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The Influence of Construction Project Team Effectiveness in Higher Institutions' Building Projects: A Case from Nigeria

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Abstract

Projects are required to meet the stakeholders' requirements on the stipulated time, quality and budget. The achievement of such requirements is related to team effectiveness. However, there is poor project time and cost performance in Nigeria such that the constructions initiated mostly escalate beyond the cost and time budgeted. The construction project teams in Nigeria are shrouded with dysfunctions leading to undesirable project outcomes. This study aims to examine the influence of project team effectiveness on project performance of higher educational institutions' construction in Nigeria. A quantitative survey design was employed where 150 questionnaires were administered to construction projects team members in four higher educational institutions in Bauchi state, Nigeria. The result indicated that the team effectiveness factors of communication, role and responsibility as well as team relationships have a substantial influence on project performance. However, goal and objectives, leadership, as well as trust and values factors, do not have significant influence. Overall, the result shows that the variation in the project performance can be explained substantially by changes in the construction project team effectiveness (Adj. R^2 =.585). The implication of this finding is that project performance in Nigerian higher educational institutions can be significantly improved by strengthening communications, roles and responsibilities as well as relationships among team members. Thus, this research contributed to the existing body of knowledge on the linkage between team effectiveness and project performance in the Nigeria higher educational institutions' construction projects. The study, therefore, recommended the improvement of team effectiveness factors of the industry by all projects' stakeholders and participants.

Keywords: Project, team effectiveness, cost performance, time performance, construction

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1.0 INTRODUCTION

The major objective of every client is the completion of his/her construction project within the stipulated cost and time. The achievement of this objective is called project performance. Project performance (PP) is the extent to which projects are delivered based on the requirements of the clients. These requirements include completing the project within budgeted cost, stipulated time, and agreed quality (Fung & Ramasamy, 2015). Project success are mostly and fundamentally determined using time and cost performance criteria (Rahman et al., 2012). However, researchers like Ogunde et al. (2017) and Auma (2014) have reported poor performance of construction projects across the world. Incidentally, developing countries (including Nigeria) have a higher rate of poor performance of projects than developed countries (Lepartobiko, 2012). It is reported that over 70% and 50% of the construction projects started are likely to exceed the time and cost budgeted with a magnitude of over 50% and 20% respectively (Okweto, 2012). These result in decrease in construction activities, project abandonment, contractors' profit loss, deficit budget, ruining the image of professionals, dwarfing the economic growth of the nation, delays, frustrations among the stakeholders, and resultant inflation to the final consumer of the projects (Olatunji et al., 2016; Prajapati et al., 2016). According to Lepartobiko (2012), the outcome of these can lead to litigations which are lengthy and costly.

The performance of a construction project depends on many factors. Among the reasons of poor performance of projects include the inability of project participants (team) to work collaboratively (Al-Dosary et al., 2009; Assaf & Al-Hejji, 2006; Assaf et al., 2013, 2014; Azmy, 2012; Bubshait & Al-Juwairah, 2002; Evbuomwan & Anumba, 1998; Homthong & Moungnoi, 2016; Khoshtale & Adeli, 2016). Another important project performance determinant is the project team effectiveness (Dalal, 2012; Kerzner & Saladis, 2013).

Construction project team effectiveness is defined as the capability of the team members to collaborate flexibly, assisting one another. Teams member perform their functions effectively through enormous effort to solve whatever issue that may arise to achieve project success by completing the work on time, given cost and quality (Azmy, 2012). To establish effective teams, conflicts must be minimised among the team members through cordial working relationships to achieve substantial success (Azmy, 2012; Demkin, 2008). Despite the importance of project team effectiveness on project performance, it is still shrouded with many obstacles, particularly in the educational

sectors of the developing nations. In the Nigerian construction industry, there is poor leadership, professional rivalry, poor rapport, disrespect, distrust as well as severe lack of collaboration and commitment among teams participants which worsens the culture of effective teamwork leading to ineffective and poor team management (Adu & Opawole, 2020; Mukhtar et al., 2021; Ogundipe et al., 2018; Zailani et al., 2019). Another issue is poor communication among team members (Oni, 2020). Other problems of team effectiveness in the Nigerian construction industry identified by Obodoh and Obodoh (2016) include competition among the team members, complaints and blame games, insubordination, arrogance among professionals, miscommunication, conflicts and diverse perspectives among members. Miscommunication is a serious problem affecting team members (Ejohwomu et al., 2017; Ogunde et aal., 2017; Okoye et al., 2015; Zailani et al., 2019).

Though the influence of project team effectiveness on project performance has been studied in other climes (Assaf et al., 2014; Azmy, 2012; Dalal, 2012; Gaikwad, 2016; Kerzner & Saladis, 2013; Khoshtale & Adeli, 2016), fewer studies were conducted in Nigeria (Adu & Opawole, 2020; Ogundipe et al., 2018). There is also significantly few studies in the Nigerian higher educational institutions on the subject matter even though a substantial volume of formal public constructions are in the sector with a substantial magnitude of project overruns of about 100% (Mukhtar et al., 2021). The existing studies also were mostly descriptive without in-depth inferential testing of the causal link between project team effectiveness and project performance. Another limitation is the lack of related studies in the northeastern region of Nigeria. The outcome of similar studies in other regions may not be generalized to northeastern Nigeria due to obvious socio-demographic differences. This is because the northeastern region has been plagued with Boko Haram insurgency which affected the provision of public infrastructure in the region.

