Received: 22 November 2024 | Revised: 23 April 2025 | Accepted: 10 July 2025 | Published online: 26 August 2025

RESEARCH ARTICLE

Journal of Comprehensive Business Administration Research
2025, Vol. 00(00) 1–14
DOI: 10.47852/bonviewJCBAR52024878

BON VIEW PUBLISHING

Modeling the Impact of Transformational Leadership Style on Construction Project Performance

Femi-Favour Olabode Olasunkanmi[1,*], Dubem Isaac Ikediashi[2], Jacob Atser[3] and Emmanuel Chongcicimmi Ibrahim[4]

[1]*Department of Building, Niger Delta University, Nigeria*

[2]*School of Engineering and the Built Environment, Edinburgh Napier University, UK*

[3]*Department of Urban and Regional Planning, University of Uyo, Nigeria*

[4]*Department of Building Technology, Covenant University, Nigeria*

Abstract: Leadership style in project delivery is enjoying wider consideration as part of the evolution in the modern world beyond the deployment of technical expertise. Therefore, this work investigates how the adoption of transformational leadership style (TFLS) by project managers (PMs) influences the outcome of projects in Nigeria. The conceptual path model uses a structural equation modeling (SEM) approach to determine the strength of association between the factors of TFLS and project outcome indicators. Data collected through a questionnaire survey of 975 respondents were tested, deemed reliable and consistent by a .901 Cronbach alpha value. While descriptive data analysis was achieved through SPSS Statistics software. Results show that the intellectual stimulation and charismatic influence of TFLS significantly influence the outcome of construction projects. Also, 20.9% of the variability in the performance indicators is accounted for by the variables of TFLS, which, by implication, improve performance by 20.9%. The construction stakeholders could incorporate these findings with advantageous factors of other styles to eliminate age-long performance issues associated with project delivery in the study area and across the globe. The study contributes to the literature on the application of the structural equation model in analyzing relationships among latent constructs of measurement within the industry. Using SEM has added to the nexus of leadership research in the Nigerian construction industry, just as has been witnessed by other aspects of construction management. The study emphasized and concluded on the important aspect of TFLS to be incorporated by PMs in Nigeria to ensure enhanced productivity and achievement of organizational goals.

Keywords: transformational leadership, construction, project delivery, structural equation modeling, Nigeria.

1. Introduction

Construction projects in the modern world have evolved beyond just the deployment of the technical expertise of building and engineering professionals to the management of human and material resources for their realization. Construction activities require personnel from various walks of life working together to achieve a common goal, hence the emergence of leadership functions. Leadership is gaining prominence from construction project stakeholders to underline its importance in enhancing project delivery [1]. The essence of leadership stems from the ability to clearly formulate an action plan and encourage subordinates to concentrate attention on accomplishing the set objectives. This thought about leadership is aptly applicable to construction project delivery. Also, it is the capacity to ensure that ordinary people accomplish extraordinary feats. Therefore, with leadership occupying an essential place in human daily existence, it becomes a major aspect of the functions of professionals, academia, and construction managers. Leadership is the pursuit of extraordinary feats beyond just being average. The obligation of a leader is to identify the right direction and lead by example [2]. The approach adopted by the leader to enforcing compliance with designed directives toward achieving desired objectives is known as leadership styles [3, 4]. Consequently, a construction manager as a team leader has an onerous task of extracting the best from seemingly ordinary subordinates or followers by knowing, showing, going, and leading the right way. Leadership, among others, is a crucial success factor in project and construction management and, therefore, should occupy a vantage position in its discourse [5]. The construction industry in Nigeria has a more urgent requirement for leadership than any other because of its unregulated nature. The reasons for this dire need may be attributed to project uniqueness and outcome. Others are large and complex nature of construction projects with the requirement of a team of experts with technical and specialized skills from multidisciplinary backgrounds. Considering this peculiarity, a relationship-oriented project manager (PM) with special skills in man management is most desirable. The best-fit option in this way is transformational leadership. The PM should adopt and exhibit a transformational leadership approach, according to Oyetunji et al. [6] in relating

[*]**Corresponding author:** Femi- Olabode Olasunkanmi, Department of Building, Niger Delta University, Nigeria. Email: femi-favourolasunkanmi@ndu.edu.ng

with subordinates so as to enjoy the best of their performance and satisfaction. Although construction managers are tasked with the responsibility of finishing the projects on time and within budget, this has become their main focus; however, achieving this is a function of their man management capacity. A transformational manager is more of a leader than a manager; while a manager attention is on completing the task, the leader focuses on how the task can be accomplished. A leader is distinguished from a manager; thus, a manager is concerned with the system, while a leader's attention is on the people. Additionally, a transformational leader provides necessary information to the subordinates that enables them to build capacity on decision-making with little or no influence upon such procedure, leading to the decision. Though the process could take extra resources, it is worthwhile, especially when the interest of the organization is uppermost in the heart of the subordinates. Through this approach, subordinates' morale is boosted, teamwork and inclusiveness are encouraged, and the loyalty of the project team is secured [7].

The successful outcome of the project had been a longtime concern of stakeholders [8, 9], leading to consideration of various measuring parameters. Therefore, the emergence of three key parameters (cost, time, and quality) is known as performance indicators. The concept of successful delivery of a construction project is captured by performance – a situation where, once the desires of all key participants in projects are satisfied, the project is said to be successful. This is also called project performance. El Khatib et al. [10] defined performance as fulfilling the aspirations and yearnings of projects' stakeholders. Project performance is also realizing the specific aim of the organization through the process of prompt delivery of construction works within the confines of a set yardstick for measurement. Beyond these initial criteria are other factors pivotal to success; a fresh leadership approach, regarded as an indispensable asset to performance, is to be given prominence in this era of challenging project conditions caused by numerous changes and complexities [11].

The fundamental basis for this research is the obvious fact that there is no leadership direction for construction professionals in Nigeria. Whether they are leaders or managers remains a subject of controversy, even among the operators within the construction industry. According to Oke [12], construction leaders exhibit transactional traits more often than others, even though they suggest the development of transformational leadership for possible adoption. The conclusion of a study by Oyetunji et al. [6] was on the display of transformational leadership traits by construction managers without specifying whether the adoption was component-based or holistic. The suggestion by Oke [12] led to the conclusion by Olasunkanmi et al. [13] that the intellectual stimulation and charismatic (idealized) influence aspect of transformational leadership style (TFLS) are frequently used by construction managers in Nigeria without stating their level of impact on performance. This has created a gap to be filled and a path being explored by this study as no one could say emphatically whether this leadership style influences construction projects significantly or not. Additionally, the fact that no particular leadership style could be said to be appropriate in the Nigerian situation corroborates the conclusion of research [14] that no single style of leadership could be appropriate for all situations. Lack of literature on the exact leadership style (either single or combined) that can or will boost performance has been the major concern of the industry. Coupled with findings in other climes, all the components of a particular style, when adopted, may not yield the desired, anticipated result. There is therefore a need to investigate which factors of TFLS will improve the performance of construction works within the Nigerian sector by employing the structural equation modeling (SEM) technique. Although structural modeling has enjoyed wide application in other disciplines, it has been rarely employed in construction or project management research in the Nigerian construction industry, most especially in the leadership aspect.

SEM is described as a multivariate technique that enables the examination of relationships among multiple dependent or independent constructs of a model simultaneously. Simultaneous estimation of interconnectivities among variables of latent constructs and even among the unobserved variables is made possible by SEM. The development and testing of theories through the use of survey data in social and behavioral research have greatly employed SEM. Construction-related and facility management researchers are not left out, prominent among them are studies by Ali et al. [15], Alaloul et al. [16], and Unegbu et al. [17]. The study by Ali et al. [15] established the supremacy of the SEM method over other multivariate techniques used in previous similar researches as it improves understanding of the concept under investigation. Consequently, based on its advantages and usefulness, the SEM approach has been adopted by other researchers in many ways to solve research problems [16–18]. The relationship shown in SEM represents the hypothetical/path model of the research. Using SEM in this study to show the strength of interconnectivity and the effects of factors of transformational behaviors of PM on the outcome of construction projects shall be among the front-runners in its applicability on leadership studies in the Nigerian industry. Factors of transformational leadership are latent variables in this context, while selected project performance indicators (PPIs) are manifest variables.

