impact on Project Success | The Survey Questionnaire, Regression Analysis | 178 |
| 30. | Babu (2015) | IOSR Journal of Mechanical and Civil Engineering | Factors Affecting Success | The survey questionnaire, RII Analysis | 88 |
| 31. | Raziq et al. (2018) | Leadership & Organization Development Journal | Leadership Style and Goal Clarity And Project Success | SEM Technique | 248 |
| 32. | Bubu (2015) | Journal of Mech and Civil Engineers | Success Factors for Projects | RII Analysis | 88 |
| 33. | Lindhard and Larsen (2016) | Engineering Construction & Architectural Management | Key Factors for Project Success | RII Analysis and SEM Techniques | 87 |
| 34. | Maqbool et al. (2017) | Project Management Journal | EI, Competency Impact on Project Success | The Survey Questionnaire, Correlation, Regression | 359 |
| 35. | Clark (2010) | Project Management Journal | EI, competency, and Transformational Leadership | The Survey Questionnaire, Correlation, Regression | 67 |
| 36. | Belay et al. (2017) | American Journal of Civil Engineering | Major Success Factors on Building Construction | Survey Questionnaire and RII Analysis | 81 |
| 37. | Asgari et al. (2017) | International Journal of Engineering | Success Factors | RII Analysis | 175 |

(continued on next page)

Table 1 (continued)

| Sr No | Researcher/Year | Journal/Publisher | Key Study Purpose | Research Method | Sample size |
|-------|---------------------------------|--|---|--|-------------|
| 38. | Gunduz and Yahya (2018) | Technological and Economic Development of the Economy | Success Factors Identification | RII analysis | 111 |
| 39. | Major and Fotso (2021) | European Journal of Training Development | Leadership Competencies | Integrating Literature Review | Nil |
| 40. | Kuria (2019) | International Journal of Scientific and Engineering Research | Leadership Communication | Literature Review | Nil |
| 41. | Linlin et al. (2017) | International Journal of Construction Engineering & Management | Key Factors impact on Cost performance | SEM Analysis | 147 |
| 42. | Manu et al. (2020) | Engineering Construction & Architectural Management | Project Manager's mindset & Leadership Behaviours | RII Analysis | 92 |
| 43. | Valli & Rajasekaran (2014) | International Journal of Engineering & Applied Sciences | Factors influencing Projects | RII & Parametric Analysis | 96 |
| 44. | Manata et al. (2018) | Journal of Management and Engineering | Key Communication Behaviours | Factors Loading Analysis | 202 |
| 45. | Hassan et al. (2017) | Project Management Journal | Personality Traits and Project Success | Survey questionnaire, Correlation, Regression | 170 |
| 46. | Wang et al. (2021) | Environmental Science and Pollution Research | Investigating the despotic leadership and success | Quantitative Survey | 516 |
| 47. | Brown and Trevino (2006) | Leadership Quarterly | Ethical Leadership | Factor analysis, Smart PLS | Nil |
| 48. | Taylor et al. (2007) | International Journal of Leadership Education | Examination of leadership practices of Principals | Literature Review | 745 |
| 49. | Ahmed et al. (2020) | Engineering Construction & Architectural Management | SLR of project managers' competencies | Univariate Analysis of Variance (ANOVA) | 60 |
| 50. | Guy Major Ngayo Fotso (2021) | European Journal of Training and Development | Leadership Competencies for 21st Century | Literature Review | Nil |
| 51. | Moradi et al. (2020) | Buildings | Project manager's competencies in Collaborative construction | Integrative Literature Review | 24 |
| 52. | Opoku et al. (2014) | Built Environment Project and Asset Management | Leadership styles of UK Sustainability professionals | Quantitative Survey and Qualitative interviews | 15/200 |
| 53. | Butler and Chinowsky (2006) | Journal of Management in Engineering | Emotional Intelligence and Leadership Behaviours | Quantitative (Interviews) and Quantitative Survey | 155 |
| 54. | Muller and Turner (2009) | International Journal of Project Management | Leadership competency profiles of successful PMs | Quantitative Survey and Multivariate Regression | 400 |
| 55. | Alvarenga et al. (2019) | International Journal of Managing Projects in Business | PMs Core Competencies to Project Success | Quantitative Survey and Factor Analysis | 257 |
| 56. | Liphadzi et al. (2015) | Proceeding Engineering | Relationship between Leadership Styles and Project Success | Quantitative Survey, Multivariate Regression | 111 |
| 57. | Afzal et al. (2018) | Marketing and Management of Innovations | PMs' Competencies, EI, and TL Impact on Project Success | Correlation Analysis | 250 |
| 58. | Kissi et al. (2013) | International Journal of Project Management | TL Impact on project performance | Quantitative Survey, Multivariate Regression | 112 |
| 59. | Nauman et al. (2022) | International Journal of Managing Projects in Business | Impact of TL and team building on project success | Quantitative Survey, Factor analysis | 370 |
| 60. | Zhao et al. (2021) | Computational Intelligence and Neuroscience | Impact of TL on PS: A Meta-Analysis Perspective | Quantitative Survey, Multivariate Regression | 31 |
| 61. | Tabassi et al. (2016) | Procedia Engineering | Leadership Behaviour of PS in Sustainable Construction | Meta-analysis of 31 independent studies | 70 |
| 62. | Khan et al. (2020) | International Journal of Managing Projects in Business | Inclusive leadership affect project success | Quantitative Survey and Smart PLS Analysis | 328 |
| 63. | Bagga et al. (2022) | Asia Pacific Management Review | Investigating TL and Change Management in Virtual Teams | Quantitative Survey and SEM approach | 165 |
| 64. | Slattery and Sumner (2016) | Journal of Construction Education and Research | Leadership Characteristics in Construction Project | Quantitative Survey, Factor Analysis, PLS Analysis | 145 |
| 65. | Hashim et al., (2018) | International Journal of Science and Research | Ranking the Most Important Competencies of the PMs | Quantitative Survey, Correlations, and <i>t</i> -test | 94 |
| 66. | Cooke-Davies, (2002) | International Journal of Project Management | The real success factors of projects | Quantitative Survey Method, RII Analysis | 70 |
| 67. | Gardner and Stough (2002) | Leadership & Organization Development Journal | Relationship between leadership and EI for managers | Simple correlation method | 110 |
| 68. | Leung et al. (2005) | Engineering, Construction and Architectural Management, | Relationship between construction conflicts and participants' satisfaction | Quantitative Survey, Correlations, Regression | 75 |
| 69. | Shohet and Frydman (2003) | Journal of Construction Engineering and Management | Communication Patterns in Construction at Construction Manager | Quantitative Survey, Factor analysis and regression | 30 |
| 70. | Tukel and Rom (2001) | International Journal of Operations & Production Management | An empirical investigation of project evaluation criteria. | Structured Interviews questionnaires | 117 |
| 71. | Trivellas and Drimoussis (2013) | Procedia-Social and Behavioural Sciences | Investigating leadership styles, Behaviour and Managerial Competency of Successful Project Managers | Quantitative Survey, Chi-square, <i>t</i> -test for establishing relationships | 97 |
| 72. | Nixon et al. (2012) | International Journal of Productivity and Performance Management | Significance of Leadership performance to project. Success or failure | Quantitative Survey, <i>t</i> -test Factor analysis | 3 |
| | | | | Literature review, Multifactor Questionnaire | |

not found by the authors in the abstracts, the article body, including 'research methodology' and conclusion of a paper, was used to extract the required information for our use. The following key data were extracted from each article (Table 1).