This research addressed the identified gaps by determining the influence of team effectiveness factors on project performance in higher educational institutions in northeastern Nigeria. The aim was achieved by addressing the specific research objectives which include the assessment of the level of project team effectiveness; the evaluation of the construction project performance; and determining the effect of project team effectiveness on project performance. This was achieved using quantitative research techniques.

2.0 LITERATURE REVIEW

Teamwork is a feature of the construction industry where construction projects are delivered by various professionals as a team. These professionals include architects, quantity surveyors, builders, material suppliers, engineers, land surveyors, contractors, planners, specialists and all other professionals involved in delivering construction projects (Assaf et al., 2014). The benefit that can be derived from the effective performance of construction projects among others includes improved technology of the nation, an extension of infrastructures, lessening adversarial relationship among project participants, increase employment opportunities, and government expenditure and trade diversification (Olatunji et al., 2016). The project team factors are discussed in the following subsections.

2.1 Project Effectiveness Factors

2.1.1 Project Team Goals and Objectives

To achieve the desired project time effectiveness, setting the goals and objectives for the team is paramount. This is because clear goals and objectives are important project success elements (Dinsmore & Cooke-Davies, 2006; Rad & Levin, 2003). Goals play an important role in defining the scope of work which when understood increase team and project success (Parker, 2008). Camilleri (2011) stated that employee commitment and participation at all levels to achieving goals and objectives are the significant determinants of project success. When the goals and objectives of the team are clearly defined, the entire team will be working together for the achievement of the common goal. Failure to have this, the team may be working fragmentally and therefore ineffective.

2.1.2 Project Team Leadership

Leadership is the greatest trait that enables leaders to convince the team stakeholders for effective team work for the achievement of project objective in challenging project environment (Anantatmula, 2010; Juli, 2010; Keller, 1992). The personality and the leadership style exhibited by leaders and their management skills are very important for effective project delivery (Camilleri, 2011). Similarly, Acharya et al. (2006) noted that to achieve team effectiveness with desirable interpersonal relations, leadership is the key element, with resultant outcome of project success. In a nutshell, effective leadership is considered a prerequisite for project team effectiveness (Adu & Opawole, 2020).

2.1.3 Project Team Roles and Responsibility

Roles and responsibilities are important factors of team effectiveness. Project success could be improved when there is the specific roles and responsibilities of the team members are clear to them and they are matched to the area of expertise (Camilleri, 2011; Pratt, 2010). When members have the available resources they need, their responsibility is clearly defined and understood, construction project success can be guaranteed (Cobb, 2012). For ease of coordination and stability of the team, roles and responsibilities must be carefully defined and clear devoid of ambiguity (Choi, 2002; Molleman et al., 2004). Camilleri (2011) stated that employee commitment to their roles and responsibility is a significant factor of construction project success.

2.1.4 Project Team Relationship

The relationship among team members is an important effectiveness factor. A team that has cordial relationship among members, honesty, openness, trust, respect, team innovativeness, cooperative attitude and collaborative behaviour tend to have good team effectiveness and therefore improved project performance (Stevens & Campion, 1994). Hence, team relationship is greatly necessary for effective project teams.

2.1.5 Trust and Value within the Project Team

When team members communicate with one another openly, value and trust one another, the tendency of conflict among them is greatly minimised while improving the level of understanding among them (Ensley et al., 2002). Teams that members value and trust one another, as well as cooperative tendencies, mostly achieve their set goals and objectives effectively (Hartenian, 2003).

2.1.6 Project Team Communication

Understanding among team members is facilitated by proper communication. Communication ensure that team members understand one another which enables them value and trust one another leading to collaboration among themselves needed for project success. Project performance is reported in literature to be greatly influenced by team communication (Ejohwomu et al., 2017). Project success has been reported to have strong link with effective communication has been strongly linked with project success (Clutterbuck, 2007; Hernon & Rossiter, 2007; Rad & Levin, 2003; Williams, 2002).

2.1.7 Company/Top Management Support

Top management refers to the leaders working in higher-level positions in organizations. Top management must provide the needed support to the project team for it to be effective (Haque & Anwar, 2012). The top management normally provide the leadership role during project implementation (Talib et al., 2011). It has been noted earlier that leadership is necessary for effective project team. Such leadership support include finance, resources, authority, and all support needed by the team for the success of the project execution (Shah et al., 2011). The success or otherwise of construction projects largely rely on the level of support by top management to the team (Iram et al., 2016). Therefore, top management must provide the needed support for the team to be effective and successful (Azmy, 2012; Gaikwad, 2016).

2.1.8 Creativity and Innovation

Creativity and innovation are important for successful teamwork. Projects are complex and therefore required innovation and creativity to adapt to changing client requirement. Team members are therefore required to exhibit high level of innovation and creativity to attain project success (Azmy, 2012; Oke & Ukaeke, 2013). Creativity is powered every revolution that modifies the way projects are conceived, scheduled and executed. Thus, innovation and creativity are primary ingredients for engendering productivity and improvement among team members (Gaikwad, 2016).