Given the above background, this research effort intends to identify the aspects of TFLS that will be advantageous or otherwise to the successful delivery of projects within the Nigerian construction sector. The primary objective is to determine how TFLS of PM impacts the performance of construction projects through the SEM approach in ascertaining the effects of latent constructs on project success indicators.

2. Literature Review

2.1. Leadership characteristics and project success

Various factors have been used to describe the behavioral pattern of PM. Factors such as competencies, personalities, characteristics, skills, and leadership styles of a construction manager affect the success as well as the delivery of construction products. Therefore, the performance of a construction project is a product of most, if not all, of these factors. The concepts of success and performance of construction projects are being swapped in the literature on construction project management. Under the theme of this study, the submission that "performance is the degree of achievement of an objective" captures the subject for consideration. Either success or performance, the product of construction activities meeting the intended purpose is the ultimate. Therefore, the beam of light is focused on all such factors that can engender the achievement of this goal. Leadership characteristics, styles, skills, competencies, and others required for the attainment of performance/success must be imbibed or encouraged and incorporated.

The opinion that leadership style and ability are crucial to business attaining success cannot be overemphasized. Sethole [19] and Hanandeh et al. [20] have revealed leadership among several success factors as the most significant to project success. Based on the assertion of Jarad [21], the study of correlation between project management style and types by researchers has not yet yielded any outcome to indicate the impact of managers' personality on

performance or success of such a project. However, some other studies have ascertained the connectivity of these leadership traits with organizational performance. Similarly, a link may be established between the significance of leadership and the success of a project or a project type. It has been mentioned in the literature that project complexity may possibly be exacting moderating effect on the correlation between leadership display and the rate of success of projects. Jarad [21] then enthused that skill in the technical and leadership field is non-negotiable for an efficient project leader even when a proper relationship is yet to be established among the skills, personality, and success of projects. Again, no conclusion is drawn yet on a project leader influencing the project outcome by exhibiting considerably different characteristics according to project type. However, some traits of PMs may be postulated to be directly associated with the success of projects and leadership abilities such as empathy, carefulness, thoroughness, and encouragement, among others. The appropriateness of different leadership styles for different project types may be considered a norm and a good suggestion. Management Adda [14] ascertained that different situations may require different leadership approaches. In conclusion, among the factors that will culminate in the successful delivery of the project is the effectiveness of the project leader.

2.2. Correlation of transformational leadership style with project success

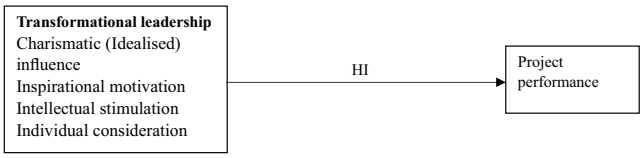
TFLS is linked with all levels of success recorded in projects and, therefore, is regarded as the leading leadership theory in this generation. Various researchers across the globe, from Europe to Asia, and then Africa, have given credence to this assertion. Gębczyńska [22] established the significant influence the PMs' transformational leadership trait has on the success of projects in Poland and its suitability to the project context in all ramifications. Liphadzia et al. [23] concluded that TFLS enjoyed a high ranking in the South African construction industry because of its strong influence on project success. Research work by Amin et al. [24] showed the adoption of TFLS by project managers to increase project success rates, while to Aga et al. [25], its importance in project success cannot be overemphasized, though the study was limited to only nongovernmental organisations in Ethiopia. Recent studies by others have also shown TFLS and project success to be positive and significantly correlated [26, 27]. Ali et al. [28] concluded that various components of TFLS play a major part in influencing and improving subordinate performance, motivating collaborative effort among team members toward achieving set goals. In the same vein, some components of TFLS were found to be used frequently by project managers in Nigeria [13]. The influence of TFLS on performance cannot be overemphasized. Therefore, further examination of how it can be used to boost performance and increase the success rate of construction projects is a necessity especially in the Nigerian construction industry.

2.3. Theories and hypotheses underpinning the study

The roles of a leader in the construction process in knowing, showing, and going the right way to achieve the project's objective by carrying the subordinate along form the basis of the transformational theory that supports this study. Transformational theory in the modern era is a blend of servant leadership, leadership–member exchange, and leader–follower theories. A construction project manager (PM) is expected to serve first before leading the subordinates, the core concept of servant leadership as introduced by Hannay [29]. The PM, as a team leader, was chosen to serve and empower the followers until the best of their potential is realized on the job. This is made possible by fostering good quality relationships with the employees by being interested in their social, physical, and emotional well-being. Leader–member exchange theory strongly emphasizes trust and respect between leader and follower as a prelude to high-quality relationships [30]. The emergence of a better leader is a product of this level of relationship. The attributes of these previously mentioned theories are embodied and summed up in transformational theory. The focus of the theory is on a relationship of encouragement, motivation, mutual respect, and elevation in which subordinates are promoted to leaders while leaders become change agents. The unfolding of this theory deepens and gives credence to the leader–follower theory. The construction team leader (PM) must be envisioned, dependable, held in high esteem, and exhibit, among others, attentiveness, kindness, empathy, foresight, trustworthiness, and motivation to ensure the achievement of the targeted goal. Additionally, he/she must walk the talk (charismatic (idealized) behaviors), show clear vision and direction (inspirational motivation), and be tenacious in problem-solving from different perspectives (intellectual stimulation) and exhibiting good character by showing concern for others (individual consideration).

Based on the foregoing understanding, the study developed a theoretical framework for the influence of TFLS on performance indicators as displayed in Figure 1. It is a hypothesized model that depicts the connectivity among the latent constructs of variables in the model. The relationship between the constructs of transformational leadership (charismatic (idealized) behaviors, inspirational motivation, intellectual stimulation, and individual consideration) and project performance indicators is examined by the model. The following hypothesis is thus formulated based on the framework:

Figure 1
Theoretical framework for TFLS and project performance



H_1: Transformational leadership style has a significant effect on the performance of construction project.

The earliest 6 identified dimensions of transformational leadership were modified into 23 measurement items as shown in Table 1. These were adopted and thus used as variables after pilot-testing. Among others, a few performance indicators chosen are peculiar to the Nigerian construction industry according to the outcome of the pilot study as shown in Table 2 and already used by Olasunkanmi and Belonwu [31].

The latent variables of TFLS in Table 1 and project performance indicators in Nigeria in Table 2 are further divided into components and coded accordingly as required by SEM analysis, as shown in Table 3.

3. Research Methodology

The methodology is a cross-sectional survey in nature, with data collected once from all sources that constitute the population. The study population was employees of construction firms from FCT (Abuja), Lagos, and Rivers. These locations were chosen because of their status as vibrant cities with huge economic

Table 1
Transformational leadership measurement indices and modified by the author

1	The manager displays power and confidence whileadministrating project activities.
2	The manager arouses awareness about important tasks and schedules in the project.
3	The project manager encourages the team to look at problems from different dimensions.
4	The manager appreciates our different abilities and therefore provides individualized attention to staff.
5	Always seeking new opportunities for the organization.
6	Paints an interesting picture of the future for team member.
7	Has a clear understanding of where the project is going.
8	Inspires others with his/her plans for the future.
9	Is able to get others committed to his/her dreams of the future.
10	Leads by "doing" rather than simply by "telling."
11	Provides a good model to follow.
12	Fosters collaboration among team members.
13	Encourages employees to be "team players."
14	Gets the team to work together for the same goal.
15	Develops a team attitude and spirit among all employees.
16	Shows the team that he/she expects a lot from them.
17	Insists on only the best performance.
18	Shows respect for employee's personal feelings.
19	Behaves in a manner that is thoughtful of employee's personal needs.
20	Treats subordinate without considering his/her personal feelings.
21	Has provided employee with new ways of looking at things which used to be a challenge.
22	Has ideas that have forced employees to think otherwise about their own initial challenge.
23	Has stimulated subordinates to think about old problems in new ways.