1. Title of the article.
2. Researcher/author name.
3. Publication year.
4. Publishing journal.
5. Research methods used.
6. Key research topic or application area.

3. Analysis of results

Based on an organizing strategy, the pertinent information from relevant publications was abstracted, reviewed, and synthesized, as shown in (Table 1). The following information was abstracted from the relevant articles for our research.

1. Authors/Reference
2. Journal/Publisher/Year
3. Study Purpose
4. Research Methods.
5. Sample Sizes

Several findings came to light in a broader perspective from our cited studies analysis (Table 1).

1. The frequently interchangeable leadership terminologies (such as leadership competencies, styles, skills, and practices) are found in the literature, creating ambiguity in their usage without a defined context.
2. Various research methodologies or approaches are used for data analysis.
3. Varying sample sizes are used in most research studies. The analysis shows variation in chosen sample sizes in the cited research studies. For example, about 14% of articles involved < 50 respondents, and 53% had > 100 respondents in the cited studies.
4. Quantitative surveys, regression analysis, factor analysis and relative importance index (RII) analysis methods were found to be popular among researchers.
5. Few systematic literature reviews are found on leadership sub-topics (e.g., leadership practices, leadership characteristics, leadership behaviours and other such topics)
6. Very few researchers adopted a mixed research approach using quantitative surveys and qualitative evidence of methods to investigate a specific phenomenon. The most published articles on leadership and communication are validating relationships and their impact on project success.

3.1. Critical review of research studies

The authors critically reviewed 35 research studies (Table 2) on leadership behavioural practice characteristics to determine the global frequency of their use in achieving project success. Thirty (30) crucial leadership practice characteristics, namely, (1) *Relationship*, (2) *Motivation*, (3) *Influence*, (4) *Vision*, (5) *Goal Oriented*, (6) *Trust*, (7) *Encouragement*, (8) *Communication*, (9) *Inspire*, (10) *Task-Oriented*, (11) *Team Building*, (12) *Stakeholders*, (13) *Empowerment*, (14) *Commitment*, (15) *Emotional*, (16) *Effective Communication*, (17) *Conflict*, (18) *Management*, (19) *Flexibility*, (20) *Self-Management*, (21) *Coaching*, (22) *Goal Setting*, (23) *Self Awareness*, (24) *Seeking Feedback*, (25) *Sensitivity*, (26) *Leading by Example*,

(27) *Caring Others*, (28) *Empathy*, (29) *Self-Development*, (30) *Humility* were identified and extracted from our extensive literature review studies (Table 1) to create a questionnaire for leadership practices for our extended research project. The questionnaire was developed based on four core independent variables - leadership practices, communication, relationship management, and conflict management with project success as the dependent variable. This questionnaire was used to collect data randomly from Australian project managers in the construction industry for our extended research project.

Our analysis has revealed the most frequently occurring behavioural characteristics (Table 2) used by project leaders globally (RQ3). Synthesizing information on characteristics occurrences in cited studies resulted in the top 10 leadership behavioural practice characteristics, such as Relationships (34), Motivation (31), Influence (31), Vision (30), Goal Oriented (28), trust (25), encouragement (23), Communication (21), Inspire (21), and Task-Oriented (20) and were classified as high valued practice characteristics. The number in the bracket indicates the frequency of occurrence in this set of cited studies. Low-frequency characteristics occurrences in our research study sample, namely, (1) Caring for Others, (2) Leading by Example, (3) Seeking Feedback, (4) Self-Awareness, and (5) Empathy, were identified and classified as low-valued practice characteristics.

3.2. Categorization and grading of leadership behavioural practices characteristics

The behavioural practice characteristics of leadership practices identified in this SLR were grouped into four main clusters and categorized based on our understanding and 35–40 years of practical experience in leadership and communication practices in managing projects: (1) Interpersonal Practices Characteristics, (2) Emotional Practices Characteristics, (3) Tasks Oriented Practices Characteristics and (4) Intellectual Practices Characteristics (Table 3). The researchers invested significant effort into collecting frequency data for these (30) behavioural practice characteristics from each cited study and analyzed them to grade these clusters. The clusters for (set of characteristics) were graded based on (mean) average frequency occurrences in the literature as Interpersonal Practices characteristics (4.54), Emotional Leadership Practices characteristics (3.30), Intellectual Practices characteristics (2.71), and Tasks Oriented Practices characteristics (2.54), respectively (Table 3). The clusters (Table 3) are categorized and graded from (high to low values) based on the mean average frequency usage of behaviour practices as per the equations given below (RQ3). The significance of each cluster has been examined based on the following calculations:

(AOF) Average occurrence frequency for a behaviour's characteristics = Total occurrences/cited journals.

Mean (Average occurrence Frequency) = Sum of AOF for a cluster/No of behaviour characteristics in the cluster.

1. Interpersonal Practices characteristics – High
2. Emotional Practices characteristics – Moderate
3. Task-Oriented Practices characteristics – Low
4. Intellectual Practices characteristics – Low

The analysis of the cited studies demonstrated high to moderate levels of tangible managerial, interpersonal, and emotional behavioural practices to achieve project success, compared to low levels of intellectual and task-oriented behavioural practices on construction projects. The above analysis indicates the project manager's preferred choice of 'leadership behaviour practices' in the construction industry to achieve project success.

A summary of past publications' trends on leadership and

Table 2
Leadership practices characteristics extracted from the examined cited research studies.

