

Construction Project Delivery: An Investigative Analysis of Public Sector Project Stakeholders in South Africa

Zakheeya Armoed^{1*}

¹ Senior Lecturer, Faculty of Engineering, and the Built Environment,
Department of Building Science, Tshwane University of Technology, Pretoria, 0081, SOUTH AFRICA

*Corresponding Author: ArmoedZ@tut.ac.za
DOI: <https://doi.org/10.30880/ijscet.2025.16.03.001>

Article Info

Received: 14 March 2025
Accepted: 20 November 2025
Available online: 5 December 2025

Keywords

Construction, stakeholders, project delivery, public sector, influence, strategies, South Africa

Abstract

In 2023, the South African construction sector contributed to an estimated 109.5 billion ZAR to the country's gross domestic product (GDP). This was an increase from the previous year, when the sector's contribution totaled an estimated 108.9 billion ZAR; with the sector expected to grow by 4.8% in 2024, reaching 160.65 billion ZAR. This is indicative of the importance of the South African construction sector as the key contributing investor. However in recent years, the sector has been perceived to be unsuccessful in producing projects that are within the conventional measures of project time, cost and quality; with customer satisfaction, health and safety parameters, quality control and overall project sustainability failing to meet the necessary standards. As a result, an empirical gap exists in South African literature on key public sector stakeholder influence on the successful delivery of public sector construction projects, which is imperative for the continued success of the construction sector. A constructivist philosophy accompanied by a mixed methodological research approach was adopted for the study. A systematic literature review, followed by a survey questionnaire was administered to industry professionals. SPSS and AMOS v27 software analysis tools were conducted to provide a comprehensive statistical analysis and ensure validity of the research study. The salient findings for the study indicate that project stakeholder influence reflected a CR of 0.881, an AVE of 0.654 and Cronbach's Alpha of 0.896 which illustrated that the findings are valid and reliable. This demonstrates that the critical thought processes, expertise, experience, decision making and problem-solving skills of key project stakeholders play an essential role in the successful delivery of construction projects in the South African public sector, failure of which contributes to poor project performance and delivery. The research study provides valuable insight into the significance and immediate need for skilled professionals to be employed within the public sector ambit, across all stages of the project lifecycle; with consultants, contractors, clients, and public sector officials ranking from most to least influential. Strategies for implementation included, the National Skills Development Strategy and The CIDB: The Standard for Developing Skills through Infrastructure Contracts in the construction sector to promote skilled professionals.

1. Introduction

The South African construction sector has enjoyed sustained economic growth over the last two decades, due to the significant transformation policies implemented in a post-apartheid era; with an annual anticipated GDP contribution of 4.8% in 2024 [1]. The South African government is a key player in the construction sector, accounting for approximately 40% of the country's total infrastructure budget; with an estimated ZAR117.5 billion budgeted for infrastructure development in the 2022/2023 financial year, which intends to amount to ZAR903 billion over the next three years [2]. The construction sector is one that is multifaceted, and includes a diverse array of stakeholders, who have far-reaching associations and direct influence on the performance and success of infrastructure projects. These successes are responsible for generating employment and in improving the socio-economic status of society, which contributes to the nation's economy. However, despite significant contributions to the economy through public sector infrastructure development, the construction sector's performance, development, and reputation are viewed poor light [3][4][5].

Stakeholder skills capacity and performance in the South African public sector has been identified as a challenge that negatively influences growth and performance of the construction sector; with stakeholder capacity being a key constraint in achieving sustainable growth within the sector [5][6][7]. Skills capacity shortages have been identified as a significant risk in conducting business within an emerging economy like South Africa with the risk most likely to intensify nationally and globally, due to the rapid growth of the construction sector [8]. Further challenges include budget constraints, bureaucratic inefficiencies, and skills capacity shortages; with a limited number of experienced stakeholders, to deliver public sector infrastructure. The lack of built environment professionals within public sector organizations lead to delays and disruptions of construction projects. Literature findings indicate that efforts to improve public sector capacity that influences construction project performance and delivery; a direct investment in skills development and technology of public sector stakeholders that influence project outcomes and deliverables. Recommendations include policy reforms of industry standards and public private partnerships that promote diversity of skills development on a national and global scale [3].