2.1.9 Team/Task Process

Effective team require systematic task processes and proper team planning (Azmy, 2012). Construction project comprises numerous task necessary to complete a project. These task are performed at various stages of the construction – before construction, during construction, and after construction. These task needs to be systematically and property planned and executed to ensure that materials are not wasted, time is not lost, and quality is not compromised. The team must also be properly planned to ensure that team members perform their duties at planned phase. The task process and team planning guarantee the client's required standard and project success (Azmy, 2012).

2.1.10 Audit and Monitoring

Auditing is an important tool use to monitor and control construction activities. It ensures that corrupt and fraud tendencies are identified and eliminated among team members. This therefore saves the cost of the project leading to improved project performance. Auditing and monitoring in construction safeguard the financial position of the project therefore strengthening the relationship between the client, contractor and the team members (Onyeagam et al., 2019). Team auditing and monitory can also serve as employee performance appraisal which provide information about the performance of the team members and the improvements needed to achieve the required project success (Oke & Ukaeke, 2013).

2.2 Review of Empirical Literature

Empirical researches have been conducted to determine the factors of effective team. For instance, Gido and Clements (2011) found that effective teams have certain features which include ethical behaviour, trust, high degree of cooperation, open and effective communication. These features contribute significantly to project success. Other studies found that effective communication, management of conflict, setting goals and objectives, cordial relations among team members, trust among team members are important determinants of construction project success (Dalal, 2012; Kerzner & Saladis, 2013).

An Indian study in Pune by Gaikwad (2016) investigated the factors of effective team or otherwise in construction projects and found that healthy conflict amongst the team member is an important determinant of time performance. Cost performance on the other hand is determined by team accountability. Assaf et al. (2014) investigated the impact of project team effectiveness on the performance of construction projects in Saudi Arabia and found that an increase in project success is associated with an increase in team effectiveness. The finding further show that team goal and objectives, team role and responsibilities, as well as team leadership are the team effectiveness factors that have significant influence on projective performance in Saudi Arabia.

Similarly, in Iran, Khoshtale and Adeli (2016) determined the relationship between project performance and team effectiveness factors. The result of the study found that team relationship, team roles and responsibilities, team leadership, values and trust are the most important determinants of project performance. The study of Azmy (2012) also found team leadership as determinant on project change management. Hence, there exists a significant difference in contextual characteristics between developed and developing countries (Kurnia et al., 2015).

Studies in Nigeria like those from Odusami et al. (2003), Ameh and Odusami (2014) and Olatunde et al. (2017), all concentrated on team composition and leadership within the project team. Furthermore, Ekung et al. (2015) focused on leadership traits on team performance of construction projects. Moreover, a closely related study by Oke and Ukaeke (2013), considered factors responsible for effective and ineffective teams in the Nigerian construction industry. However, all the above studies in Nigeria were short of relating team effectiveness factors with project performance. A matrix of related studies is provided in Table 1.

Table 1 A matrix table showing factors from different studies conducted

S/N	Factors	Cost	Time
1	Project team goals and objectives	Assaf et al. (2014); Azmy (2012); Khoshtale and Adeli (2016)	Assaf et al. (2014); Azmy (2012); Khoshtale and Adeli (2016)
2	Project team leadership	Assaf et al. (2014); Azmy (2012); Khoshtale and Adeli (2016)	Assaf et al. (2014); Azmy (2012); Khoshtale and Adeli (2016)
3	Project team roles and responsibility	Assaf et al. (2014); Azmy (2012); Gaikwad (2016); Khoshtale and Adeli (2016)	Assaf et al. (2014); Azmy (2012); Gaikwad (2016); Khoshtale and Adeli (2016)
4	Project team relationship	Assaf et al. (2014); Azmy (2012); Gaikwad (2016); Khoshtale and Adeli (2016)	Assaf et al. (2014); Azmy (2012); Gaikwad (2016); Khoshtale and Adeli (2016)
5	Trust and value within the project team	Assaf et al. (2014); Azmy (2012); Gaikwad (2016); Khoshtale and Adeli (2016)	Assaf et al. (2014); Azmy (2012); Gaikwad (2016); Khoshtale and Adeli (2016)
6	Project team communication	Assaf et al. (2014); Azmy (2012); Khoshtale and Adeli (2016)	Assaf et al. (2014); Azmy (2012); Khoshtale and Adeli (2016)
7	Creativity and Innovation	Azmy (2012); Gaikwad (2016)	Azmy (2012); Gaikwad (2016)
8	Team/Task processes	Azmy (2012); Oke and Ukaeke (2013)	Azmy (2012); Oke and Ukaeke (2013)
9	Top management support	Azmy (2012); Gaikwad (2016)	Azmy (2012); Gaikwad (2016)
10	Audit and monitoring	Azmy (2012); Gaikwad (2016)	Azmy (2012); Gaikwad (2016)

Based on the previous literature, the conceptual framework of the research is presented in Figure 1.