| Sr No | Research Studies Characteristics | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|-------|----------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | Relationship | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| 2 | Motivation | √ | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| 3 | Influence | √ | | √ | √ | | √ | √ | | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| 4 | Vision | √ | √ | √ | √ | √ | √ | | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| 5 | Goal Oriented | √ | | √ | √ | √ | √ | √ | | | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| 6 | Trust Building | | √ | √ | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | | | √ | √ |
| 7 | Encouragement | | √ | | √ | | | | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| 8 | Communication | √ | | | | √ | | √ | | √ | | | | | √ | √ | √ | √ | √ |
| 9 | Inspire | √ | √ | √ | | | √ | | | √ | | √ | √ | √ | | √ | √ | √ | √ |
| 10 | Task-Oriented | √ | | | √ | | √ | √ | √ | √ | √ | √ | | √ | √ | | | √ | √ |
| 11 | Team Building | | | | √ | √ | √ | √ | √ | √ | √ | √ | | | | √ | √ | √ | √ |
| 12 | Stakeholders | | √ | | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| 13 | Empowerment | | | | √ | | | | √ | √ | √ | √ | √ | √ | √ | √ | | | √ |
| 14 | Commitment | √ | √ | | √ | | √ | | | √ | √ | √ | √ | | | | | | √ |
| 15 | Emotional | √ | | | √ | | √ | | √ | √ | √ | √ | √ | | √ | | √ | √ | |
| 16 | Effective Communication | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | | | √ |
| 17 | Flexibility | √ | | | | √ | √ | √ | | | √ | √ | √ | √ | √ | | √ | √ | |
| 18 | Conflict Management | | | | √ | √ | √ | | √ | √ | | | | | | √ | | √ | |
| 19 | Self-Management | | | | | | √ | √ | | √ | √ | √ | | √ | √ | | | | √ |
| 20 | Coaching | | √ | | √ | √ | √ | √ | | | | √ | | √ | √ | | √ | | √ |
| 21 | Goal Setting | | | | √ | | √ | | | √ | √ | √ | | | √ | | | | √ |
| 22 | Share Information | | √ | √ | √ | √ | √ | √ | √ | | | √ | | √ | | | | | |
| 23 | Self-Awareness | √ | | | √ | | √ | √ | | | √ | | | | √ | √ | | | √ |
| 24 | Seeking Feedback | | | | | | √ | | | | √ | | | √ | | | | | |
| 25 | Sensitivity | | √ | | √ | | | | | | | √ | | | √ | | | | √ |
| 26 | Leading by Example | | | | | | | | | | √ | √ | √ | √ | | | | | |
| 27 | Caring for Others | | | | | | | | √ | | | √ | √ | √ | | | | | √ |
| 28 | Empathy | | √ | | | | √ | | | | | √ | | | | | | √ | |
| 29 | Self-Development | | | | | | √ | √ | | | | | | | | | | | |
| 30 | Humility | | | | | | | | | | | | | √ | | | | | √ |
| Sr No | Research Studies Characteristics | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | |
| 1 | Relationship | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| 2 | Motivation | √ | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| 3 | Influence | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ |
| 4 | Vision | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ |
| 5 | Goal Oriented | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ |
| 6 | Trust | | | √ | √ | | √ | √ | √ | | √ | | √ | √ | √ | | √ | √ | √ |
| 7 | Encouragement | √ | | √ | | | √ | √ | √ | √ | | √ | √ | √ | √ | | | | √ |
| 8 | Communication | √ | | | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ |
| 9 | Inspire | | √ | √ | √ | | √ | √ | √ | | | √ | √ | √ | √ | | | | √ |
| 10 | Task-Oriented | √ | | √ | | | √ | √ | √ | | | √ | √ | √ | | | | | √ |
| 11 | Team Building | | | | √ | √ | √ | √ | | | | √ | | √ | √ | √ | | | √ |
| 12 | Stakeholders | √ | | | | √ | √ | | | | | √ | | √ | √ | √ | | | √ |
| 13 | Commitment | √ | | √ | | | | √ | √ | | | √ | √ | √ | | | √ | √ | √ |
| 14 | Emotional | | √ | | | √ | √ | | √ | √ | | | √ | √ | √ | | | | √ |
| 15 | Empowerment | √ | | √ | | | √ | √ | √ | √ | √ | | √ | √ | √ | | | | √ |
| 16 | Effective Communication | √ | | | | √ | √ | √ | √ | | | | | | | | | | √ |
| 17 | Flexibility | √ | | | | √ | | | | √ | | | √ | √ | | √ | | | √ |
| 18 | Conflict Management | √ | | | | | √ | √ | √ | | | √ | | √ | √ | √ | √ | √ | √ |
| 19 | Self-Management | √ | | √ | | | √ | √ | √ | | √ | | | | √ | | | | √ |
| 20 | Coaching | | | √ | | | | | | | | | √ | | √ | | | | √ |
| 21 | Goal Setting | | | √ | | | | √ | | | | | √ | √ | √ | | √ | | √ |
| 22 | Share Information | | | | | | | | | | | √ | | | √ | | √ | | √ |
| 23 | Self-Awareness | √ | | | | | | | | | | | | √ | | | | | √ |
| 24 | Seeking Feedback | √ | | | | √ | | √ | | | | | √ | | | | | | √ |
| 25 | Sensitivity | √ | | | | | | | | | | | | | | | | | √ |
| 26 | Leading by Example | | | | | | | | | | √ | √ | | √ | | | | | √ |
| 27 | Caring Others | | | | | | | | √ | | | | | | | | | | √ |
| 28 | Empathy | | | | | | | √ | | | | | | | | | | | √ |
| 29 | Self-Development | √ | | | | | | | | | | | √ | √ | | | | | √ |
| 30 | Humility | | | | | | | √ | | | | | | √ | | | | | √ |

communication dimensions is compiled (Fig. 1), indicating the level of interest for researchers and academics (an increasing trend on average in Fig. 1) - (RQ2). This upward trend continues to rise as leadership gains interest in project management research, and researchers and practitioners view it as an essential factor in influencing others to work effectively to achieve project objectives. Research in leadership continues to evolve to explore new perspectives and approaches to understanding the role of leadership behavioural practices, dimensions, and communication in changing complex project environments.

Most literature on project-based leadership studies has focused primarily on styles, perspectives, skills, competencies, and leadership practices' and found inconsistencies. No specific style or leadership behaviour has been specified to be perfectly applicable to all projects; however, leadership behaviours/practices with strategic thinking and styles have been advocated to achieve successful project outcomes in the industry (Opoku et al., 2014). The significance of project characteristics in determining leadership behaviours' effectiveness is also related to project success. For example, some studies have found leadership effectiveness in team building and promoting collaborative relationships, while few others championed the leadership competency's contribution to project success. Project characteristics, leadership behaviours, competencies, and effectiveness in project management are the main factors contributing to project success.

In addition, several researchers have explored the subject of effective communication and its impact on project success. Shohet and Frydman (2003, p. 575) stated that effective communication is a core competency, especially considering the pivotal role of project managers. Clarke (1999, pp. 139–145) says, "Effective communication can motivate, reduce non-productive efforts, avoid mistakes, manage uncertainties, encourage teamwork, and build confidence". Project communication practices positively impact project success and influence trust in the team environment, impacting project success. Poorly managed processes could lead to a demotivated workforce, project delay, and even failure to meet objectives. Some studies have focused on leadership communication visibility (communication practices, connections, channels, and content) in the projects, as it can contribute to building trust through communication leading to project success (Doloi, 2009; Aubert et al., 2013; Khanyile et al., 2019). In addition, three communication practices: (1) information and communication technology, (2) communication management plan, and (3) clear channels were identified to be directly related to project success in one of the research projects undertaken (Khanyile et al., 2019).