This study fulfills; a) an empirical gap existent in South African literature with respect to stakeholder influence in the South African public sector construction, b) to establish a modality that highlights the key stakeholders responsible for the influence on project performance and delivery; and c) proposes a strategy for skills development in order to promote successful construction project delivery in the South African public sector; for recommended use and implementation by government and municipal stakeholders. Due to the acceleration of the Fourth Industrial Revolution, strategies need to be intensified to ensure that the performance and delivery of public sector construction projects are sustained. The empirical research gap strengthens the justification and findings of the study.

2. Literature Review

2.1 The South African Public Construction Sector

South Africa had previously been described as a nation with a tempestuous and violent past, however, two decades into a post-apartheid democratic society; it is now considered as an exciting and progressive society with a highly informed constitution in keeping with the rest and the best of the world; as the third largest economy in Africa [2]. The South African public sector construction sector has shown to be dynamic and multifaceted; with the implementation of transformative policies, legislations and frameworks; the sector has emerged as political transformed and emerged as the public sectors single biggest client in a post-apartheid era. The end of a period which was plagued by sanctions and racial policies which restrained its growth. The public sector has made a resolute commitment to infrastructure development and transformation amongst the historically disadvantaged communities, where significant achievements have been made in terms of capital investment with a decrease in service backlogs [5][9][10]. However, recent years have seen an emergence of challenges such as infrastructure delays and disruptions. These are a common sight in present day construction, with the mismanagement of construction projects due to its intrinsic complexity, skills capacity and economic uncertainty that it operates within [3][11][12][13].

The South African public sector construction sector has evolved to become internationally competitive through its ability to adapt and innovate itself, however it is deemed to be high risk in comparison to other industries due to its intricacy in managing an array of contrasting and interconnected set of activities and skillsets. This level of intricacy is enhanced in the execution of construction projects, where several project objectives are anticipated by a range of industry stakeholders with diverse competencies [14]. The key challenge of skills capacity and their influence on project outcomes; with a limited number of experienced stakeholders within the public sector This subsequently influences the growth, development and performance of the construction sector. Research dictates that the abovementioned inefficiency has led to a tedious and an inefficient process of financing public sector capital projects, which results in poor performance and project delivery. The fundamental role of the public sector is to continuously meet societal needs within an evolving environment, however despite South

Africa's new economic policies and framework, productivity growth and delivery remain low [3][8][15][16][17][18][19].

2.2 Project Stakeholders

Globally, the integration, partnerships and influence of stakeholders in the public sector construction sector has been identified as critical factors that influence the performance of construction projects. Stakeholders within the public sector construction sector include the client, public sector council, project managers, contractors, sub-contractors, external consultants, and any persons associated with the resulting objectives during or on completion of the projects [6][19]. Stakeholders in the construction sector are divided into internal stakeholders, who are often referred to as primary stakeholders and external stakeholders, often referred to as secondary stakeholders. Internal stakeholders are identified as individuals who are directly involved in the decision-making process within the public sector environment [20]. These include clients, project managers, architects, quantity surveyors, engineers, land surveyors, main contractors, subcontractors, and material suppliers [21]. The interrelationships between the internal stakeholders are responsible for the overarching influence that determines the resultant performance and outcome of the construction project. They are responsible for key decisions and management of the project resources; with varied degrees of influence on the project development at different stages of the project lifecycle [22]. The decisions made by internal project stakeholders, have lifelong effects on the building's performance. External stakeholders include regulatory bodies, environmental organisations and local communities who are affected by the decisions made by internal stakeholders. External stakeholders are not directly associated to the client as they do not possess contractual ties to the construction project; yet possess the authority to significantly influence the construction project. The duties and obligations of internal public sector stakeholder are well defined; however, no single stakeholder can be absolved of all project responsibilities. All internal project stakeholders involved in the public sector construction sector are contributors to the success of project performance and delivery [23][24].