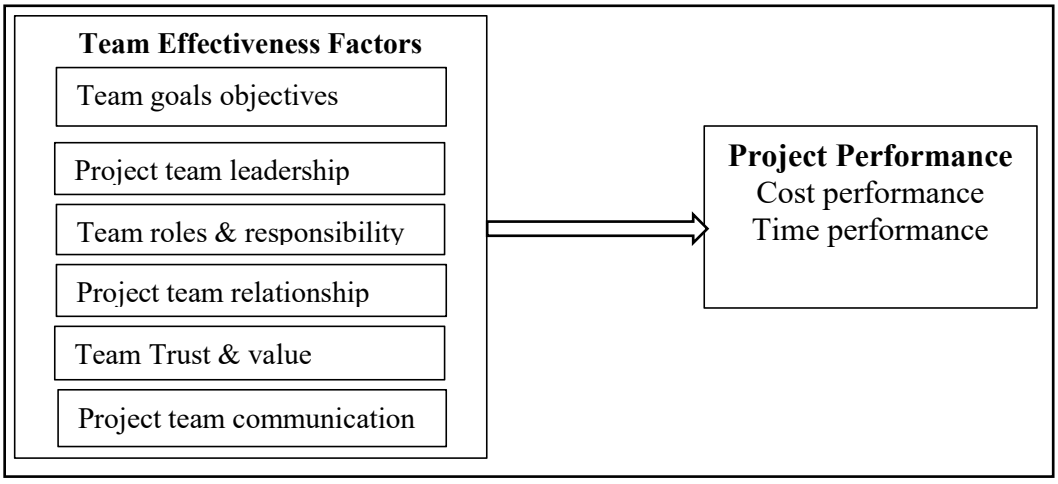

Figure 1 Conceptual framework of the study

Figure 1 is the conceptual framework developed for the research based on the interrelationship between the team effectiveness factors and the project performance. The review indicated that having defined goals and objectives for the project team improves project success (Camilleri, 2011). Effective leadership was also identified as a significant determinant of project performance (Adu & Opawole, 2020).

Defining roles and responsibilities for team members minimizes the chances of rivalry and conflict among team members which improves the project outcome (Cobb, 2012). Good relationships among team members coupled with clear communication also improve project performance (Adu & Opawole, 2020; Ogundipe et al., 2018). When team members trust one another and value their engagement, they are most likely to be highly committed to the project thereby leading to project overall success (Ejohwomu et al., 2017). The top management support, creativity and innovation, task process, and auditing and monitory are not direct team effectiveness factors but interact with them to affect project performance (Oke & Ukaeke, 2013; Okereke et al., 2022). Hence, the factors are not included in the framework. Thus, this paper conceptualized that team goals and objectives, team leadership, team relationship, team roles and responsibilities, trust and values within the project team and communication factors have a direct and positive influence on project performance.

3.0 METHODOLOGY

3.1 Research Design

This study employed a quantitative research design: exploratory and descriptive. Exploratory design reviewed related literature to justify the existence of the problem and related research in the field of the project team and project performance of building projects. The descriptive design collected information regarding project team effectiveness and project performance through a questionnaire (field survey).

3.2 Population of the Study

The target population of the study comprised of clients' team members, consultants' team members and contractors' team members (Quantity Surveyors, Architects, Builders, Civil /Structural Engineers, Electrical and Mechanical Engineers) of an ongoing project in four (4) tertiary institutions in Bauchi State (Abubakar Tafawa Balewa University Bauchi, Bauchi State University (Bauchi Campus), Abubakar Tatari Ali Polytechnic Bauchi and Federal Polytechnic Bauchi).

3.3 Sample Frame

This is the source of material from which a sample is drawn for research work. The sample frame of the study was one hundred and seventy-eight (180) construction professionals that serve as team members. The team members were 83 in Abubakar Tafawa Balewa University Bauchi, 19 in Bauchi State University, 30 in Abubakar Tatari Ali Polytechnic Bauchi and 46 in Federal Polytechnic Bauchi. These figures were obtained from the respective institutions as at 2018.

3.4 Sample Size

This is an important feature of any empirical study to make inferences. It deals with the determination of the number of samples from the entire population. Towards achieving this, Krejcie and Morgan's (1970) table of sample size determination was used to determine the sample. Based on the table, a sample size of 123 was determined. The Krejcie and Morgan table is provided in Appendix.

3.5 Sampling Technique

This study employed convenient non-probabilistic sampling. Convenience sampling involving selecting sample based on convenience because the respondents are easily and readily available. The technique is mostly considered because it is an easy and cheap option which provide reliable response (Ackoff, 1953). Hence, it is preferred for this study because it's easy to distribute to respondents during their site meetings when they come together weekly or monthly.

3.6 Study Area

The choice of the Bauchi state comes as a result of the numerous ongoing construction works engaged by TETFund. The state has the highest number of higher institutions enjoying TETFund interventions than any other state in the region (Ibrahim, 2017). Therefore, is considered with the highest number of essential physical infrastructure (ongoing projects) engaged by TETFund. The study was specifically carried out in four (4) tertiary institutions in Bauchi State (Abubakar Tafawa Balewa University Bauchi, Bauchi State University (Bauchi Campus), Abubakar Tatari Ali Polytechnic Bauchi and Federal Polytechnic Bauchi). Tertiary institutions are chosen because the majority of sources of funds for their projects come from the same source (TETFund) and the kind of building structures constructed are similar and this help put them on the same platform for discussion.