4. Results and discussion

In the past, researchers have undertaken reviews on project managers' leadership skills, competencies, styles, performance and their relationships with project success in construction projects (Ismail & Fathi, 2018; Liridon et al., 2017; Nixon et al., 2012; Muller & Turner, 2007; Toor & Ofori, 2008; Turner & Müller, 2005); however, this SLR has concentrated on exploring leadership behavioural practices characteristics, following SLR methods and approaches based on empirical studies in the literature. The current

SLR study has provided a unified summarised effort on leadership and communication leading to project success. Numerous scholarly papers on project managers' leadership and communication behaviour practices and related skillsets studies have been reviewed. Broadly, leadership can be summarised in various inter-related concepts/components: leadership practices dimensions, personal characteristics, leadership style, personality traits, competencies and skills, and situational theories. Our analysis of the cited studies demonstrated high to moderate levels of tangible managerial interpersonal practice dimensions and emotional practices compared to low levels of intellectual and task-oriented practice dimensions on construction projects to achieve project success (Table 3). Behavioural practices characteristics such as relationship, empowerment, conflict management, effective communication, coaching, sharing information, seeking information, stakeholders' management, motivation, influence, inspiration, self-awareness, emotions, sensitivity, empathy, humility, and encouragement are commonly used for establishing and validating relationships with project success in the literature. The synthesizing of information identified people-oriented and relationship-building project leaders using effective leadership and communication and collaborative working are highly valued compared to task-oriented project leaders on successful construction projects. These characteristics are highlighted and highly valued to handle changing business environments and complexity in project management using interpersonal effectiveness, developing relationships, agility, and flexibility in their leadership style to work in the digitalized and BANI environment.

As a significant outcome of this SLR, it is concluded that project success is directly or indirectly influenced by the project manager's leadership behaviours & communication dimensions in one way or another. No specific style or leadership behaviours/practices have been identified that can be applied in all situations for most types of projects. Emotional Intelligence is another significant element that needs to be included in defining leadership behaviours (Geoghegan & Dulewicz, 2008; Goleman, 2003). Relationship skill is another essential component of project management that complements the effectiveness of leadership practices (Meng, 2012). The project characteristics significantly impact the effectiveness of leadership behaviours and their relationship with project success. Project managers' characteristics like developing trust, emotional Intelligence, collaboration, teamwork, promoting cooperating relationships, and influencing the team have been identified to impact project performance (Doloi, 2009; Raziq et al., 2018).

Effective communication and its processes have been found to impact the project's success directly. Characteristics like trust, cooperating relationships, teamwork, leading by example, and influencing the project environment have been identified to ensure successful communication, impacting project success (Anantmula, 2010).

4.1. Leadership in sustainable development

We are witnessing a rapid change due to the digital revolution affecting how we live, work, and relate to one another. The exponential increase in computing power, quality data management,

Researchers/Authors: 1-Butler and Chinowsky (2006); 2-Clarke (2010); 3-Anantmula (2010); 4-Ahmed et al. (2020); 5-Belzer (2001); 6-Major and Fotso (2021); 7-Trivellas and Drimoussis (2013); 8-Wang et al. (2021); 9-Raziq et al. (2018); 10-Nixon et al. (2012); 11-Opoku et al. (2014); 12-Arnold et al. (2000); 13-Manu et al. (2020); 14-Muller and Turner (2009); 15-Jacques et al. (2008); 16-Xue et al., 2020, p. 17-Maqbool et al. (2017); 18-Taylor et al. (2007); 19-Alvarenga et al. (2019); 20-Belay et al. (2017); 21-Liphadzi et al. (2015); 22-Yang et al. (2012); 23-Awan et al. (2015); 24-Afzal et al. (2018); 25-Nauman et al. (2022); 26-Zhao et al. (2021); 27-Tabassi et al. (2016); 28-Khan et al. (2020); 29-Chileshe and Ali (2009); 30-Iqbal et al. (2019); 31-Slattery and Sumner (2016); 32-Aga et al. (2016); 33-Hashim et al. (2018); 34-Lindhard and Larsen (2016); 35-Zuo et al. (2017).

Table 3
Categorization of leadership behaviour characteristics in clusters.

| Interpersonal Practices Characteristics | Emotional Practices Characteristics | Task-Oriented Practices Characteristics | Intellectual Practices Characteristics |
|---|-------------------------------------|---|--|
| Relationship | Motivate/Motivational | Team Building | Self-Management |
| Empowerment | Influence | Goal Setting | Self-Development |
| Conflict Management | Inspire/Inspirational | Goal Oriented | Vision |
| Stakeholders | Self-awareness | Leading by Example | |
| Effective Communication | Emotions/Emotional | Flexibility | |
| Communication | Sensitivity | Commitment | |
| Share information | Empathy | Task-Oriented | |
| Coaching | Humility | | |
| Seeking Feedback | Caring for Others | | |
| Trust Building | Encouragement | | |

and the penetration of artificial intelligence (AI) are some online platforms impacting and changing organizational culture. As a consequence, new forms of collaboration and organizations are evolving. This is why leadership and coaching skills have become more critical than ever for the sustainable success of organizations. Organizational leadership knows that leadership skills must change rapidly and substantially to keep up with technology. Among the challenges and newly required skills arising from this situation are the stimulation of network dynamics, openness towards stakeholder issues, motivation through personal appreciation, self-determination, the meaningfulness of shared working experience, and both supporting and supervising cooperation in decentralized teams that can easily adapt to multiple tasks (Lohrmann, 2017). How we interact is changing and becoming more integrated and comprehensive, involving all stakeholders. Organizations, therefore, need to develop leaders at three levels: personal, team and organization. Two aspects, (1) Character and (2) Competence needs to be considered in these changing environments (Covey, 2017). Leaders can be examples of personal effectiveness, building trust, motivating team members to set goals to achieve success and increasing their circle of influence. According to Covey (2004, 2008), there are four principles (inspiring trust, purpose clarification, aligning the systems, and unleashing the leadership talent that must be followed to perform in this digital and sustainable world. In addition to leadership skills, coaching as a means to lead, guide, support, motivate and inspire people in a digital world is becoming ever more critical in the contemporary world (Simpson, 2014, p. 2) cited in (Lohrmann, 2017). Leadership has the strategic priority and needs to enhance resilience among people and systems to enable them to face challenges. More than ever, it is essential for project leaders to motivate people to build a network to become effective and productive employees in the digital work

environment and unleash their talents. This implies that managers must evolve into effective leaders who can coach and guide their teams and, eventually, the whole organization (Goldsmith, cited in Simpson, 2014, p. 3). Greater internal and external networking will help an organization to deal better with the changing circumstances.