Table 2
Project performance indicators in Nigeria

1	Finish project within the budget
2	Finish project on time
3	Enhanced quality standard
4	Lead to improved project team satisfaction
5	Increase the level of productivity
6	Retain talents with the company
7	Enable competitive advantages to the company
8	Enhance the image of the company
9	Enhance client satisfaction
10	Enable continuous improvement
11	Given the problem for which it was developed, the project seems to do the best
12	Project specifications were met by the time of handover to the target

investment and potential in Nigeria as used by Olasunkanmi et al. [2] for a similar study. The quantum of construction projects undertaken by local and foreign firms in these locations attests to this fact. The targeted respondents within the firms are the project managers (PMs), project team members (PTMs) (who are construction professionals: architects, builders, engineers, and quantity surveyors), and firm's project supervisors (SUP). The population frame was sourced from the Federal Inland Revenue Service (FIRS) of Nigeria, which possessed higher registered construction firms to meet the level of feedback desired by the study. Evidence of tax payment to FIRS through tax identification number (TIN) in the last three years prior to the conduct of this study is proof of the operation of these firms. Accessible office location and verifiable email address determined the population used across the study area. The heterogeneous nature of the considered population, in which the respondents were divided into strata (location and cities) for adequate representation, warranted the use of a stratified random sampling method. Additionally, purposive sampling helped to pick participants within the firms as recommended by the PM. The famous Taro Yamane (1967) equation shown in Equation (1) was used to determine the sample size:

$$n = N/(1+N)(e)2 \quad (1)$$

where n = the sample size, N = the population under consideration, and e = the margin error, usually (0.05). The sample frame and size are as displayed in Figure 2.

From the equation, the sample size is 411 firms as derived from the sample frame of 637 firms. The study, therefore, has a total of 1233 participants from 411 firms, with each firm having 3 representatives. Figure 2 shows the order of allocation as follows: Lagos – 148 firms; Rivers – 105 firms; and FCT (Abuja) – 158 firms.

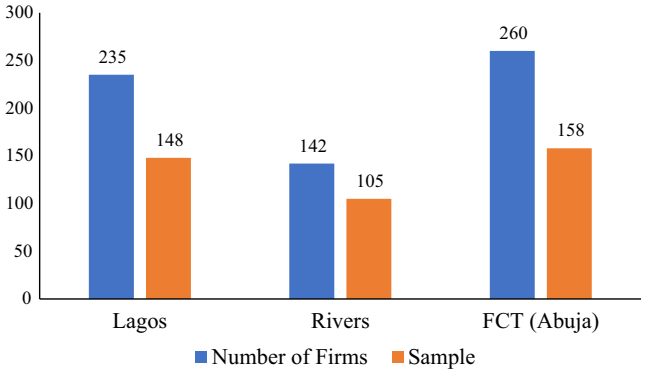
3.1. Research instrument and distribution

The use of cross-sectional questionnaire was deemed necessary for collection of data in this study because of elimination of biases, simple to analyze and mostly used by previous researchers on subject of this nature. The content of the research instrument was validated by experienced construction practitioners in private practice and in academia. Out of 1233 well-structured questionnaires

Table 3
Summary of latent and observed variables used in the study

Latent variables	Measurement indices	Observable variable (indicator)	Code Name
Transformational leadership style	Charismatic influence	The manager displays power and confidence while administrating project activities.	FTF1
		Always seeking new opportunities for the organization.	FTF5
		Has a clear understanding of where the project team is going.	FTF7
		Is able to get others committed to his/her dreams of the future.	FTF9
		Leads by "doing" rather than simply by "telling."	FTF10
		Provides a good model to follow.	FTF11
		Fosters collaboration among team members.	FTF12
	Inspirational motivation	The project manager encourages the team to look at problems from different dimensions.	FTF3
		Paints an interesting picture of the future for team member.	FTF6
		Inspires others with his/her plans for the future.	FTF8
		Encourages employees to be "team players."	FTF13
		Gets the team to work together for the same goal.	FTF14
		Develops a team attitude and spirit among all employees.	FTF15
	Intellectual stimulation	The manager arouses awareness about important tasks and schedules in the project.	FTF2
		Shows the team that he/she expects a lot from them.	FTF16
		Insists on only the best performance.	FTF17
		Has provided employee with new ways of looking at things which used to be a challenge.	FTF21
		Has ideas that have forced employees to think otherwise about their own initial challenge.	FTF22
		Has stimulated subordinates to think about old problems in new ways.	FTF23
	Individual consideration	The manager appreciates our different abilities and therefore provides individualized attention to staff.	FTF4
		Shows respect for employee's personal feelings.	FTF18
		Behaves in a manner that is thoughtful of employee's personal needs.	FTF19
		Treats subordinate without considering his/her personal feelings.	FTF20
Project performance indicators	Cost	Finish project within the budget.	PPI1
	Time	Finish project on time.	PP12
	Quality	Enhanced quality standard.	PPI3
		Enable continuous improvement.	PPI10
		Given the problem for which it was developed, the project seems to do the best.	PPI11
		Project specifications were met by the time of handover to the target.	PPI12
	Stakeholder expectation	Lead to improved project team satisfaction.	PPI4
		Increase the level of productivity.	PPI5
		Retain talents with the company.	PPI6
		Enable competitive advantages to the company.	PPI7
		Enhance the image of the company.	PPI8
		Enhance client satisfaction.	PPI9

Figure 2
Sample frame and sizes



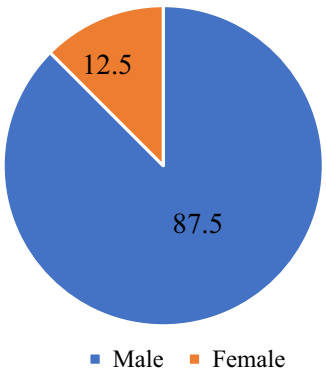
distributed, 975 were retrieved, with a required response adequate for analysis. Distribution was done directly to participants within the firm through the PMs, while others were done with the help of research assistants who contacted the PMs directly. There were only two divisions in the research instrument: one section captured the participants' profiles, while the other sought the perception of participants on the frequency of adoption of TFLS by the PMs. Scales of measurement used were nominal and ordinal; both were employed in section one for the respondents' profile, whereas only ordinal was used for part two. The ordinal scale in part two was on a five-point Likert scale: 1 – strongly disagree; 2 – disagree; 3 – moderate (slightly agree); 4 – agree; 5 – strongly agree. The participants were requested to rank the frequency of adoption of TFLS by the PM using the scale thus provided. Based on the possession of required knowledge and experience by the respondents on the subject under investigation, neutral response was excluded from the five-point scale as opinionated by Nowlis et al. [32].

3.2. Respondents' characteristics

A descriptive analysis of respondents' characteristics whose opinions were sought is displayed in figures and tables. Among others, features such as sex, academic qualification, and cognate experience were presented in percentages using SPSS software.