3.7 Data Collection

This refers to the ways through which research data are collected. There are two major sources of data collection: primary source and secondary source. For this research, data were collected through primary sources directly from the respondents using a questionnaire instrument. The questionnaire is structured into 3 section. Section A collects information on the respondents' demography, Section B collects information on the project team effectiveness factor, and section C collects information on the project performance. The

questionnaire was developed using the item adopted from the literature as provided in table 2. A five-point Likert scale was used to obtain the responses to the questionnaire using the level of agreement of the respondents. Before developing the team effectiveness survey, it is necessary to identify what should be measured. A list of team effectiveness factors was gathered. The operationalization of the questionnaire items is presented in Table 2.

Table 2 Operationalisation of research variables

Construct	Definition	Variables	References
Team goals & objectives	Team members' commitment, understanding, agreement and the clarity around direction and priorities, aligning of the entire team around common goals and objectives	- Understanding team's goals and objectives - Agreement of team members to the team goals & objectives - Team commitment to achieving team's goals & objectives - Level of team's achievements of outlined goals & objectives	Assaf et al. (2013); Azmy (2012); Khoshtale and Adeli (2016)
Team leadership	Although the team has a formal leader, leadership functions shift from time-to-time, depending upon the circumstances, the needs of the group, and the skills of the members. The formal leader models the appropriate behavior and helps establish positive norms, comfortability, decision making and good judgements	- Comfortability with the concept of shared leadership. - Comfortable with the decision-making process within the team. - Spending time with team members to clarify team's expectations. - Team exercise good judgment during decision-making process. - Helping other team members in performing difficulties tasks.	Assaf et al. (2013); Azmy (2012); Gaikwad (2016); Khoshtale and Adeli (2016); Oke and Ukaeke (2013); Ullah et al. (2017)
Team roles & responsibilities	There are clear expectations about the roles played by each team member. When action is taken, clear assignments are made, accepted and carried out. Work is fairly distributed among team members. Clear individual roles and responsibilities as well as agreement	- Team member's willingness to help with unforeseen problems that need immediate attention. - Clear individual roles in relations to the team as a whole. - Team members understanding of responsibilities assigned to them. - Agreement with assigned roles & responsibilities.	Assaf et al. (2013); Azmy (2012); Gaikwad (2016); Khoshtale and Adeli (2016); Oke and Ukaeke (2013)
Team relationships	The team spends time developing key outside relationships, mobilizing resources, and building credibility with important players. Conflict management, welfare and care for one another	- Effective conflict management is exercised within the team. - Level of care about the welfare of my teammates. - Teammates' care about each other. - Good decisions made within the team regarding project matters. - Decisions made with the involvement of all team members.	Assaf et al. (2013); Azmy (2012); Gaikwad (2016); Khoshtale and Adeli (2016); Oke and Ukaeke (2013)
Team trust & values	Team members feel free to express their opinions on the tasks as well as on the group's operation, coupled with a high level of trust, respect and value for one another and as a group.	- Treatment of other team members with respect. - Team members trust for one another. - Recognition of contributions to the team members. - Team members believes of trust as an important component in team	Assaf et al. (2013); Azmy (2012); Gaikwad (2016); Khoshtale and Adeli (2016); Oke and Ukaeke (2013)
Team communication	Team members feel free to express their opinions on the tasks as well as on the group's operation, coupled with a high level of Facilitation, participation, agreement, achievement as well as timely and effective communication within and outside of meetings.	- Participation of team members in team meetings. - Facilitation of team meeting - Achievement of clear outcome from team meetings. - Level of agreement during team meetings. - Effectiveness of communication outside team meetings.	Assaf et al. (2013); Azmy (2012); Khoshtale and Adeli (2016); Ullah et al. (2017)

3.8 Pilot Study

Before the main survey, a pilot study was conducted. The developed instrument was first validated by experts. A sample of 35 construction professionals who serve as team members were selected from the population of the research for the pilot test. Out of the 35 questionnaire instrument administered to them, 26 representing 74.3% were retrieved. 25 of the collected questionnaire were considered dully filled and valid for analysis indicating a 71.4% response rate. Six factors were chosen based on the result of the pilot study. The final study questionnaire is design based on the retained factors. The project performance items were also derived from the literature and is structured according to time performance and cost performance. Accordingly, the reliability of the research constructs in the pilot survey was evaluated using Cronbach's alpha as presented in Table 3.

Table 3 Pilot reliability analysis results

Variables	Number of Items	Cronbach's alpha	Reliability Grade
Goals & objectives	5	0.750	Highly Reliable
Leadership	5	0.629	Moderately reliable
Roles & responsibilities	6	0.621	Moderately reliable
Relationship	6	0.726	Moderately reliable
Trust and values	7	0.629	Moderately reliable
Communication	6	0.758	Highly reliable
Creativity and Innovation	6	0.264	Very poor reliability
Team/task processes	5	0.233	Very poor reliability
Top management support	5	0.123	Very poor reliability
Audit and monitoring	6	0.212	Very poor reliability
Cost performance	12	0.750	Highly reliable
Time performance	12	0.670	Moderately reliable

From Table 3, all the four team effectiveness factors with very poor reliability were removed from the study questionnaire as they failed the reliability test.