5. Theoretical and practical contributions

1. Our study makes an important theoretical contribution in providing a unified summarised effort of understanding leadership behavioural practices (including new findings in the cited literature), helping us better understand variables/factors linkages of project managers' leadership behavioural practices with project success. In carrying out this review, we have addressed the research calls to explore further leadership practices' understanding to achieve project success (Gruden & Stare, 2018; Stevenson & Starkweather, 2010)
2. We have significantly contributed by categorising different leadership behavioural practice characteristics into four characteristic clusters, assisting project managers in successfully managing projects. The authors identified high to moderate levels of interpersonal and emotional practice behavioural characteristics for successful construction projects. The authors identified highly valued top 10 leadership practice characteristics with the most occurrences in the critically reviewed research studies for project managers. Additionally, people-oriented and relationship-building project leaders are identified as highly valued professionals compared to task-oriented project leaders on successful construction projects.
3. Practical implications include motivating project managers to use a set of leadership practice behavioural characteristics in the

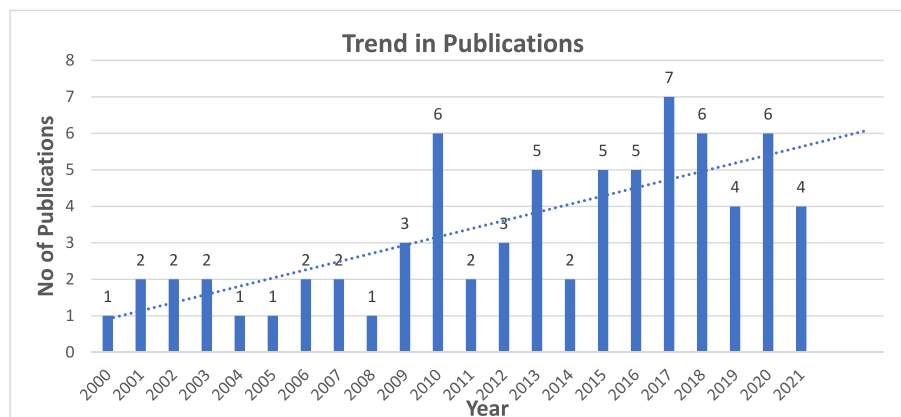


Fig. 1. Summary of publications and current trends from SLR



Fig. 2. Leadership practices characteristics occurrences in 35 cited research studies.

identified cluster/s required to achieve project success. Additionally, project-based organizations can organize training programs and seminars to improve and enhance their project management professionals' leadership practices and behavioural skills before assigning them to a specific project. In addition, organizations can use our identified cluster listings of behavioural practice characteristics during their recruitment process of project professionals. Our approach and investigation of leadership practices will add value to the existing body of knowledge in the leadership and project management domain, ultimately providing practitioners with a boost in improving their ability to achieve project success.

4. The paper has additionally discussed the ongoing implications and influence of the paradigm shift from the VUCA to the BANI environment and the likely challenges faced by the leaders and organizations in the digitized world. This discussion will motivate future researchers and provide directions for further investigations in this area.

6. Conclusion

Leadership is a dynamic behaviour that makes leaders effective, and its role and practices vary with different project network requirements, circumstances, and external factors. Consequently, no ultimate leadership behaviours/practices exist. The ongoing debate in leadership persists due to frequent project failures worldwide (Aziz & Hafez, 2013; Anantatmula, 2010). Project leaders are constantly working to minimize project failures by adopting new leadership practices and strategies to enhance project success in the construction sector. The research in the leadership field continues to evolve to explore new perspectives and approaches to understanding the role of leadership behavioural practices and

communication in achieving project success. This study contributes to the literature to improve understanding of the leadership behavioural practices achieving project success and provide a benchmark for further investigations in future. This SLR has indicated that characteristics of interpersonal behavioural practices are highly valued by successful project managers who work to create a collaborative project environment using effective communication compared to task-oriented project managers in the construction industry. Relationship-building and people-oriented project leaders emphasize their focus on building trust among team members, using open, honest, and effective communication, and providing empowerment and support to the project team to achieve project success. Another find from our analysis found soft skills such as (caring for others, self-awareness, empathy, sensitivity, inspiration, and vision) for project managers are less valued (Fig. 2) compared to the highly valued 'leadership practices' (such as relationships, motivation, inspiration, influence, communication, goal-oriented, vision, trust, stakeholder management, team-building, and encouragement) used by people-oriented and relationship-building practitioners on successful construction projects. The low-valued soft skills identified in our analysis are still crucial in construction management and need further investigation for successful project management.

There is a pressing need for improved leadership practices, especially in the increasing adoption of developing technologies, such as building information modelling (BIM), Artificial Intelligence, drones, mobile technology, robotics, virtual prototyping, change management, etc. Artificial Intelligence (AI), in particular, is making significant strides and revolutionizing the project management industry by automating mundane tasks, facilitating data-driven decisions, and boosting team collaboration. It empowers project leaders to focus on strategic aspects, leading to an uplift in overall project results. AI will significantly influence the

organization's working environment, including its leaders and leadership. Managing organizational change is a continuous process for every business organization (Islam et al., 2021). Leaders would be confronted with significant challenges of change management, strategic transformation process, new qualifications and competencies requirements, knowledge of quality data management and organizational cultural change management (Peifer et al., 2022). The supporting behaviour of leaders would be a crucial element for implementing AI successfully in the organization to achieve the benefits of uplifting the efficiency and effectiveness of the processes. The changing project and technical complexity will require enhanced leadership practices and communication behaviours across engineering projects to realize benefits from new techniques and technologies. Enhanced project leadership practices (including challenging yourself continuously) will help improve group consistency and mutual understanding and encourage open discussion and logical perception through project teams. Our findings from this SLR would help project professionals develop future industry leaders helping society economically and professionally.

7. Limitations/future directions

The findings from this SLR will motivate researchers to further investigate other specific areas of project management to generalize our results and trends in the industry. The consolidated literature information in this paper will generate opportunities for researchers and practitioners to study the subject further in other engineering sectors on a broader scale to understand better leadership and communication behaviour patterns, principles, and paradigms and investigate leadership insights of leadership behavioural practices by conducting face-to-face interviews with practitioners and making the results more credible by conducting triangulation analysis. The majority of cited studies in our review rely on cross-sectional research designs for construction projects, and future researchers can initiate engineering project-based investigations on longitudinal timelines to accurately model the behavioural characteristics interactions between leadership and project success. Project managers' leadership behaviour practices depend on culture, principles, demographics, and the surrounding environment; there is a need to extend the SLR studies to other developing countries to enable a comparative analysis of practice behavioural characteristics that lead to project success in different environments. Another limitation of this SLR was in reviewing the limited number of cited studies based on mixed sample sizes (small to large) and using English language research papers only.

Further, despite our best efforts, the researchers might have missed a few essential publications on the relevant topic. Future researchers can address this limitation by expanding their studies based on larger sample sizes and articles from other languages. They could even extend to include additional databases to get more credible results. Our discussion on the digitized/BANI work environment will motivate future researchers to investigate leadership-changing requirements further to counter these challenges in achieving project success.

Authors' statements

The authors take responsibility for certifying that this paper has not been published in any journal or presented at any conference or seminar before.

This research did not receive any specific grant from any funding agency.

Declaration of competing interest

The authors have no conflict of interest.