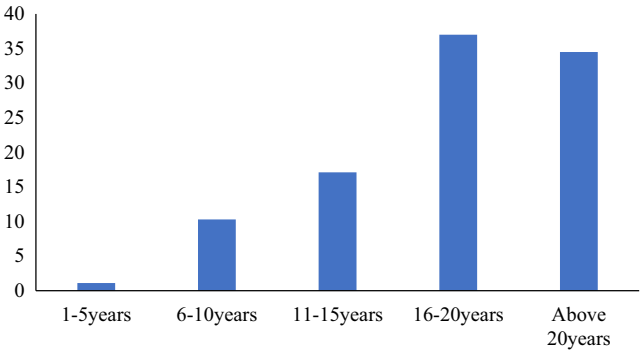
Shown in Figure 3 is the gender distribution of participants. It is important to mention that the level of participation or involvement of the female gender in the Nigerian construction industry is not encouraging. However, advocacy is currently making round by the UN to encourage women's participation all over through concerted efforts by all stakeholders in putting mechanisms in place for such [33]. With a ratio of 12.5% female to 87.5% male counterparts, this should call for concern among industry professionals as the industry is either not gender-friendly or not accommodating enough. Gender-friendly leadership style might serve as a panacea to this anomaly as a comeliness approach from stakeholders tends to woo more females into the industry.

Figure 3
Respondents' sex distribution



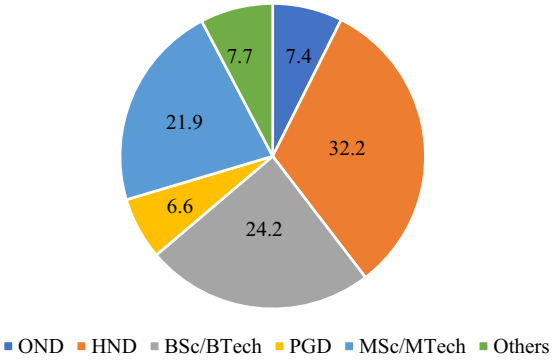
Also, Figure 4 shows more than 80% of the respondents possess above 10 years' cognate experience in the construction industry – an outcome that gives credence to the feedback received.

Figure 4
Years of experience



The level of education possessed by the participants, as displayed in Figure 5, implied high relative prerequisite knowledge of the construction industry, hence the validity of the feedback received.

Figure 5
Respondents' academic qualification



Other demographic features are presented in Table 4.

3.3. Analysis and results

Analysis and ranking of data were done by performing factor analysis on the variables with the aid of SEM with the AMOS software package as used by Tuhul et al. [34] and Aule et al. [35].

3.3.1. Preliminary checks

Data screening was conducted to check for possible characteristics such as missing data (through a review method whereby the source and quality of data were checked), normality, outliers, reliability, and validity (convergent and discriminant validity).

Table 4
Descriptive results of respondents' characteristics

Characteristics	Percentages
Stake in the project	Project manager (33.0%); project team members (33.6%); supervisor (33.4%)
Professional affiliation	NIA (15.4%); NIOB (21.1%); NSE (36.5%); NIQS (15.7%); none (11.4%)
Membership status	Technician (0.7%); licentiate (0.7%); associate (3.4%); graduate (26.5%); corporate (51.9%); fellow (1.44%); none (15.3%)
Construction type	Building (45.4%); road (26.1%); hospitals (6.1%); sport complex (1.9%); others (20.6%)

Livingston [36] and Kennedy [37] recommended conducting a reliability test twice, with 14 days in between among the representatives of the study population to ascertain the reliability of the test instrument. The stability of the result is established during this period as it was performed in two of the three states of the study area. Inner consistency of data was confirmed with the value of Cronbach's alpha coefficient of 0.85–0.95, as shown in Table 5, which shows the test instrument to be highly reliable and consistent. This is above the 0.7 threshold and therefore appropriate for the subsequent statistical procedure.

Table 5
Reliability test for the instrument

Respondents	No of items	Cronbach's alpha
Project managers	83	0.924
Project team member	83	0.885
Supervisor	83	0.894

The data was confirmed as adequate and suitable for factor analysis through Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity before using SEM. The result, as displayed in Table 6, shows the adequacy and suitability of KMO at .885 and the significance of Bartlett's test less than 0.05. Data in factor analysis is said to be adequate when the value of KMO > 0.8, acceptable when > 0.7, and the Bartlett's test < 0.05. With these conditions met, it confirms the suitability of the measurement for performing factor analysis.

Table 6
KMO and Bartlett's test of sphericity

	KMO and Bartlett's test	
Kaiser-Meyer-Olkin measure of sampling adequacy		0.885
Bartlett's test of sphericity	Approximate chi-square	13100.054
	Degree of freedom	351
	Significant	0.000

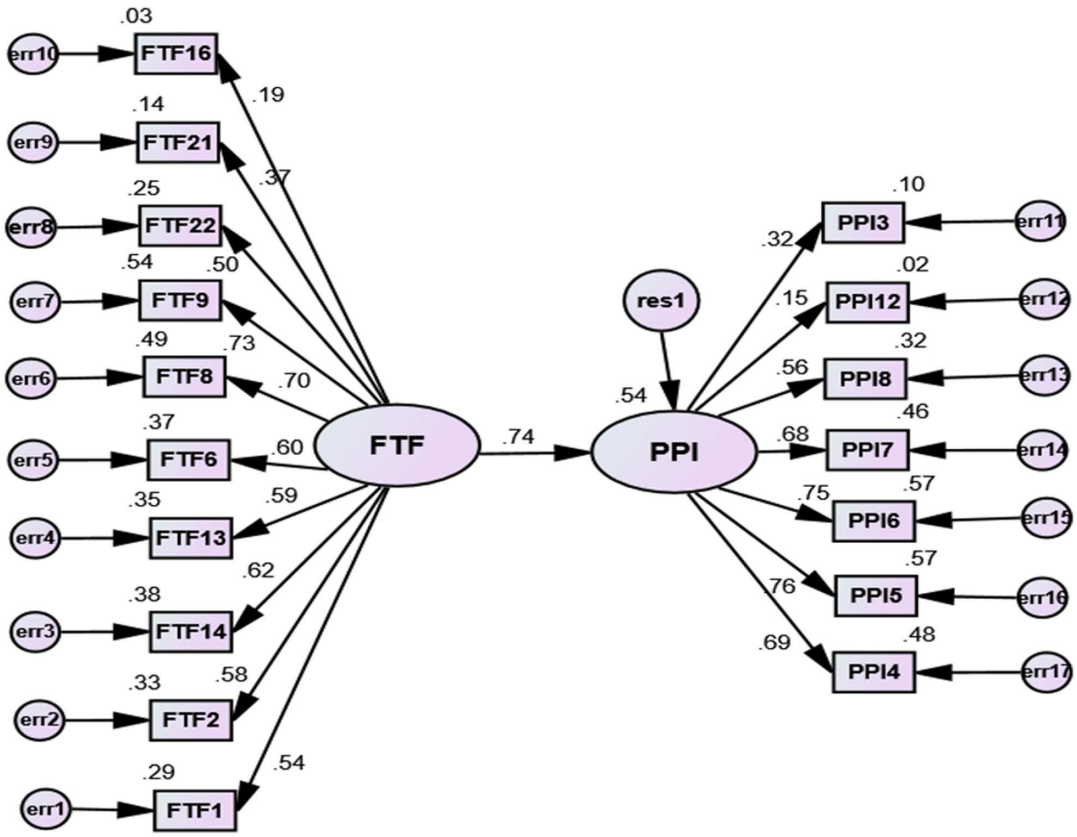
According to Tuhul et al. [34], values, pleasure, self-esteem, accomplishments, and all such are intangible qualities that cannot be directly gauged or quantified but, through SEM, could be evaluated. Kline [38] opined that abstract traits of people or things can be measured effectively on an ordinal scale of measurement. Hence, the use of confirmatory factor analysis (CFA) and SEM as an instrument to test and explore relationships among variables in ordinal scale data [39]. Kline [38] said reference could be made to SEM in some cases as analysis of covariance, usually done in components called orders. These orders are in two phases: the first process is performing CFA known as first order, while the other one is called second-order SEM. During CFA, path diagrams are generated, followed by the loading of factors of constructs. Upon loading these factors, any factor with a coefficient not up to 0.5 is adjudged insignificant and thus removed, as used by previous researchers [16, 17, 35]. Once all threshold conditions are satisfied and goodness of fit (GOF) for the model is achieved, then first-order CFA is complete. The second-order CFA, on the other hand, gives a detailed model by utilizing the SEM result. The scope of the work covers both the first-order CFA and SEM, which were used for testing the postulated hypothesis by establishing the statistical relationship between individual constructs.