Nationally, the public sector industry experiences an annual demand for project stakeholders yet suffers from an inadequate supply of construction sector professionals. The South African construction sector has grown significantly throughout the past two decades and has resulted in a shortage of skilled workers within the sector at all levels [25]. The fundamental causes of the shortage of skilled professionals in the South African construction sector includes; the migration of skilled workforce, inadequate practical exposure, the closure of training schools, and a reduced number of newly skilled employees entering into the construction sector. Additional factors include socio-economic circumstances, the lack of entry-level staff whom are skilled at co-ordination, management and the overall lack of basic education and certification [8][24][26][27]. The effective co-ordination and management of cost planning, documentation, budgets, schedules, communication, progress monitoring and administration of construction projects are often illustrated as complex processes in the construction sector, with stakeholders requiring extensive knowledge and skills in these areas. Research further indicates that communication, conversation, consultation and partnerships are considered as pillars for effective stakeholder engagement, with their influence impacting project outcomes [28]. However, the ultimate success of a project should not only be measured on traditional criterion but needs to include the interests of both direct and indirect stakeholders. Therefore, the collective skills of stakeholders enhance the professional success of infrastructure projects, and enables governmental organizations to perform as intended, for the benefit of society at large. Skills capacity development is vital to address the opportunities and challenges, to meet new industry demands of the changing local, national and global economies, in the context of globalization [29]. The urgency of public sector stakeholder skills development is an integral component of the project; as their direct and indirect influence increases project performance, project delivery, economic growth and in improving the nation's international competitiveness [8][24][30].

3. Research Methodology

The study adopted a constructivist philosophy with a quantitative research methodology. A survey questionnaire, informed by an exploratory pilot survey; gathered semi structured responses from selected experienced industry professionals on the factors influencing project delays and disruptions of construction sector projects in the South African public sector. Findings from the pilot study was adopted to ascertain the views and opinions of industry stakeholders and professionals; of their influence on success construction performance and delivery; that are actively involved in the Kwazulu-Natal construction sector. 853 registered organizations registered at Grade 6 and above, were identified on the Construction sector Development Board database for the Kwazulu-Natal region. These organizations were invited to participate in the study due to their large-scale involvement in public-sector infrastructure projects. 103 organizations were identified as suspended and/or blacklisted on the database.

Therefore only 750 organizations were contactable and eligible to participate in the questionnaire survey. The questionnaire surveys were distributed via email as well as by invitation through their registered associations requesting a senior selected professional from the organization to respond to the questionnaire survey, hosted on Google forms. A total of 103 respondents participated in the questionnaire survey due to the availability of respondents due to the coronavirus pandemic, with eight respondents presenting data that were missing or had presented irregularities [31]. The IBM SPSS Modeller Software v27 was used to statistically analyze the data received by the respondents. The survey questionnaire comprised of two sections. Section one focused on the profiles of respondents which assists in the comparison of the research respondents' ratings across all biographical profiles; with section two of the survey questionnaire focusing on the factors that influence successful construction project delivery in the South African public sector, which informed a larger study.

4. Research Findings

A primary and secondary analysis for consistency was conducted which included descriptive data analysis and exploratory factor analysis. The coded data was analyzed to identify the overall views of respondents, with the research findings being discussed in the context of previous literature. The development of structural equation models; validity and reliability analysis; regression models; path analysis and model modification were conducted, with the model design, model components, model variables, model inter-relationships and a final model development for successful construction project delivery illustrated. A total of 92.7% of the respondents were male, with 7.3% having been female. 33.4% and 30.2% of the age composition of respondents were between 50 – 59 years of age and 40 – 49 years of age respectively. A total of 85.4% of respondents were main contractors, with 7.3% of respondents being project managers and consulting engineers. 51.0% of respondents were chief executive officers of their respective organizations. The professional experience composition of respondents indicated that 42.8% of respondents had between 10-19 years of professional experience.

Table 1 below highlights the mean ratings, standard deviation, normality testing, Kolmogorov-Smirnov and Shapiro-Wilk methods that were conducted on the dataset collected from respondents to rank and measure the levels of normality. Various authors assert that the Shapiro-Wilk test for normality is the most influential method when compared to existing methods used to measure normality of the sample [32][33]. The data below indicate that the data is significantly different from the normal distribution at 0.000. As a result, maximum likelihood estimation with robust standard errors and chi-square was employed to account for the non-normality of the dataset.