References

- Abdullah, A. A., Rahman, H. A., Harun, Z., Alashwal, A. M., & Beksin, A. M. (2010). Literature mapping: A bird's eye view on classification of factors influencing project success. *African Journal of Business Management*, 4(19), 4174–4182.
- Afzal, A., Khan, M., & Mujtaba, B. (2018). The impact of project managers competencies, Emotional Intelligence, and transformational leadership on project success in the information technology sector. *Marketing and Management of Innovations*, (2)<https://doi.org/10.21272/mmi.2018.2-12>
- Aga, D. A., Noorderhaven, N., & Vallejo, B. (2016). Transformational leadership and project success; the mediating role of team building. *International Journal of Project Management*, 34, 806–818.
- Ahmed, R., Philbin, S. P., & Cheema, F. A. (2020). Systematic literature review of project manager's leadership competencies. *Engineering Construction and Architectural Management*, 28(1), 1–30.
- Alvarenga, J. C., Branco, R., Guedes, A., Soares, C. A., & Silva, W. S. (2019). The project manager's core competencies to project success. *International Journal of Managing Projects in Business*, 13(2), 277–292.
- Anantamula, V. (2010). Project manager's leadership role in improving project performance. *Engineering Management Journal*, 22(1), 13–22.
- Arnold, J., Arad, S., Rhoades, J., & Drasgow, A. F. (2000). The empowering leadership questionnaire: The construction and validation of a new scale for measuring leader behaviours. *Journal of Organizational Behavior*, 21, 249–269.
- Asgari, M., Kheyroddin, A., & Naderpour, H. (2017). Evaluation of project critical success factors for key construction players and objectives. *International Journal of Engineering*, 31(2), 228–240.
- Aubert, B., Hooper, V., & Schnepel, A. (2013). Revisiting the role of communication quality in ERP project success. *American Journal of Business*, 28(1), 64–85.
- Awan, M. H., Ahed, K., & Zulqarnain, W. (2015). Impact of project managers soft leadership skills on project success. *Journal of Poverty, Investment and Development*, 8, 2015.
- Aziz, R. F., & Hafez, S. M. (2013). Applying lean thinking in construction and performance improvement. *Alexandria Engineering Journal*, 52(4), 679–695.
- Babu, N. J. (2015). Factors affecting success of construction project. *IOSR Journal of Mechanical and Civil Engineering*, 12(2), 17–26.
- Bagga, S. K., Gera, S., & Haque, S. N. (2022). The mediating role of organizational culture: Transformational leadership and change management in virtual teams. *Asia Pacific Management Review*, 1029–1312. <https://doi.org/10.1016/j.amprv.2022.07.003>. Elsevier's.
- Bass, M., & Avolio, B. (2000). *MLQ Multifactor leadership questionnaire* (2nd ed.). Redwood City, CA: Mind Garden.
- Belay, M. D., Tekeste, E. A., & Ambo, S. A. (2017). Investigation of major success factors on building construction projects management system in Addis Ababa, Ethiopia. *American Journal of Civil Engineering*, 5(3), 155–163.
- Belzer, K. (2001). "Project management: Still more art than science-A paper". <http://www.pmforum.org/library/papers/2001/Artthan Science.pdf>.
- Brown, M. E., & Trevino, K. L. (2006). Ethical leadership: A review and future directions. *The Leadership Quarterly*, 17(2006), 595–616.
- Butler, C., & Chinowsky, P. S. (2006). Emotional intelligence and leadership behaviour in construction executives. *Journal of Management in Engineering*, 22, 119–125.
- Chan, A., Scott, D., & Chan, A. P. L. (2004). Factors affecting the success of a construction project. *Journal of Construction Engineering and Management*, 130(1), 153–155.
- Chileshe, N., & Ali, M. (2009). The influence of the project manager on the success of the construction project. *Global Convergence in construction management at Jeju. Korea* <https://www.researchgate.net/publication/265689336>.
- Clarke, A. (1999). A practical use of key success factors to improve the effectiveness of project management. *International Journal of Project Management*, 17(3), 139–145.
- Clarke, N. (2010). Emotional intelligence and its relationship to transformational leadership and key project competencies. *Project Management Journal*, 41(2), 5–20.
- Cohen, Y., Ornoy, H., & Keren, B. (2013). MBTI personality types of project managers and their success: A field survey. *Project Management Journal*, 44(3), 78–87.
- Cooke-Davis, T. (2002). The real success factors on projects. *International Journal of Project Management*, 20, 185–190.
- Covey, S. R. (2004). *The 7 habits of highly effective people*. New York: Simon Schuster.
- Covey, S. R. (2008). *The speed of trust*. New York: Simon Schuster.
- Covey, S. R. (2017). *The leader formula: The 4 things that make a good leader*. <http://www.stephencovey.com/blog/p=6>. (Accessed 6 January 2017).
- De Araujo, M. C. B., Alencar, L. H., & de Miranda, C. M. (2017). Project procurement management: A structured literature review. *International Journal of Project Management*, 35(3), 353–377.
- Deep, S., Gajendran, T., & Jefferies, M. (2021). A systematic review of 'enablers of collaboration' among the participants in construction projects. *International Journal of Construction Management*, 21(9), 919–931.
- Doloi, H. (2009). Relational partnerships: The importance of communication, trust and confidence and joint risk management in achieving project success.