3.9 Data Analysis

Descriptive and inferential statistics were used for analysing the data received. Descriptive statistics were used to analyse the demographic data and level of the factors using mean ranking, frequency, and percentage**.** Inferentially, multiple regression analysis was used.

The descriptive analysis using mean ranking is using the formula specified in equation 1.

$$Mean\ Ranking = \sum_{i=1}^{5} \frac{a\ x\ n}{5N} \quad \text{eq.1}$$

Where;
a = weight assigned for the scale
n = frequency for response
N = Total number of participants

The inferential statistic using multiple regression is estimated using equation 2.

$$Project\ Performance = Constants + \beta_1 X1 + \beta_1 X2 + \beta_1 3 + \beta_1 X4 + \beta_1 X5 + \beta_1 X6 + \varepsilon \quad \text{eq. 2}$$

Where;
β = Regression weights
X1, …, X6 = The independent variables
ε = The error term

The level of team effectiveness factors and project performance are evaluated using mean score decision rule adopted from Abdullahi (2017), Hassanain and Iftikhar (2015), and Kasim et al. (2013). The deduced decision is shown in Table 4.

Table 4 Response evaluation criteria

S	Level	Mean Interval
1	Very Low (VL)	1.00-1.80
2	Low (L)	1.81-2.60
3	Average (M)	2.61-3.40
4	High (H)	3.41-4.20
5	Very High (VH)	4.21-5.00

Based on the above evaluation criteria, the research constructs are evaluated descriptively using tables and mean ranking.

4.0 DATA ANALYSIS AND RESULT

Before analysing the data collected for this research, wrong posting and missing value check, questionnaire response rate analysis, as well as reliability test, were conducted. According to Pallant (2011), it is of great importance for a researcher to ensure that the data collected are free from errors before subjecting to analysis. All values assigned for a scale were carefully checked and all wrongly posted values were corrected. The response rate for the administered questionnaire is presented in Table 5.

Table 5 Response rate

Questionnaire	Frequency	Percentage
Distributed	150	100%
Returned	139	93%
Usable/Valid	134	89%

Table 5 shows that the response rate for the study was 89 per cent. This response rate is considered adequate for this research based on the argument of Sekaran (2003) that a response rate of 30 per cent is acceptable for surveys. Next, the internal consistency of the questionnaire instrument was tested using Cronbach's alpha coefficient. According to Hinton et al. (2014), the alpha score above 0.75 is generally regarded as highly reliable, from 0.50 to 0.75 is generally accepted as moderately reliable, while a score that is less than 0.50 is generally taken as a scale of low reliability. The reliability of the research variables is presented in Table 6.

Table 6 Reliability test of constructs

Constructs	No. of Items	Cronbach's alpha	Level
Goal & Objectives	5	0.85	Highly reliable
Leadership	5	0.76	Highly reliable
Roles and Responsibilities	6	0.80	Highly reliable
Relationship	6	0.76	Highly reliable
Trust and Values	7	0.76	Highly reliable
Communication	6	0.80	Highly reliable
Cost Performance	12	0.80	Highly reliable
Time Performance	12	0.88	Highly reliable

From Table 6, all the measured research constructs attained the level of high reliability with Cronbach's alpha score of more than 0.70.

4.1 Respondents' Demography

The descriptive statistics of the respondents' information are presented in Table 7.

Table 7 Respondents' profile

S/N	Respondents' Details	Response	Frequency	Percent
1	Gender	Male	119	88.8
		Female	15	11.2
2	Team	Clients' team	25	18.7
		Consultants' team	43	32.1
		Contractors' team	66	49.3
		2 - 4 People	15	11.2

		5 - 6 People	63	47.0
		7 - 10 People	34	25.4
		More than 10 People	22	16.4
3	Educational Background	HND	25	18.7
		Degree	27	20.1
		PGD	32	23.9
		Masters	50	37.3
4	Profession	Architecture	30	22.4
		Building	20	14.9
		Quantity Surveying	36	26.9
		Engineering	48	35.8
5	Years of Experience	Less than 5 years	4	3.0
		5 - 10 years	14	10.4
		11 - 15 years	34	25.4
		15 years and above	82	61.2
6	Project undertaken in the last 5 years	1 - 10	26	19.4
		11 - 20	101	75.4
		Above 20	7	5.2
7	Statutory Professional Body	ARCOM	30	22.4
		CORBON	20	14.9
		QSRBN	36	26.9
		COREN	48	35.8

From Table 7, the result indicated that the majority of the respondents were contractors followed by the consultants who were mostly males in moderately sized firms with about 6-10 members. Most of the respondents have a degree with vast years of experience in the construction industry.

4.2 Level of the Effectiveness of Construction Project Team in the Study Area

The level of effectiveness of the construction project team in the study area was evaluated using mean ranking as presented in Table 8 below.

Table 8 Team Effectiveness Factors (TEF)'s ranking

Team Effectiveness Factors	Mean	Standard Deviation	Rank	Remark
Roles & responsibilities	2.40	0.386	1	Low
Leadership	2.36	0.364	2	Low
Trust and values	2.36	0.323	3	Low
Relationship	2.33	0.307	4	Low
Communication	2.30	0.365	5	Low
Goals & objectives	2.18	0.464	6	Low
Aggregate	**2.32**	**0.368**		**Low**

The result in Table 8 shows that the mean values for the team effectiveness factors range from 2.18 to 2.40 indicating a low level of project team effectiveness with team goals and objectives having the least effectiveness. On average, the project team effectiveness is low as indicated by a mean value of 2.32.