Table 1 Mean rating, standard deviation and normality testing

	N	Mean	Std. Dev	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
				Stat	df	Sig.	Stat	df	Sig.
Project Stakeholder Influence									
Consultant Influence	96	8.322	2.129	.295	96	.000	.764	96	.000
Contractor Influence	96	8.270	2.751	.315	96	.000	.644	96	.000
Client Influence	96	7.531	2.850	.223	96	.000	.794	96	.000
Public Sector Officials Influence	96	6.000	3.012	.184	96	.000	.906	96	.000

Table 2 highlights the unidimensional and reliability of project stakeholder influence, and the four factor elements, using Exploratory Factor Analysis (EFA). The results illustrate that the corrected item-total correlation values were greater than the recommended cut-off value of 0.3. This indicates that the factor elements were adequate and relatively good measures of the construct. Table 4 further illustrates the factor loadings for all four factor elements, where all four elements expressed factor loading above 0.40. The communalities of the four factors also reflected values less than 0.999, demonstrating that four factor elements were within an acceptable range. These factors could be identified as key stakeholders determining the influence of project stakeholder on successful construction project delivery in the South African public sector.

Table 2 Exploratory factor analysis statistics for project stakeholder influence

Items	Factor Element	Factor Loading	Corrected item-total Correlation	Communalities	
				Initial	Extraction
B1.1	Client Influence	.929	.854	.730	.863
B1.2	Consultant Influence	.785	.744	.564	.616
B1.3	Contractor Influence	.814	.766	.605	.663
B1.4	Public Sector Officials Influence	.806	.752	.592	.649

Extraction method: Maximum likelihood

The statistical measure of reliability was determined by the Cronbach's alpha test, with findings being greater than the recommended 0.7. The four factor elements represent a Cronbach's alpha coefficient of 0.896 showing an acceptable internal reliability. The Kaiser-Meyer-Olkin (KMO) test was employed to determine the strength of the item intercorrelations for project stakeholder influence which reflected a value of 0.831, greater than the cut off value of 0.60 as shown in Table 3. Bartlett's test of Sphericity of $p < 0.000$ was obtained, indicating that the data meets the criterion for factor analyzability.

Table 3 Reliability statistics of project stakeholder influence

Items	Cronbach's Alpha	KMO	Bartlett's Test of Sphericity		
			Appr. Chi-Square	df	Sig.
4	.896	.831	236.487	6	.000

The results represented in the table 4 indicates an Eigenvalue of 3.084 that was greater than 1. This factor element denotes, a variance of 77.08% in the data which is above the recommended cut off value of 50%. As a result, adequate evidence of convergent validity and discriminant validity was provided for the project stakeholder influence construct.

Table 4 Total variance for project stakeholder influence

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.084	77.088	77.088	2.790	69.762	69.762
2	.387	9.687	86.774			
3	.331	8.279	95.054			
4	.198	4.946	100.000			

Extraction method: Maximum likelihood

Table 5 highlights the overall reliability and the corrected item-total correlation statistics of the stakeholders that influence successful construction project delivery in the South African public sector. The findings reflect unidimensional and reliability of the elements that was extracted using Exploratory Factor Analysis (EFA). The results illustrate that the corrected item-total correlation values were greater than the recommended cut-off value of 0.3, which indicates that the factor elements were adequate and good measures of the construct, recommended for SEM.

Table 5 EFA: Final corrected item-total statistics for the 6 constructs

Construct	Factor Elements	Corrected Item-Total Correlation	Cronbach's Alpha if item deleted
Project Stakeholder Influence	Client Influence	.854	0.896
	Consultant Influence	.744	
	Contractor Influence	.766	
	Public Sector Officials Influence	.752	

The confirmatory factor analysis for Project Stakeholder Influence latent variable is presented in figure 1 below, including the standardized factor loadings. The standard factor loadings of the latent variables range from

0.78 to 0.93 were all statistically significant and the result indicated convergent validity. The model did not include any cross loadings; therefore, the standardized factor loadings were interpreted as the correlation between the observed variable and the construct it loaded onto.