- Construction Management & Economics*, 27(11), 1099–1109.
- Fisher, E. (2011). What practitioners consider to be the skills and behaviours of an effective people project manager. *International Journal of Project Management*, 29(8), 994–1002.
- Gardner, L., & Stough, C. (2002). Examining the relationship between leadership and emotional intelligence in senior-level managers. *The Leadership & Organization Development Journal*, 23(2), 68–78.
- Geoghegan, L., & Dulewicz, V. (2008). Do project managers' leadership competencies contribute to project success. *Project Management Journal*, 39(4), 58–67.
- Goleman, D. (2003). *Working with emotional intelligence*. Business and Economics: Bantam Books.
- Gruden, N., & Stare, A. (2018). The influence of behavioural competencies on project performance". *Project Management Journal*, 49(3), 98–109.
- Guangdong, W., Liu, C., Zhao, X., & Zuo, J. (2017). Investigating the relationship between communication -conflict interaction and project success among construction project teams. *International Journal of Project Management*, 35(2017), 1466–1482.
- Gudiene, N., Banaitis, A., & Banaitiene, N. (2013). Evaluation of critical success factors for construction projects – an Empirical Study in Lithuania. *International Journal of Strategic Property Management*, 17(1), 21–31. <https://doi.org/10.3846/1648715X.2013.787128>
- Gunduz, M., & Yahya, A. M. A. (2018). Analysis of project success factors in construction industry. *Technological and Economic Development of Economy*, 24(1), 67–80.
- Hashim, E., Binti, A., Yusof, M., & Alamen, K. M. (2018). An integrated model of project managers competencies through factor analysis. *International Journal of Innovative Science and Research Technology*, 3(12), 335–342.
- Hassan, M. M., Bashir, S., & Abbas, S. M. (2017). The impact of project managers' personality on project success in NGOs: The mediating role of transformational leadership. *Project Management Journal*, 48, 74–87. <https://doi.org/10.1177/875697281704800206>
- Hua Jin, X., Tan, H. C., Zuo, J., & Feng, Y. (2012). Exploring critical success factors for developing infrastructure projects in Malaysia-main contractors perspective. *The Journal of Construction Management*, 12(3), 25–41.
- Hughes, R., & Thorpe, D. (2014). A review of enabling factors in construction industry productivity in an Australian environment. *Construction Innovation*, 14(2), 210–228.
- Iqbal, S. M. J., Zaman, U., & Siddiqui, S. H. (2019). Influence of transformational leadership factors on project success. *Journal of Commerce and Social Sciences*, 13(1), 231–256.
- Islam, N., Furuoka, F., & Idris, A. (2021). Mapping the relationship between transformational leadership, trust in leadership and employee championing behaviour during organizational change. *Asia Pacific Management Review*, 26(2), 95–102.
- Ismail, M., & Fathi, M. S. (2018). Leadership in construction: Leadership styles practiced in construction project – a review. *Journal of Advanced Research in Business and Management Studies*, 13(1), 24–30.
- Jacques, P. H., Garger, J., & Thomas, M. (2008). Assessing leader behaviours in project managers. *Management Research News*, 31(3), 4–11.
- Jelodar, M. B., Yiu, T. W., & Wilkinson, S. (2016). A conceptualization of relationship quality in construction procurement. *International Journal of Project Management*, 34(6), 997–1011.
- Kabirifar, K., & Mojtahedi, M. (2019). The impact of engineering, procurement and construction (EPC) phases on project performance: A case of large-scale residential construction project. *Buildings*, 9(1), 15. <https://doi.org/10.3390/buildings9010015>, 2019.
- Khan, Z., Jaafar, M., Javed, B., Mubarak, N., & Saudagar, T. (2020). Does inclusive leadership affect project success? The mediating role of perceived psychological empowerment. *International Journal of Managing Projects in Business*, 13(5), 1077–1096.
- Khanyile, N., Musonda, I., & Agumba, J. (2019). Evaluating the relationship between communication management practices and project outcomes- a case study of Eswatini (Swaziland) construction industry, *Construction Economics and Building*. UTS e-press, 19(2).
- Kissi, J., Dainty, A., & Tuuli, M. (2013). Examining the role of transformational leadership of portfolio managers in project performance. *International Journal of Project Management*, 31(4), 485–497.
- Kuria, G. N. (2019). Literature review: Leaders communication styles and work outcomes. *International Journal of Scientific Engineering and Research*, 10(1), 1956–1965. ISSN 2229-5518.
- Leung, M., Liu, A. M. M., & Ng, S. T. (2005). Is there a relationship between construction conflicts and participants' satisfaction? *Engineering, Construction and Architectural Management*, 12(2), 149–167.
- Li, X., Yin, Y., & Zhang, R. (2020). Examining the impact of relationship-related and process-related factors on project success: the paradigm of stimulus-organism-response. *Journal of Asian Architecture and Building Engineering*. <https://doi.org/10.1080/13467581.2020.1828090>
- Lindhard, S., & Larsen, J. K. (2016). Identifying the key process factors affecting project performance. *Engineering Construction and Architectural Management*, 23(5), 667–673.
- Linlin, Z., Mbachau, J., & Niluka, D. (2017). A better modelling and assessment of key factors affecting cost performance of building projects: A case study New Zealand. *International Journal of Construction Engineering and Management*, 6(15), 187–196.
- Liphadzi, M., Aigbavboa, C., & Thwala, W. (2015). Relationship between leadership styles and project success in the South Africa construction industry. *Procedia Engineering*, 123, 284–290.
- Liridon, V., Manxhari, M., Demiri, V., & Jahaj, L. (2017). The influence of leadership styles on employees performance. *Management*, 31(2), 16487974.
- Lohrmann, C., & Osburg, T. (2017). Leadership in a digital world: New ways of leadership for sustainable development. In *Sustainability in a digital world*. Springer International Publishing AG 2017. <https://doi.org/10.1007/978-3-319-54603-2>.
- Major, G., & Fotso, N. (2021). Leadership competency for the 21st century: A review from the western world literature. *European Journal of Training and Development*, 45(6/7), 566–587.
- Manata, B., Miller, V., Mollaoglu, S., & Gracia, A. J. (2018). Measuring key communication behaviour in integrated project delivery teams. *Journal of Management in Engineering*, 34(4), Article 06018001.
- Mantel, J. Jr., Meredith, J. R., Shafer, S. M., & Sutton, M. M. (2004). *Core concepts: Project management in practice (with CD)* (2nd ed.). New York: John Wiley and Sons, 2004.
- Manu, D. G. O., Debrah, C., Amisah, L., Edwards, D. J., & Chileshe, N. (2020). Exploring the Linkages between project managers mindset behaviour and project leadership style in the Ghanaian construction industry. *Engineering Construction and Architectural Management Journal*, 3(1), 969–988.
- Maqbool, R., Sudong, Y., Manzoor, N., & Rashid, Y. (2017). The impact of emotional intelligence, project managers' competencies, and transformational leadership on project success: An empirical perspective". *Project Management Journal*, 48(3), 58–75.
- Meng, X. (2012). The effect of relationship management on project performance in construction. *International Journal of Project Management*, 30, 88–198.
- Mir, F. A., & Pinnington, A. H. (2014). Exploring the value of project management; linking project management performance and project success. *International Journal of Project Management*, 32(2014), 202–217.
- Moradi, S., Kahkonen, K., & Aaltonen, K. (2020). Project managers' competencies in collaborative construction projects. *Buildings*, 10(50). <https://doi.org/10.3390/buildings10030050>
- Müller, R., Gerdali, J., & Turner, J. R. (2012). Relationships between leadership and success in different types of project complexities. *IEEE Transactions on Engineering Management*, 59(1), 77–90.
- Muller, R., & Turner, J. (2007). Matching the project manager's leadership style to project type. *International Journal of Project Management*, 25(1), 21–32.
- Muller, R., & Turner, J. (2009). Leadership competency profiles of successful project managers. *International Journal of Project Management*, 28, 437–448.
- Nauman, S. N., Musawir, A. U., Munir, H., & Rasheed, I. (2022). Enhancing the impact of transformational leadership and team building on project success: The moderating role of empowerment climate. *International Journal of Managing Projects in Business*, 15(2), 423–443.
- Nixon, P., Harrington, M., & Parker, D. (2012). Leadership performance is significant to project success or failure: A critical analysis. *International Journal of Productivity and Performance Management*, 61(2), 204–216.
- Ogunlana, S. (2011). Factors and procedures in large construction projects in Vietnam. *Engineering Construction and Architectural Management*, 15(2), 7–99.
- Opoku, A., Ahmed, V., & Cruickshank, H. (2014). Leadership style of Sustainability professionals in the U.K. construction industry. *Built Environment Project and Asset Management*, 5(2), 184–201.
- Padalkar, M., & Gopinath, S. (2016). Six decades of project management research: Thematic trends and future opportunities. *International Journal of Project Management*, 34, 1305–1321.
- Peifer, Y., Jeske, T., & Hille, S. (2022). *Artificial intelligence and its impact on leaders and leadership* (pp. 1024–1030). Procedia Computer Science, 20092022.
- Pinto, J. K., & Slevin, D. P. (1988a). Project success: Definition and measurement techniques. *Project Management Journal*, 19(1), 67–71.
- Rajasekaran, A. G., & Valli, P. (2014). Analysis of the success factors influencing in construction project. *International Journal of Engineering and Applied Sciences*, 6(3), 21–36, 2014.
- Ray, S. K. S. (2023). Moving towards agile leadership to help organizations succeed. *The IUP Journal of Soft Skills*, 17(1), 2023.
- Raziq, M. M., Borini, F. M., Malik, O. F., Ahmad, M., & Shabaz, M. (2018). Leadership styles, goal clarity, and project success. *The Leadership & Organization Development Journal*, 39(2), 309–323.
- Rehman, S. U., Shahzad, M., Farooq, M. S., & Javid, M. U. (2019). Impact of leadership behaviour of a project manager on his/her subordinate job-attitudes and job outcomes. *Asia Pacific Review Journal*, 1029–3132, 10.1016.
- Sampaio, S., Wu, Q., Cormican, K., & Varajao, J. (2021). Reach for the sky: Analysis of behavioural competencies linked to project success. *International Journal of Managing Projects in Business*, 15(1), 192–215.
- Sang, P., Liu, J., Zhang, L., Zheng, L., Yao, H., & Wang, Y. (2018). Effects of project manager competency on green construction performance: The Chinese context. *Sustainability*, 10(10), 3406.
- Shohet, I. M., & Frydman, S. (2003). Communication patterns in construction at construction manager level. *Journal of Construction Engineering and Management*, 129(5), 570–577.
- Simmons, D. R., McCall, C., & Nicholas, A. C. (2020). *Leadership competencies for construction professionals as identified by construction industry executives*. American Society of Civil Engineers. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0001903](https://doi.org/10.1061/(ASCE)CO.1943-7862.0001903)
- Simpson, M. (2014). *Unlocking potential, 7 skills that transform individuals, teams and organizations*. Grand Haven, MI: Grand Harbor Press.