4.3 Level of Project Performance in the Study Area

Table 9 Level of project performance

Performance	Mean	Standard Deviation	Remark
Cost Performance	1.92	0.134	Low
Time Performance	1.90	0.155	Low
Project Performance (Cost and Time)	**1.91**	**0.144**	**Low**

The result in Table 9 shows the level of project performance in the study area is low. This is indicated by a mean value of 1.92 for cost performance and 1.90 for time performance with an average mean of 1.91 indicating poor project performance in the Nigerian higher education institutions' construction projects.

4.4 Effect of Team Effectiveness on Project Performance

Multiple Regression Analysis (MRA) was conducted to determine the influence of project team effectiveness on project performance of public building projects in North-Eastern Nigeria. Before interpreting the models, it is important to check for some assumptions for the output of multiple regression as recommended by Pallant (2011). The first assumption was the multicollinearity of the variables involved in the analysis, this is to ensure at least reasonable correlation between independent variables. The result indicated that the independent variables are reasonably related, the relationship between them was not too high, the highest correlation was 0.473 which is lower than 0.7 (Pallant, 2011). To support this, the values displayed by Tolerance and VIF also were substantial as well, with all the independent variables having 0.464 and 2.153 respectively. The tolerance levels range from 0.410 to 0.524 all above the recommended 0.1 minimum. Similarly, the VIFs range from 1.907 to 2.440 all below the recommended minimum of 10. Therefore, the study's variables pass the collinearity test and are suitable for multivariate analysis as suggested by Pallant (2011).

This research checked the normality of the data distribution using skewness and kurtosis. Kothari and Garg (2014) recommended that skewness and kurtosis values of -3 to +3 are considered asymmetrical distribution which is suitable for parametric tests and presume a normal distribution. The result shows that all the variables are within the recommended range of -3 and +3 (Kothari & Garg, 2014). This indicated that there was an agreement between the opinions of the respondents which reduced the occurrence of outliers.

The project performance is measured by aggregating the project cost performance and project time performance. The regression model was specified to produce the model summary, the analysis of variance (ANOVA) and the coefficient to determine the influences of the independent variable on each of the individual dependent variables as presented in Table 10.

Table 10 Model summary and ANOVA for projects performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
2	.777	.604	.585	.287	32.302	.000

Table 10 demonstrates the aggregated regression model summary and ANOVA result. The model produced an overall R-value of 0.777 and R square value of 0.604 with F-statistics of 32.302 which are significant as indicated by a p-value of 0.000 far below the recommended maximum of 0.05 (Pallant, 2011). This shows that the model predicts about 60.4 per cent of the variation in projects performance. In other words, about 60.4 per cent of the changes in project performance whether high or low can be explained by changes in the construction project team effectiveness. The model is fitted well and good as it produced strong R square and F statistics values.

The individual influence of team effectiveness factors on aggregated cost and time performance (project performance) is presented by the standardized regression coefficients in Table 11.

Table 11 Regression coefficients for project performance

	Unstandardized coefficient		Standardized coefficient	t	Sig.
	B	Std Error	Beta		
Constant	-.014	.156		-.047	.663
Goals & Objectives	.056	.036	.062	.807	.176
Leadership	.088	.048	.076	.955	.123
Roles & Responsibility	.185	.046	.170	2.363	.003
Relationship	.125	.056	.092	1.161	.067
Trust & Values	.014	.057	.010	.126	.601
Communication	.304	.039	.265	3.065	.000

Table 11 depicts the individual influence of the independent variables on the dependent variable. The result shows that the team effectiveness factors with significant influence on project performance are communication and roles & responsibility as indicated by t-statistics values of 3.065 and 2.363 with p-values of 0.000 and 0.003 which are far below the recommended maximum of 0.05 (Pallant, 2011). Communication is the team effectiveness factor with the highest influence on project performance as indicated by a standardized beta coefficient of 0.265.

5.0 DISCUSSION

5.1 Level of Project Team Effectiveness

The first objective of this study was to assess the level of team effectiveness in the study area. The result shows that the current level of construction project team effectiveness in the northeastern Nigerian construction project team is low (least effective) towards projects performance with a 2.32 mean value. This finding conforms to that of Oke and Ukaeke (2013) in Nigeria, Gaikwad (2016) in India, Khoshtale and Adeli (2016) in Iran and Assaf et al. (2014) in Saudi Arabia. These counties have one thing in common – developing nations. Contrary to this result, a study by Azmy (2012) in the United States found most of the team effectiveness factors to be moderate (average). However, all of the above-mentioned studies did not set a benchmark for assessing the overall team level of effectiveness. They conclude their studies by just assessing team effectiveness factors without classifying the degree of levels as to whether; very high (highly effective); high (effective); average (fairly effective); low (least effective); very low (not effective) besides Azmy (2012) in the US. This study used a benchmark in which team effectiveness was found to be low (least effective).