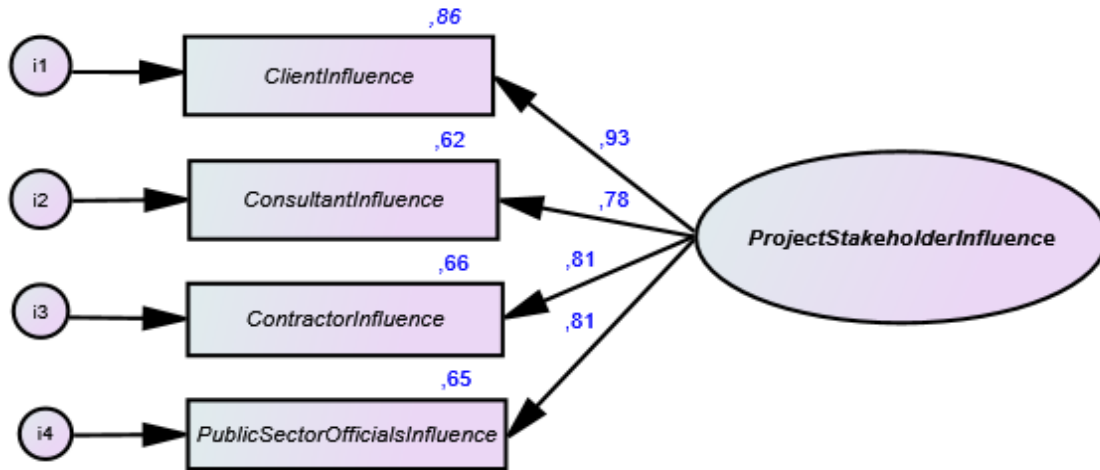


Fig. 1 Measurement model for construct one: Project stakeholder influence; legend: i1, i2, i3, i4 – error terms

The Goodness-of-Fit test was conducted with findings indicated in table 6. The Absolute Fit Indices; CMIN/df = 0.574 and the RMSEA value = 0.077 indicate that the theoretical model of project stakeholder influence fits the empirical data acceptably good. The Incremental Fit Indices; CFI (1.000), IFI (1.004), NFI (0.995) and TLI (1.011) were indicative of a good fit and as a result suggest an acceptable model fit. The overall validity of the observed variables for *Project Stakeholder Influence* was robust and statistically significant.

Table 6 Goodness-of-fit for construct one: Project stakeholder influence sub-model

Construct One: Project Stakeholder Influence			
Model Fit Index	Threshold	First SEM	Acceptability
Absolute Fit Indices			
CMIN/df	< 2	0.574	Good fit
Root Mean Square Error of Approximation	Value < 0.05 Value is 0.06 - 0.08	0.077	Acceptable fit
Incremental Fit Indices			
Bentler Comparative Fit Index (CFI)	Value ≥ 0.95 Value is 0.90 - 0.95	1.000	Good fit
Incremental Fit Index (IFI)	Value ≥ 0.95 Value is 0.90 - 0.95	1.004	Good fit
Normed Fit Index (NFI)	Value ≥ 0.95 Value is 0.90 - 0.95	0.995	Good fit
Tucker - Lewis Index (TLI)	Value ≥ 0.95 Value is 0.90 - 0.95	1.011	Good fit

Table 7 illustrates that the factor loading of each variable was above the threshold limit of 0.50. The composite reliability index indicated 0.881 which signifies that the model has attained composite reliability, adequacy and appropriateness. The average variance extracted value of the model measures the level of variance of a construct in respect to the measurement error of the structural model. The constructs illustrate that the model has achieved the average variance extracted value which ranged between 0.654 and an internal reliability of 0.896 which is significantly above the recommended 0.7.

Table 7 Reliability and validity of the structural model

	Observed Variable	Factor Loading	CR	AVE	Cronbach's Alpha
Project Stakeholder Influence	PSI1	0.929	0.881	0.654	0.896
	PSI2	0.785			
	PSI3	0.814			
	PSI4	0.806			

Table 8 highlights the standardized regression weights of the four factors associated with project stakeholder influence construct of the SEM that were all above the threshold limit of 0.1 with the highest value being *client influence* (0.929). The hypothesized relationships of the project stakeholder influence construct present a CR value of 0.881 that positively support the hypothesized relationships. The research analysis results positively indicate that the participants of the research study consider the four factors as essential project stakeholders that that influence project performance and delivery in the public sector construction sector.