Figure 6 depicts the path diagram of the conceptual model as well as the initial SEM model. The strength of the causal relationship between factors of TFLS and PPI was determined by SEM. The path diagram model consists of two latent constructs of TFLS and PPIs with 23 and 12 measurement variables, respectively. Measurement variables of TFLS and PPI are code-named Factors of Transformational (FTFs) and PPIs, respectively. The model fit indices are unsatisfactory, hence subjected to a proper procedure of analysis by SEM, as discussed in the later section.

3.3.2. Exploratory factor analysis and factor extraction model

Exploratory factor analysis (EFA) was performed on factors of TFLS (FTFs) and selected performance indicators (PPIs) to explore the strength of influence among the variables of latent constructs and corresponding indices of measurement. They help to identify factor structure and assess the dimensions of each of the constructs, otherwise referred to as factors. EFA was conducted to ascertain the level of confidence in the measurement model, such that the most feasible model is arrived at during SEM analysis. The outcomes of data screening through skewness and kurtosis reduced the measurement items of TFLS to eighteen (18) and PPIs to nine (9). Hence, EFA was carried out on twenty-seven (27) observed variables. Factor extraction through principal component analysis and the orthogonal model of rotation by varimax were also employed. While the factor extraction procedure helped in ascertaining the underlying significant factors [40, 41], the rotation process displays the loading pattern in such a manner that enables easy interpretation. Relying on the established advantages of orthogonal varimax rotation thus; results that could be highly generalized and with greater tendency of being replicated when placed side by side with the other rotation method (oblique rotation) is generated from it. Also, orthogonal rotation factors are easy to interpret because they are independent (not correlated with each other), unlike oblique rotation with correlated extracted factors [40].

Figure 6
Initial hypothesized path model for the impact of TFLS on project performance



The outcome of the factor extraction model based on eigenvalue greater than one that helped to identify seven variables is displayed in Table 7. These seven variables justified about 64.81% of the total variance in the model. Also, the proposed factor structure was confirmed by using principal axis factoring through varimax rotation. All perceived weak indicators (those with factor loading of less than 0.5) are subsequently dropped. The extraction model has 27 variables, with only 7 extracted.

Table 7
Factor extraction and total variance explained in EFA model

Factor	Initial total	Eigenvalues % of variance	Cumulative %	Extraction total
1	8.936	33.096	33.096	6.035
2	2.102	7.786	40.882	4.897
3	1.679	6.220	47.102	5.922
4	1.371	5.077	52.179	4.479
5	1.276	4.726	56.905	4.111
6	1.090	4.038	60.943	4.910
7	1.045	3.871	64.814	4.611
8	0.985	3.649	68.463	
9	0.835	3.092	71.555	
10	0.809	2.998	74.552	
11	0.755	2.797	77.350	
12	0.691	2.559	79.908	
13	0.626	2.319	82.228	
14	0.595	2.205	84.433	
15	0.536	1.987	86.420	
16	0.516	1.910	88.329	
17	0.468	1.735	90.064	
18	0.449	1.662	91.726	
19	0.397	1.470	93.197	
20	0.301	1.113	94.310	

(*Continued*)

Table 7
(*Continued*)

Factor	Initial total	Eigenvalues % of variance	Cumulative %	Extraction total
21	0.270	1.001	95.311	
22	0.247	0.916	96.227	
23	0.242	0.894	97.121	
24	0.224	0.830	97.951	
25	0.202	0.748	98.699	
26	0.195	0.723	99.422	
27	0.156	0.578	100.000	

Table 8
Results of pattern matrix showing factor loading

Measurement items	Factor structure						
	1	2	3	4	5	6	7
FTF13	0.920						
FTF14	0.871						
FTF15	0.642						
PP11		0.792					
PP12		0.522					
FTF21		0.667					
FTF6			0.820				
FTF8			0.962				
FTF9			0.855				
FTF18				0.842			
FTF19				0.840			
PPI6					0.679		
PPI7					0.881		
PPI8					0.868		
FTF1						0.921	
FTF2						0.931	
PPI4							0.570
PPI5							0.615
PPI11							0.772

3.3.3. Loading of measured variable on latent factors and confirmatory factor analysis (CFA)

The exogenous latent construct of TFLS and project performance indicators have a matrix pattern, as displayed in Table 8. As shown, the loading factor of indicator items loaded relatively high on their constructs, and no cross-loading existed between the constructs. These represent the factors that contribute significantly to the model and are the factors that comprise the first attempt of the measurement model. It reveals a relatively high loading of indicators on the construct, as any loading less than 0.5 is discarded.

Though running SEM on the constructs (latent and observed) is grounded in sound and tested theory, a two-stage procedure was employed in checking the reliability and modification of the measurement model. Before running the final SEM, CFA helps to establish both the level of significance and the causal relationship in the measurement model. CFA enables the evaluation of fit between the already specified hypothesized/path model based on theoretical background and the observed data, such that a well-grounded and valid conclusion is arrived at. The eventual fit model was established by the use of the recommended level of GOF measure [42].

3.3.4. Model specification and estimation

EFA and factor extraction models revealed that only seven factors contributed significantly to the initial model. The same procedure of assessing the measurement model in CFA was adopted: evaluation of conditions for satisfying GOF and those of construct reliability of the measurement model.

The criteria for meeting GOF indices are the three major types of fit measure indices in SEM, namely, absolute, incremental, and parsimonious fit indices. The threshold values for fit measure indices in SEM, as shown in Tables 9 and 10, are maintained [42, 43].

In carrying out CFA on the measurement model, the variables of latent constructs were reduced to twenty-seven (27) factors based on outcome of skewness and kurtosis test, while the seventeen (17) measurement items in the path/hypothesized diagram formed the initial model and then seven factors (7) based on factor extraction represented by pattern matrix in Table 8. The reduction in the number of variables was due to model specification and estimation processes after extraction and rotation. The seven factors are FTF1 – The manager displays power and confidence while administrating project activities; FTF2 – The manager arouses awareness about important tasks and schedules in the project; FTF6 – Paints an interesting picture of the future for team member; FTF8 – Inspires others with his/her plans for the future; FTF9 – Is able to get others committed to his/her dreams of the future that loaded on factor structure 3 and 6 of the pattern matrix; and PPI4 – Lead to improved project team satisfaction, and PPI5 – Increase the level of productivity loaded on factor structure 7 of the same matrix.

Table 9
Model fit indices in SEM

Index measure	Abbreviation	Type of fit	Recommended
Chi-square	χ^2	Model fit	χ^2, df, p >0.05
Normed chi-square	χ^2/df	Absolute fit and parsimony of model	1.0< χ^2/df <5.0
Goodness-of-fit Index	GFI	Absolute fit	>0.90
Root mean square error of approximation	RMSEA	Absolute fit	<0.05 good fit <0.08 acceptable fit
Normed fit index	NFI	Incremental fit	>0.90
Comparative fit index	CFI	Incremental fit	>0.90
Adjusted goodness-of-fit index	AGFI	Parsimonious fit	>0.90

Table 10
Measurement model estimate

Estimates	Recommended values
Factor loading	>0.5 acceptable; >0.7 good
Critical ratio (t-value)	>1.96
Standard residuals	2.58

SEM output for the measurement model shows chi-square statistics to be significant at a 95% confidence level with a p-value less than 0.05, though the postulated hypothesis was supported but not satisfactory to model fit, hence the rejection of the model. Other GOF indices assessment criteria also fell below the threshold values.