- Slattery, D. K., & Sumner, M. R. (2016). Leadership characteristics of rising stars in construction project management. *International Journal of Construction Education and Research*, 7(3), 159–174.
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333–339. <https://doi.org/10.1016/j.jbusres.2019.07.039>
- Stevenson, D. H., & Starkweather, J. A. (2010). PM critical competency index: IT execs prefer soft skills. *International Journal of Project Management*, 28(7), 663–671.
- Strang, K. D. (2007). Examining effective technology project leadership traits and behaviours, 2004. *Computers in Human Behavior*, 23, 424–462.
- Tabassi, A. A., Roufechaei, K. M., Ramli, M., Bakar, H. A., & Pakir, H. K. (2016). Leadership competencies of sustainable construction project managers. *Journal of Cleaner Production*, 339–349.
- Taylor, T., Martin, B., Hutchinson, S., & Jinks, M. (2007). Examination of leadership practices of principals identified as servant leaders. *International Journal of Leadership in Education*, 10(4), 401–419.
- Thorpe, R., Holt, R., Macpherson, A., & Pittaway, L. (2005). Using knowledge within small and medium-sized firms: A systematic review of the evidence. *International Journal of Management Reviews*, 7(4), 257–281.
- Toor, S., & Ofori, G. (2008). Taking leadership research into future. *Engineering Construction and Architectural Management*, 15(4), 352–371.
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge using a systematic review. *British Journal of Management*, 14(3), 207–222.
- Trivellas, P., & Drimoussis, C. (2013). Investigating leadership styles, behaviour and managerial competency profiles of successful project managers in Greece. *Procedia-Social and Behavioural Sciences*, 73, 692–700.
- Tukel, I., & Rom, O. (2001). An empirical investigation of project evaluation criteria. *International Journal of Production Management*, 21(3), 400–416.
- Tunji, J. (2022). *Trust: An essential factor for effective leadership and development of an exemplary organization*. Academia Letters.
- Turner, R., & Müller, R. (2005). The project manager's leadership styles as a success factor on projects: A literature review. *Project Management Journal*, 36(2), 49–61.
- Wang, N. (2014). Deepen the reform to promote engineering project management innovation. *Construction Architect*, 21, 8–12.
- Wang, B., Rasool, S. F., Zhao, Y., Samma, M., & Iqbal, J. (2021). Investigating the nexus between critical success factors, despotic leadership, and success of renewable energy projects. *Environmental Science and Pollution Research*, 29, 10388–10398.
- Weed, M. (2005). Meta interpretation: A method for the interpretive synthesis of a qualitative research paper presented at the *qualitative sozialforschung/forum*. *Qualitative Social Research*, 6, 1–17.
- Xiao, Y., Liu, J., & Pang, Y. (2019). Development of a competency model for real-estate project managers: A case study of China. *International Journal of Construction Management*, 19(4), 317–328. <https://doi.org/10.1080/15623599.2018.1435237>
- Xue, J., Rasool, Z., Gillani, A., & Khan, A. I. (2020). The impact of project manager soft competencies on project sustainability. *Sustainability*, 12(16), 6537. <https://doi.org/10.3390/su12166537>
- Yang, L. R., Wu, K. S., & Huang, C. F. (2013). Validation of a model measuring the effect of a project manager's leadership style on project performance. *KSCIE Journal of Civil Engineering*, 17(2), 271–280.
- Yang, L. R., Wu, K. S., & Wang, F. K. (2012). Relationships among project manager's leadership style, team interaction and project performance in the Taiwanese server industry. *Springer Science Business Media, Quality & Quantity*, 46(1), 207–219.
- Yong, Y. C., & Mustafa, N. E. (2013). Critical success factors for Malaysian construction projects: An empirical assessment. *Construction Management & Economics*, 31(9), 959–978. <https://doi.org/10.1080/01446193.2013.828843>
- Zhao, N., Fan, D., & Chen, Y. (2021). *Understanding the impact of transformational leadership on project success: A meta-analysis perspective*. Computational Intelligence and Neuroscience. <https://doi.org/10.1155/2021/7517791>. ID 7517791.
- Zhou, Z., Irizarry, J., & Li, Q. (2013). Applying advanced technology to improve safety management in the construction industry: A literature review. *Construction Management & Economics*, 31(6), 606–622.
- Ziek, P., & Anderson, J. D. (2015). Communication, dialogue and project management. *International Journal of Managing Projects in Business*, 8(4), 788–803.
- Zulch, B. (2014). Leadership communication in project management. *Procedia, Social & Behaviour Science*, 119, 172.
- Zuo, J., Zhao, X., Nguyen, Q. B. M., & Gao, S. (2017). Soft skills of construction projects management professionals and project success factors. *Engineering Construction and Architectural Management*, 25(3), 425–442.

David Thorpe, PhD, Presently engaged in teaching and researching at University of Southern Queensland, Australia

Amirhossein Heravi, PhD, Presently engaged in teaching and researching at University of Southern Queensland, Australia