H1: A positive relationship is predicted between Project Stakeholder Influence and Client Influence

H2: A positive relationship is predicted between Project Stakeholder Influence and Consultant Influence

H3: A positive relationship is predicted between Project Stakeholder Influence and Contractor Influence

H4: A positive relationship is predicted between Project Stakeholder Influence and Public Sector Officials Influence

Table 8 Structural model hypothesis testing

Latent Constructs	Estimate	S.E.	C.R	p-Value	Conclusion
Project Stakeholder Influence	0.745	0.063	10.326	***	Cannot be rejected

5. Discussion of Findings

The study focused on a primary and empirical research objective. The primary research objective was to identify the key stakeholders that influence public sector project performance and delivery in the South African construction sector. IBM SPSS version 27 and AMOS version 27 add-on for SEM was used to test the relationships between the various constructs and components of the model. Through critical principal component analysis (PCA) and structural equation modelling (SEM), techniques were used to develop to identify the key stakeholders in order of importance. These advanced methodologies were employed to test the statistical adequacy of the proposed research model in an effort to confirm or reject the hypothesized relationships. Cognitive mapping and critical path models were used to accurately explicate the observed factors, highlighting the statistical significance of the path coefficients. The reliability and validity of the study were considered to be statistically adequate. Furthermore, the goodness-of-fit indices of the structural research model were deemed to be satisfactory. The critical path model analysis illustrated that all the hypothesized relationships were found to be significant. The reliability of the model was evaluated with Cronbach's alpha, Average variance, Item-total correlations and Composite Reliability testing, highlighted in Table 9, with all items meeting the minimum threshold of 0.30 for item-total correlation.

Table 9 Findings on the reliability and validity of the final structural model

Constructs	CR	AVE	Cronbach's Alpha
Project Stakeholder Influence	0.881	0.654	0.896

It is evident that the findings reported in Table 10 highlight the four key project stakeholders that influence project performance and delivery in the construct.

Table 10 Project stakeholder influence

Project Stakeholder Influence	Mean	Std. Deviation	Ranking
Consultant Influence	8.322	2.129	1
Contractor Influence	8.270	2.751	2
Client Influence	7.531	2.850	3
Public Sector Officials Influence	6.000	3.012	4

A positive relationship was predicted between project stakeholder influence and consultant influence, contractor influence, client influence and public sector officials influence. It is clear from the table above that *consultant influence* with a mean of 8.322 ranked highest out of the four factors presented to the respondents. *Contractor influence* ranked second highest with a mean of 8.270, *client influence* ranked third and *public sector officials influence* ranked fourth with means of 7.531 and 6.000 respectively within the *Construct One: Project Stakeholder Influence*. The research further highlights that the influence of *consultants* in the construction sector is a key factor that significantly impacts the successful delivery of construction projects in the South African public sector.

6. Conclusion

Public sector construction projects in South Africa are plagued with a negative reputation, due to issues pertaining to unethical procurement practices, project delays, unsuccessful project delivery and corruption associated with public sector project stakeholders. As a result, public sector construction project stakeholders are required to function effectively daily, to ensure a positive constructive impact on the overall quality and performance of public sector construction projects. Stakeholders are required to be adequately skilled; as well as professionally and socially responsible [24][30][33]. Authors highlight that in order to attain successful project performance, public sector stakeholders are required to be encouraged and nurtured with an aptitude in decision-making, health and safety competence, problem-solving, leadership, teamwork, sustainability and green construction. Together, project stakeholders promote the success of a project through the provision of expertise, by reducing and uncovering risks and in ensuring a positive project outcome. Research findings further reinforce these sentiments; with the influence of consultants ranking the most important with a mean of 8.322 out of the four key stakeholders; and public sector officials ranking the least important of the stakeholders responsible for successful public sector construction project delivery. Authors further highlight the significance for key project stakeholders to be aware of project delivery expectations, associated risks and the manner in which these risks are mitigated. The study recommends two immediate strategies for implementation by public sector governmental agencies. These include a) *National Skills Development Strategy (NSDS III)* - The NSDS III offers employers the opportunity to capacity build and support their employees to improve productivity and address skills disparities. The strategy further supports training through scholarships from the Sector Education and Training Authorities (SETAs) [33] and b) *Construction sector Development Board: The Standard for Developing Skills through Infrastructure Contracts* - The Construction sector Development Board has developed a standard that requires main and sub-contractors to attain a skills development objective for each respective contract that they pursue. The objective can be achieved through a range of methods, which includes a structured workplace apprenticeship, and work integrated learning opportunities [18]. The successful capacity development of public sector construction project stakeholders in the current climate of the public sector and the effective management of key project stakeholders are essential to overall project performance and successful project delivery [3][8][24][30].