3.3.5. Model refinement

Following the aforementioned suggestion and recommendation, model refinement in the form of further review, re-evaluation, and re-specification for improvement of the model was performed. The procedure recommended by Byrne [42] for model refinement states that the factor loading (standard regression weight (SRW)) value should be > 0.5 (acceptable model) or > 0.7 (good model) and squared multiple correlations (SMC) value should be > than the cut-off point 0.25 or 0.5 (for acceptable and good model, respectively). The initial unfit model was subjected to continuous review by first dropping all factors with SRW less than 0.7, and then those less than 0.5 until the penultimate model had seven factors left.

A better model fit was achieved by dropping two factors (FTF1 and FTF2) with a regression value of less than 0.7 to have a final fit model that has three and two measurement items of FTFs and PPIs, respectively. The final fit model depicted by Figure 7 was achieved. Modeling was done many times as items were being substituted and combined with each other to arrive at only five factors used for the final model. This is adequate for SEM analysis as recommended by Byrne [42].

After analysis using SEM, Figure 7 is a display of the structural model showing the path diagram with standardized weights indicated on each of the arrows linking observed variables to their latent construct, together with the direct effect of one variable exact on the other.

The standardized direct effects of the variables are represented by the weight displayed on the arrows. Standardized total effects are the summation of standardized direct and indirect effects. The structural model displayed by Figure 7 reveals a positive direct effect of TFLS on performance indicators. This is based on a positive coefficient of 0.46, indicating the hypothesis is supported. According to the output of SEM analysis and as shown in Table 11, the SRWs for factors of TFLS are relatively high, with ranges 0.68–0.88 higher than the recommended value of 0.5. Also, SMC is greater than the 0.25 lower limit with a 0.901 Cronbach's alpha value above high reliability (0.70–0.90) [37]. In the same vein, the variables of constructs with a p-value less than 0.05 are statistically significant at a 95% confidence level. Assessment of the statistical significance of

Figure 7
Final structural equation modeling for the impact of TFLS on project performance

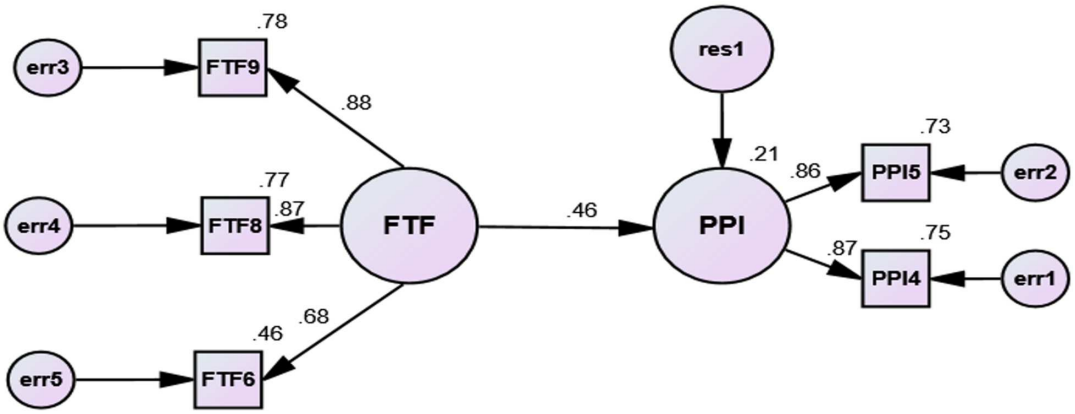


Table 11
Results of SRW, SMC, and reliability of constructs

Code	Variables	SRW	SMC	CR	Cronbach's alpha
FTF6	Paints an interesting picture of the future for team member	0.882	0.778	5.63	0.901
FTF8	Inspires others with his/her plans for the future	0.875	0.765		
FTF9	Is able to get others committed to his/her dreams of the future	0.677	0.458		
PPI4	Lead to improved project team satisfaction	0.867	0.751		
PPI5	Increase the level of productivity	0.856	0.733		
PPI<—FTF		0.46	0.209	0.000	

$P \leq 0.05$

parameter estimates was based on the critical ratio and p-values. The strength of influence of factors of TFLS on performance indicators is explained by the square multiple correlation of each of the variables. PPI with squared multiple correlation of 0.209 shows that 20.9% of the variability in the performance indicators of projects is accounted for by the variables of TFLS. By implication, TFLS improves the selected performance indicators by 20.9%. Therefore, TFLS exacts a tangible impact on the outcome of construction projects in Nigeria.

3.3.6. Model validation and CFA results

Evaluation of unidimensionality and construct validity/reliability was achieved by performing CFA on the measurement model. The validation of model fit was based on the three major recommended goodness of fit indices for SEM being met, as shown in Table 12. The indices are absolute, and incremental and parsimonious fit indices are used as the threshold for validation criteria. The outcome of fit indices for the study in Table 12 reveals the following: Normed chi-square – less than 3 (representing absolute and parsimonious fit); GFI of 0.995 above 0.90 recommended (representing absolute fit); RMSEA of 0.05 less than 0.08 threshold of acceptable fit (representing absolute fit); NFI – 0.994 greater than 0.90 recommended (representing incremental fit); CFI – 0.996 greater than 0.90 recommended (representing incremental fit); AGFI – 0.980 greater than 0.90 recommended (representing parsimonious fit).

Table 12
Final model versus recommended threshold

Abbreviation	Recommended	Initial model	Final model
χ^2	χ^2, df, p >0.05	2370.9	11.509
χ^2/df	1.0< χ^2/df <5.0	23.02	2.877
GFI	>0.90	0.72	0.995
RMSEA	<0.05 good fit <0.08acceptable fit	0.15	0.050
NFI	>0.90	0.60	0.994
CFI	>0.90	0.61	0.996
AGFI	>0.90	0.62	0.980

Kline [38] suggested the necessary steps in achieving better fit indices for SEM, and this was comprehensively followed. Having observed that the conditions for a satisfactory model were not met by the indices of earlier models, further holistic evaluation of the initial model was carried out for rejig, refinement, and re-specification to achieve an improved, better fit. All the paths with a regression load of less than 0.5 were discarded as they did not contribute significantly to the model, and thus, the model fit is validated by the SEM output satisfying the threshold as displayed in Table 9.

4. Discussion of Results and Hypothesis Testing

The objective of determining how TFLS impacts the outcome of construction projects was achieved by examining the effects the measurement indicators of TFLS, known as factors of transformational leadership (FTF), exert on performance indicators (PPI). This enables the project managers to adopt a style that matches their personality, the ethos of their organization, and the nature of the construction projects at hand, as adopting an inappropriate style may result in employees becoming disengaged or demotivated.

The regression weight of 0.46 shows that TFLS has a direct/positive influence on the outcome of projects in Nigeria and the initial hypothesis is supported. This is in agreement with earlier literature by Oyaya [44] and Aga et al. [25] who have found TFLS suitable in Kenya and Ethiopia's construction industry, respectively. However, Oyetunji et al. [6] and Olasunkanmi et al. [13] had attested to the usage of TFLS in the Nigerian construction sector as canvassed and suggested by Oke (2013) and Ayangade et al. [45]. They both argued that the adoption of TFLS would be most impactful to project performance in Nigeria.

The model fit in Table 12 has all values within the recommended limit and is therefore adjudged satisfactory. The statistical significance of parameter estimates, critical ratio (CR), and P-values was assessed using the test statistics. Unlike the transactional leadership style, the CR value of 5.63 shows the relatively high influence of TFLS on all the indicators of performance. The general p-value and those of individual variables that contribute significantly to the model are less than 0.05. This implies significance at a 95% confidence level of all the estimates. An observation of the structural model as depicted in Figure 7 shows three indicator variables: FTF6 – Paints an interesting picture of the future for team member; FTF8 – Inspires others with his/her plans for the future; and FTF9 – Is able to get others committed to his/her dreams of the future, with very high regression weight. These represent the most treasured attributes of transformational leadership, where the leader enjoys good followership from the subordinate. PPI4 – improved project team satisfaction and PPI5 – increased level of productivity as the major aspect of success indicators in the model affected by TFLS have far-reaching consequences on overall performance. They both have the potential of leading to higher overall project cost and delayed delivery.