5.2 Level of Project Performance

The second objective of this study was to assess the level of project performance in the study area. Analysis of responses from respondents found the level of projects performance of public building projects is low with a mean value of 1.91 (Abdullahi, 2017; Hassanain & Iftikhar, 2015; Kasim et al., 2013). This finding is in line with Auma (2014), Lepartobiko (2012), Memon et al. (2012), Ogunde et al. (2017), and Okweto (2012) who found that projects performance is poor, especially in developing countries. However, none of the above studies established the level of projects performance as to whether very high, high, average, low or very low. This study used a benchmark in which project performance was found to be low. This is to say that poor project performance could result in loss of profit by the project's clients as well as drastically reducing contribution to the national gross domestic product by the Nigerian construction industry.

5.3 Influence of Project Team Effectiveness on Project Performance

The main aim of this study was to determine the influence of construction projects team effectiveness on public building project performance in North-Eastern Nigeria higher educational institutions. The results revealed an adjusted R square value of 0.585. This shows that the model predicts about 58.5 per cent of the variation in projects performance. In other words, about 58.5 per cent of the changes in project performance whether high or low can be explained by changes in the construction project team effectiveness. Significant value from ANOVA was found to be $P = 0.000$ ($P < 0.05$). This finding resonates the research outcome of Khoshtale and Adeli (2016), Assaf et al. (2014) and Azmy (2012) who found team effectiveness factors with positive, high correlation and strong effect on project performance. On the individual influence of the independent variables on the dependent variable. The result shows that the team effectiveness factors with significant influence on project performance are communication and roles & responsibility as indicated by t-statistics values of 3.065 and 2.363 with p-values of 0.000 and 0.003 respectively. Communication is the team effectiveness factor with the highest influence on project performance as indicated by a standardized beta coefficient of 0.265. This direct relationship shows that improvement in team effectiveness factors significantly improves project performance. The result indicated that any 1 unit change in team effectiveness factors causes project performance to change by 0.265 units as indicated by the standardized beta coefficient. This is followed by roles and responsibilities with t-statistics values of 2.363, p-values of 0.003 and beta value of 0.170. The result also indicated that any 1unit change in team effectiveness factors causes project performance to change by 0.170 units as indicated by the standardized beta coefficient. The other team effectiveness factors do not have a significant influence on the project performance. 'Trust and value' is the team effectiveness factor with the least influence on project performance. This shows that team effectiveness factors with significant influence on projects performance was found to be communication and roles & responsibility. Closely related to this discovery is the findings of Khoshtale and Adeli (2016); Assaf et al. (2014) and Azmy (2012).

6.0 CONCLUSION

Construction is normally evaluated based on three performance evaluation criteria. These criteria are cost, time and quality. Although all these criteria are indispensable in construction, the first two are the fundamental criteria for the success of any project and their product is called 'project performance'. In Nigeria, specifically, the construction industry has long been associated with poor performance in terms of cost and time (project performance). Despite this, efforts were limited in determining the issue relating to team effectiveness and projects performance by construction projects teams. Accordingly, this research evaluated the performance of construction projects in northeastern Nigeria as well as the team effectiveness factors that hinder the performance of construction projects in northeastern Nigeria higher educational `institutions. The research found, in order of their presence, roles and responsibilities, leadership, trust and values, team relationship and communication and goals and objectives low level of effectiveness. The general performance level of construction projects in the study area was found to be low. Finally, the research found that construction project team effectiveness has a significant influence on project performance. Accordingly, projects performance can therefore be improved by improving the team effectiveness factors especially communication, and role and responsibilities factors.

This research contributed to knowledge by filling the vacuum of knowledge of projects team effectiveness on projects performance in northeastern Nigeria. The research revealed the level of team effectiveness, the level of projects performance and the effects of the former

duos on the latter. These findings have practical implications to policymakers, contractors, clients, construction industry professional bodies and all projects team leaders.

6.1 Recommendations

The research recommended the improvement of the team effectiveness factors by the construction projects teams. Specifically, the team effectiveness factors with the least presence in the construction projects teams should be given much attention. These are team communication and team goals and objectives. Similarly, projects performance can be improved by improving the team effectiveness factors. Thus this research is recommending the improvement of team effectiveness factors to achieve projects performance. To improve project performance, the most influential team effectiveness factor on projects performance, communication and roles & responsibility, should be given more emphasis in improvement.

On the other hand, the professional bodies in the construction industry should endeavour to be organizing team effectiveness symposiums and colloquiums to share knowledge and advances in working collaboratively as a team. Professional bodies in the construction industry should also ensure that their members imbibe collaborative working culture in their construction teams. The government and all its agencies concerned with construction activities should ensure the enforcement of team working in all construction projects. Clients, contractors and consultants should also be team conscious and demand nothing less than collaborative working from their respective teams. All stakeholders in construction projects should give priority to team effectiveness in construction projects. Further research can be conducted to explore additional factors that influence projects performance. The research also used the first-generation multivariate analysis technique of Multiple Regression Analysis (MRA) to analyse the data by transforming the variables into single measure constructs. Another study should replicate the research using second-generation multivariate analysis techniques such as the variance-based Partial Least Square-Structural Equation Modelling (PLS-SEM) and covariance-based Structural Equation Modelling (SEM).

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APPENDIX
Sample Size Determination Table
(Source: Krejcie & Morgan, 1970)

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	310
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	**123**	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384