Acknowledgement

Communication of this research is made possible through monetary assistance by The Tshwane University of Technology, Pretoria West, Gauteng, 0081, South Africa.

Conflict of Interest

Author declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

References

- [1] Research and Markets. (2024, October 2). South Africa Construction sector Databook Series - Market Size & Forecast by Value and Volume (area and units), Q2 2024 Update. Research and Markets. <https://www.globenewswire.com/news-release/2024/10/02/2957110/28124/en/South-Africa-Construction-Industry-Report-2024-Output-Expected-to-Reach-ZAR-190-66-Billion-by-2028-Driven-by-PPIs-Infrastructure-Development-and-Technological-Advancements.html>
- [2] Cowling, N. (2024, March 20). Construction sector's value added to GDP in South Africa 2016-2023. Statista. <https://www.statista.com/statistics/1121217/construction-sector-value-added-to-gdp-in-south-africa/>
- [3] Mongane, N. (2024, March 26). The present challenges affecting the growth of the construction sector. Construction World. <https://www.crown.co.za/construction-world/marketplace/27912-the-present-challenges-affecting-the-growth-of-the-construction-industry#:~:text=In%20the%20South%20African%20public,to%20deliver%20public%20sector%20infrastructure.>
- [4] Construction Industry Development Board. (2012). The Construction sector as a Vehicle for Contractor Development and Transformation. Pretoria, South Africa: CIDB.
- [5] Cottle, E. (2014). Twenty years of transformation of the construction Sector in South Africa since the end of Apartheid, Bargaining Indicator: Labour Research Service. Durban: UKZN Press.
- [6] Xegwana, M.S., Herron, A.G. and Nyika, F., (2024). Assessing Factors Influencing Stakeholder Engagement on Construction Projects. *European Project Management Journal*, 14(1), pp.3-10.
- [7] Masiya, T., Davids, Y.D. and Mangai, M.S., 2021. Factors affecting the performance of South African municipal officials: Stakeholders' perspectives. *Commonwealth Journal of Local Governance*, (25), pp.97-115.
- [8] Musonda, I. and Okoro, C., 2021. Assessment of current and future critical skills in the South African construction industry. *Higher Education, Skills and Work-Based Learning*, 11(5), pp.1055-1067.
- [9] Palmer, I., Graham, N., Swilling, M., Robinson, B., Eales, K., Fisher-Jeffes, L., Käsner, S.A. and Skeen, J. (2016). South Africa's Urban Infrastructure Challenge. Contribution to the Integrated Urban Development Framework.
- [10] Herbertson, A and Kungwane, R. (2024). Municipal infrastructure: A complex landscape with emerging opportunities. *Ninety-One*. <https://ninetyone.com/en/south-africa/insights/infrastructure-investing/municipal-infrastructure-a-complex-landscape-with-emerging-opportunities>
- [11] Alsharef, A., Ovid, A., Jamil Uddin, S.M. and Albert, A., 2024. Biggest challenges facing the construction industry. In *Construction Research Congress 2024* (pp. 652-660).
- [12] International Labour Organisation. (2001). Sectoral Activities Programme (ILO). The construction sector in the twenty-first century: its image, employment prospects and skill requirements: report for discussion at the Tripartite Meeting on the Construction sector in the Twenty-first Century: Its Image, Employment Prospects and Skill Requirements, Geneva, 2001. International Labour Office, Geneva, Switzerland, 2001.
- [13] Haupt, Theo. (2016). The image of the construction sector and its employment attractiveness. *Acta Structilia*. 23. 79-108. 10.18820/24150487/as23i2.4.
- [14] Shen, L.Y., Platten, A. and Deng, X.P., (2006). Role of public private partnerships to manage risks in public sector projects in Hong Kong. *International journal of Project management*, 24(7), pp.587-594.
- [15] Department of Higher Education and Training. (2023). Identification of Skills Gaps in South Africa – A Technical Report. Published in 2024 by the Department of Higher Education and Training. Private Bag X174, Pretoria 0001. www.dhet.gov.za. ISBN: 978-1-77018-969-0
- [16] Mkhonza, L and Letsoalo, A. (2017). Understanding the Skills Gaps in the Public Service Sector – Research Report. Public Service Sector Education and Training Authority (PSETA). Pretoria.
- [17] Hausmann, R., O'Brien, T., Fortunato, A., Lochmann, A., Shah, K., Venturi, L., Enciso-Valdivia, S., Vashkinskaya, E., Ahuja, K., Klinger, B. and Sturzenegger, F. (2023). Growth Through Inclusion in South Africa (Vol. 434). Center for International Development at Harvard University.
- [18] Construction sector Development Board. (2023). Standard for Developing Skills through Infrastructure Contracts. Department of Public Works and Infrastructure. Notice 1769 OF 2023.
- [19] Wideman, R. M. (2022). Project and program risk management a guide to managing project risks and opportunities. Project Management Institute, Inc.