The postulated hypothesis represented by path link PPI<—FTF in Table 11, which states that TFLS has a significant effect on the performance of construction project, is hereby supported and accepted. The CR value of 5.63 and other test statistical criteria supported and validated the hypothesis, premised upon the fulfillment

of the conditions stated in Tables 9 and 10. According to Byrne [42] and Hair et al. [43], upon satisfaction of the model fit indices with all variables statistically significant with $p \leq 0.05$ and at a high confidence level of 95%, the hypothesis stands accepted.

The findings of this survey provide a congruent and contrast position to the outcome of previous research as the case may be. The result is in tandem with the submission of Tyssen et al. [46] in Austria, Germany, and Switzerland and Liphadzi et al. (2015) in South Africa, where TFLS was positively correlated with project performance. The reverse was the case by Kariuki [47] in Kenya, all components of TFLS exerted a negative impact on the entire project's success. A recent meta-analytic review by Abbas and Ali [48] highlighted the effect of TFLS on project success but concluded on the imperativeness of moderating variables to ensure the optimum benefit of the chosen style.

5. Conclusion and Recommendation

The SEM approach has been used in verifying the strength of connectivity and influence within the model's constructs. The consensus based on the outcome is the existence of a positive and direct relationship. Therefore, TFLS exerts a significant effect on the outcome of construction projects in Nigeria. It is worth noting that three variables of TFLS have a relatively high regression weight, which is a departure from others: Paints an interesting picture of the future for team member; Inspires others with his/her plans for the future; and Is able to get others committed to his/her dreams of the future.

On the usage of factors of TFLS, the study concludes that there is positive and high influence on performance but singled out some factors. Conclusively, Paints an interesting picture of the future for team member, Inspires others with his/her plans for the future, and Is able to get others committed to his/her dreams of the future are factors believed to be pivotal to the successful delivery of projects. These factors align with the people-oriented virtue of TFLS, according to Ceri-Booms et al. [49] and Koe slag-Kreunen et al. [50], which enables PTMs to leverage their relationship with the project leader to achieve enhanced project success.

The findings show that TFLS improves performance by about 21% within the Nigerian industry. The charismatic (idealized) influence and inspirational motivation of TFLS are to be employed to ensure team member satisfaction during the execution of the project to enhance their level of productivity, without which, the project suffers the dire consequences of doing otherwise. Schedule and cost overruns might result, which is a snare to the entire project's stakeholders. Therefore, the construction stakeholders could imbibe these factors that contribute significantly to the model to eliminate age-long performance issues associated with project delivery across the globe. The survey, among others, had leveraged the multivariate approach through SEM to extract the exact component of TFLS advantageous to construction projects and the particular areas of success indicators that require attention, which had hitherto been neglected before now. The emphasis of this survey's significance is in the revelation of the construct's predicted and predictor variables that constituted the final model, which are usually not given relevance in the course of project execution, though loaded with the possibility of causing project failures. Thus, the contribution of this survey finding to extant project management literature with attendant implications for PMs.

With respect to the outcome of this study, it is therefore recommended as follows:

1. Construction managers in Nigeria can adopt components of TFLS with any other style deemed to be beneficial.

2. Efforts should be made by conducting research to unravel the reason for the low involvement of female gender in construction activities in the Nigerian construction industry.

This survey adopted a cross-sectional approach to arrive at the findings. It is thus recommended to undergo the same in a future study on a longitudinal basis and extend the scope to other regions for wider coverage for generalization of findings. Additionally, more contexts should be introduced to further study on TFLS to further deepen the understanding of leadership as a genre of project management discourse.

6. Limitations of the Study

Regardless of the important contribution of the survey, there are lapses in the form of limitations. Introducing some mediating variables such as team commitment or moderating variable of organizational culture could probably influence the interactions between the constructs, thereby providing a new orientation for the mechanism of interactions. Geographical limitation is also hampering comparison, thereby making the generalization of findings not optimal, therefore, the essentiality of widening the study coverage to achieve this.

Ethical Statement

This study does not contain any studies with human or animal subjects performed by any of the authors.

Conflicts of Interest

The authors declare that they have no conflicts of interest to this work.

Data Availability Statement

Data available on request from the corresponding author upon reasonable request.

Author Contribution Statement

Femi-Favor Olabode Olasunkanmi: Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing, Visualization, Project administration, Funding acquisition. **Dubem Isaac Ikediashi:** Validation, Resources, Supervision. **Jacob Atser:** Formal analysis, Data curation. **Emmanuel Chongcicimmi Ibrahim:** Software.

References

[1] Sampaio, S., Wu, Q., Cormican, K., & Varajao, J. (2021). Reach for the sky: Analysis of behavioral competencies linked to project success. *International Journal of Managing Projects in Business*, *15*(1), 192–215.

[2] Olasunkanmi, F. O., Ikediashi, D. I., & Ajiero, I. R. (2023a). Assessing the factors of transactional leadership styles for construction projects: A case of Nigerian construction Industry. *Journal of Engineering Design and Technology*,. *22*(2), 1637–1654, https://doi.org/10.1108/JEDT-01-2022-0012

[3] Rehman, S. U., Shahzad, M., Farooq, M. S., & Javaid, M. U. (2020). Impact of leadership behavior of a project manager on his/her subordinate's job-attitudes and job-outcomes. *Asia Pacific Management Review*, *25*(1), 38–47.

[4] Mansour, A., Al-Qudah, S., Siam, Y., Hammouri, Q., & Hijazin, A. (2024). Employing E-HRM to attain contemporary organizational excellence at the Jordan social security corporation. *International Journal of Data and Network Science*, *8*(1), 549–556.

[5] PMI. (2021). *A guide to the project management body of knowledge: PMBOK, Guide* (7th ed.). USA: Project Management Institute.

[6] Oyetunji, A. K., Adebiyi, J., & Olatunde, N. A. (2019). Leadership behaviour and worker performance in the Nigeria construction industry. *The Journal of Value-based Leadership*, *12*(2), 13.

[7] Ali, M., & Rasheed, F. (2021). Transformational leadership and project success: The mediating role of effective – communication. In *Conference Proceeding of International Colloquium on Interdisciplinary Research in Hindukush*. Karakoram Himalaya (HKH) Region (ICIR-HKH-2021)

[8] Pinto, J. K., Davis, K., Ika, L., Jugdev, K., & Zwikael, O. (2021). Call for papers for special issues on project success. *International Journal of Project Management*, *39*, 213–215.

[9] Arnaiz, F., Alvarez, V., Montequin, V., & Cousillas, S. (2022). Identifying critical success factors in continuous improvement projects in a steel company. *Procedia Computer Science*, *196*, 832–839.

[10] El Khatib, M., Kherbash, A., Al Qassimi, A., & Al Mheiri, K. (2022). How can collaborative work and collaborative systems drive operational excellence in project management? *Journal of Service Science and Management*, *15*(3), 297–307.

[11] Rehan, A., Thorpe, D., & Heravi, A. (2024). Leadership practices and communication framework for project success: The construction sector. *Organization, Technology and Management in Construction*, *16*, 204–223. https://doi.org/10.2478/otmcj-2024-0016

[12] Oke, E. A. (2013). Project management leadership styles of Nigerian construction professionals. *International Journal of Construction Project and Management*, *5*(2), 159–169.

[13] Olasunkanmi, F. O., Ikediashi, D. I., & Belonwu, C. C. (2023b). The factors of transformational leadership style for construction projects: A case of Nigerian construction industry. *Journal of Emerging Technologies and Innovative Research*, *10*(8), 523–537.

[14] Management Adda. (2021). *Leadership theories [Video file]*. Retrieved from: https://youtu.be/WOtBp0D85LI

[15] Ali, M., Li, Z., Khan, S., Shah, S. J., & Ullah, R. (2020a). Linking humble leadership and project success: The moderating role of top management support with mediation of team-building. *International Journal of Managing Projects in Business*, *14*, 545–562.

[16] Alaloul, W. S., Liew, M. S., Zawawi, N. A. W., Mohammed, B. S., Adamu, M., & Musharat, M. A. (2020). Structural equation modelling of construction project performance based on coordination factors. *Cogent Engineering*, *7*(1), 1726069. https://doi.org/10.1080/23311916.2020.1726069

[17] Unegbu, H. C. O., Yawas, D. S., & Dan-asabe, B. (2020). Structural equation model of the relationship between project performance measures and the critical success factors of construction projects: A case of the Nigerian construction industry. *Jurnal Mekanikal*, *43*, 33–51.

[18] Ssenyange, K., & Kudakwashe, C. (2023). Impact of leadership styles on government construction project success: A structural equation modeling approach. *Journal of Construction Business and Management*, *12*(2), 11–26.

[19] Sethole, T. G. (2020). *The impact of leadership styles on team performance in information communication technology projects*. Doctoral Dissertation, Cape Peninsula University of Technology.

[20] Hanandeh, A., QaisHammouri, D. R., & Hanandeh, R. (2021). Outsourcing and job performance: The perspectives of organizational structure and culture. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *12*(6), 4378–4387.

[21] Jarad, G. H. (2012). *The construction manager leading characteristics for the success of construction projects in the Gaza Strip*. Master Thesis, The Islamic University of Gaza.

[22] Gębczyńska, M. (2020). Leadership and project success in project-based organization: A fuzzy-set analysis. *Organization and Management Series*, *138*, 42–56.

[23] Liphadzia, M., Aigbavboab, C., & Thwala, W. (2015). Relationship between leadership styles and project success in the South Africa construction industry. *Procedia Engineering*, *123*, 284–290. https://doi.org/10.1016/j.proeng.2015.10.091

[24] Amin, S., Kamal, Y., & Sohail, A. (2016). The relationship between transformational leadership and project team performance: Assessing the mediating role of a project team management education. *Apeejay Journal of Management Science and Technology*, *3*(3), 1–12.

[25] Aga, D., Noorderhaven, N., & Vallejo, B. (2016). Transformational leadership and project success: The mediating role of team building. *International Journal of Project Management*, *34*, 806–818.

[26] Zaman, U., Nawaz, S., Tariq, S., & Humayoun, A. A. (2019). Linking transformational leadership and "multi-dimensions" of project success: Moderating effect of project flexibility and project visibility using PLS-SEM. *International Journal of Management Project Business*, *13*(1), 103–127.

[27] Fareed, M. Z., & Su, Q. (2021). Transformational leadership and project success: A mediating role of public service motivation. *Administration & Society*, *54*(4), 690–713.

[28] Ali, H., Chuanmin, S., Ahmed, M., Mahmood, A., Khayyam, M., & Tikhmirova, A. (2021). Transformational leadership and project success: Serial mediation of team building and team work. *Frontiers in Psychology*, *12*, 3698.

[29] Hannay, M. (2013). The cross –cultural leader: The application of servant leadership theory in international context. *Journal of International Business and Cultural Studies*, *5*, 14–26.

[30] Graen, G. B., & Uhl-Bien, M. (1995). Relationship-based approach to leadership: Development of leader-member exchange (LMX) theory of leadership over 25 years. Applying a multi-level multi-domain perspective. *The Leadership Quarterly*, *6*(2), 219–247.

[31] Olasunkanmi, F. O., & Belonwu, C. C. (2023). The perceived level of compliance of construction projects with performance indicators in Nigeria. *International Journal of Research and Innovation in Social Science*, *8*(10), 274–289.

[32] Nowlis, S., Kahn, B. E., & Dhar, R. (2022). Coping with ambivalence: The effect of removing a neutral option on consumer attitude and preference judgments. *Journal of Consumer Research*, *29*(3), 319–334. https://doi.org/10.1086/344431

[33] Jwasshaka, S. K., & Amin, N. F. (2020). Gender discrimination in building construction industry in Nigeria: Threat to achieving goal – 5 Of Vision 2030. *World Journal of Engineering and Technology*, *8*, 33–41. https://doi.org/10.4236/wjet.292.81004

[34] Tuhul, H. S., El-Hamouz, A., Hasan, A. R., & Jafar, H. A. (2021). Development of a conceptual framework for occupational safety and health in Palestinian manufacturing industries.

International Journal of Environmental Research and Public Health, *18*(3), 1338. https://doi.org/10.3390/ijerph18031338

[35] Aule, T. T., Majid, R. B. A., & Jusan, M. B. M. (2022a). Exploring cultural values and sustainability preferences in housing development: A structural equation modeling approach. *Scientific Review Engineering and Environmental Studies*, *31*(3), 149–160.

[36] Livingston, S. A. (2019). *Test reliability—Basic concepts, educational testing service, ETS research memorandum series* (p. 38). USA: Princeton.

[37] Kennedy, I. (2022). Sample size determination in test-retest and Cronbach alpha reliability estimates. *British Journal of Contemporary Education*, *2*(1), 17–29.

[38] Kline, R. B. (2016). *Principles and practices of structural equation modelling* (4th ed.). Retrieved from: www.guilford.com

[39] Achoba, M. I., Majid, R. B. A., & Obiefuna, C. O. (2021a). Relationship between window and view factors in the workplace: A SEM approach. *International Journal of Built Environment and Sustainability*, *8*(2), 103–113.

[40] Gabriel, K. C. (2019). Oblique versus orthogonal rotation in exploratory factor analysis. *International Journal of Research and Scientific Innovation (IJRSI)*, *6*(9), 212–216.

[41] Greenacre, M., Groenen, P. J. F., Hastie, T., Iodice d'Enza, A., Markos, A., & Elena Tuzhilina, E. (2022). Principal component analysis. *Nature Reviews Methods Primers*, *2*(1), 100–123. https://doi.org/10.1038/s43586-022-00184-w

[42] Byrne, B. M. (2010). *Structural equation modelling with amos: Basic concepts, applications and programming* (3rd ed.). USA: Routledge.

[43] Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24.

[44] Oyaya, O. W. (2017). *Influence of leadership style on performance of construction projects: A case of housing projects in Westlands Sub-Country*. MA Thesis, University of Nairobi.

[45] Ayangade, J. A., Aina, O. O., Omojola, S. O., & Odubanjo, M. (2017). Leadership style of selected construction managers in Nigeria. *British Journal of Environmental Sciences*, *5*(4), 1–10.

[46] Tyssen, A. K., Wald, A., & Spieth, P. (2014). The challenge of transactional and transformational leadership in projects. *International Journal of Project Management*, *32*(3), 365–375.

[47] Kariuki, J. (2015). *Project manager leadership style, teamwork, project characteristics and performance of water projects in Kenya*. Doctoral Dissertation, University of Nairobi. Retrieved from

[48] Abbas, M., & Ali, R. (2023). Transformational versus transactional leadership styles and project success: A meta-analytic review. *European Management Journal*, *41*, 125—142. https://doi.org/10.1016/j.emj.2021.10.011

[49] Ceri-Booms, M., Curs¸eu, P. L., & Oerlemans, L. A. (2017). Task and person-focused leadership behaviors and team performance: A meta-analysis. *Human Resource Management Review*, *27*(1), 178–192.

[50] Koeslag-Kreunen, M., Van den Bossche, P., Hoven, M., Van der Klink, M., & Gijselaers, W. (2018). When leadership powers team learning: A meta-analysis. *Small Group Research*, *49*(4), 475–513.

How to Cite: Olasunkanmi, F. F. O., Ikediashi, D. I., Atser, J., & Ibrahim, E. C. (2025). Modeling the Impact of Transformational Leadership Style on Construction Project Performance. *Journal of Comprehensive Business Administration Research*. https://doi.org/10.47852/bonviewJCBAR52024878