- [20] Rajeev, S.; Kothai, P.S. (2014). Study on the influence of stakeholders in construction projects. *Journal of Construction Engineering and Project Management*, 4, 8–11
- [21] Isa, R.B.; Jimoh, R.A.; Achuenu, E. (2013). An overview of the contribution of construction sector to sustainable development in Nigeria. *Net Journal of Business Management*, 1, 1–16.
- [22] Aapaoja, A.; Haapasalo, H. (2014). A framework for stakeholder identification and classification in construction projects. *Open Journal of Business and Management*, 2, 43–55.
<http://doi.org/10.4236/ojbm.2014.21007>
- [23] Saka, Q.O., Olanipekun, A.A., Uwumarogie, D. and Idusuyi, O.O.A., 2024. Causes, Socioeconomic Effects and Potential Solutions of Incessant Building Collapse in Nigeria: A Review.
- [24] AL-Fadhali, N., (2024). An AMOS-SEM approach to evaluating stakeholders' influence on construction project delivery performance. *Engineering, Construction and Architectural Management*, 31(2), pp.638-661
- [25] Mopeli, S.A. (2014), "Training and skills development of senior municipal officials in the Johannesburg Metropolitan", University of Johannesburg.
- [26] Windapo, A.O., and Cattell, K. (2013). The South African Construction sector: Perceptions of Key Challenges Facing Its Performance, Development and Growth. *Journal of Construction in Developing Countries*, 18(2), 65–79, 2013.
- [27] Tshela, L. and Agumba, J.N. (2014), Investigating the causes of skills shortage in South African Construction sector: A Case of Artisa, TG 59 Conference, 6-8 April 2014, Port Elizabeth.
- [28] Stocker, F., de Arruda, M. P., de Mascena, K.M., & Boaventura, J. M. (2020). Stakeholder engagement in sustainability reporting: a classification model. *Corporate Social Responsibility and Environmental Management*, 27(5), pp.2071-2080.
- [29] Luo, F., Li, R. Y. M., Crabbe, M. J. C., & Pu, R. (2022). Economic development and construction safety research: A bibliometrics approach. *Safety Science*, 145 (2022), pp. 1-10.
- [30] Ndekile, C. and Ugwuanyi, W., (2023). Effect Of Strategic Stakeholder Engagement on Successful Project Delivery. *FUO Journal of Management Sciences*, 7(Special), pp.55-67.
- [31] Tabachnick, B. G., and Fidell, L. S. (2019). *Using Multivariate Statistics* (7th ed.). Boston, MA: Pearson.
- [32] Razali, N.M. and Wah, Y.B. (2011). Power comparisons of Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors and Anderson-Darling tests. *Journal of Statistical Modeling and Analytics*, 2(1), pp.21-33.
- [33] Keskin, H. (2006). Market orientation, learning orientation, and innovation capabilities in SMEs. *European Journal of Innovation Management*.
- [34] Department of Higher Education and Training. (2019, March 7). National Skills Development Plan, 2030. Pretoria, South Africa. Department of Higher Education and Training. Gazette Number: 42290.
https://www.gov.za/sites/default/files/gcis_document/201409/national-skills-development-strategyiiiia.pdf
- [35] Mazibuko Chalwa, P.N., (2025). Construction Industry's Dysfunctionality-A Case of Stakeholder Behaviour in South Africa. *CIB Conferences* (Vol. 1, No. 1, p. 84).