

PUBLIC PROCUREMENT REGULATIONS AND SUSTAINABLE ADMINISTRATION OF CONSTRUCTION CONTRACTS IN NIGERIA TERTIARY EDUCATION SECTOR

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ABSTRACT

Purpose: The aim of this research is to assess the level of compliance of public procurement regulations and level of application of contract administration practices in project delivery with a view to enhance performance of tertiary institution projects.

Design/methodology/approach: Survey design was adopted where data were obtained from 635 valid structured questionnaire. The methods of data analysis were simple percentage, mean score, Kruskal – Wallis test and Bonferroni- Dunn test.

Findings: The results revealed that there is high level of compliance with public procurement regulations among tertiary institution in Nigeria, however there is moderate level of application of sustainable contract administration practices. There is significant difference in the level of compliance with public procurement regulations based on institutions' characteristics. However, the study indicated that there is no significant difference in the opinion of institutions on level of application of sustainable contract administration practices in construction project execution in the tertiary education sector in Nigeria.

Research limitations/Implications: The study revealed that there is high level of continuous improvement and learning as well as promotion of collaboration among the professionals and other stakeholders in project delivery. Furthermore, waste reduction strategies were highly applied during construction, and promotion of diversity in construction was encouraged. Ethical responsibilities were highly supported and encouraged.

Practical implications: Tertiary institutions in Nigeria should improve on the level of application of sustainable contract administration practices by improving top management support, corporate governance, professionalism in public procurement, effective stakeholder participation, and organizational culture.

Originality/value: Models for predicting the strength of concrete block walls developed on the basis on these findings would contribute to accurate assessment of structures incorporating low strength concrete block walls.

Keywords: Public procurement, Regulations, Sustainable contracts, Construction, Tertiary education.

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1. INTRODUCTION

Adedokun *et al.* (2022) observed that there is growing evidence of cost and time overruns in public tertiary education projects in Nigeria. The implementation of Public Procurement Regulation (PPR) in Nigeria and most developing countries is affecting cost performance of construction projects (Zadawa *et al.*, 2017). Bamidele *et al.* (2019) found that the projects initiated in public tertiary institutions using the PPR are bedeviled by time overrun. The rate of project abandonment in the tertiary education sector (TES) is also significant (Aghimien and Aigbavboa, 2018). Alao and Jagboro (2017) maintained that the project abandonment in Nigeria is on the increase with over \$47.9billion needed for completion.

Furthermore, a significant proportion of tertiary education sector (TES) projects suffered cost and time overruns, which resulted in change of project specifications to meet approved budget (Mangvwat *et al.*, 2020). Tertiary Education Sector Projects continue to record abysmal delay despite benefiting from a significant level of funding through the TETFUND (Ogbeifun and Pretorious, 2022). Contributing to the debate on the abysmal performance of TES building projects, Adedokun and Egbelakin (2022) characterised the capital outlay in this sector as huge yet failed to meet performance objectives in cost, time and quality.

Moreso, Obieye (2019) posited that projects initiated using the Nigerian PPR failed to provide value for money. The growing inefficiency in the administration and the management of public procurement practices in TES have resulted in the loss of millions of Naira annually (Ezinwa *et al.*, 2020). Current PPR seems less effective in payment delivery as the bulk of performance problems in TES are linked with delayed payment (Alao and Jagboro, 2017; Adedokun *et al.*, 2021; Ogbeifun and Pretorious, 2022). Projects in this sector are characterised by growing cases of cost and time overruns (Shwarka, 2019; Bamidele, 2020a; 2020b; Adedokun *et al.*, 2022). Aghimien and Aigbavboa (2018) also found that most projects initiated in the TES of Nigeria are temporarily and permanently abandoned, completed above budget, behind schedules and below standard quality with adverse implications on the quality of tertiary education (Aghimien and Aigbavboa, 2018; Bamidele, 2020a; Adedokun *et al.*, 2021). Based on this development, mechanisms must be developed to support effective project performance in TES delivered under the current public procurement regulations.

Public procurement refers to the acquisition of the goods and services requisite to proper function of governance activities and life in the society (Thai, 2001; Quinot and Arrowsmith, 2013). However, contextually, within the construction industry the understanding of procurement is beyond the goods and services, but focuses on strategic issues dealing with organization, processes, people and overall tactical undertaking, which aids clear delineation of roles, responsibilities and risks in the project's lifecycle (Love *et al.*, 1998). Promoting good governance is a global quest and effective public procurement is imperative to efficient public service governance. Good governance is manifested through efficient and effective management of public transactions in manner that guarantees value for money. In the public sector, Public Procurement Regulation (PPR) has remained one of the important tools with global acceptability implemented across the world to achieve sustainable construction objective (Bamidele, 2020a).

Sustainable construction contracts are becoming increasingly important in the construction industry, as more and more companies strive to reduce their environmental impact and meet sustainability goals. Sustainable construction can be defined as the process of designing, constructing, operating, maintaining, and demolishing buildings and infrastructure in an environmentally responsible and resource-efficient manner, while also considering social and economic factors (Kibert, 2016). Sustainable contract administration in construction refers to the integration of sustainability principles into the procurement and management of construction contracts. This approach aims to promote environmental, social, and economic sustainability throughout the construction process, from the design stage to the end of the contract (Tetteh *et al.*, 2019). Sustainable contract administration theory emphasizes the importance of collaborative relationships between the parties

involved in the construction project, including the contractor, client, and other stakeholders (Oyedele *et al.*, 2018), whether in the private, public, or other sectors of the economy including the construction sector.

The tertiary education sector is an important component of public sector receiving a significant proportion of the total public sector procurement globally (Adedokun *et al.*, 2022). Aghimien and Aigbavboa (2018) asserted that development of nations is predicated on the quality of their education. Tertiary Education Sector (TES) is deemed strategic and the apex of the educational systems; and construction work is core to the performance of tertiary institutions (Saeed and Kayani, 2019; Shehu and Shehu, 2022). The character and scope of infrastructure or physical facilities underpinning the performance of the tertiary education sector include residential, educational, institutional, assembly, business, mercantile, industrial and storage and access facilities such as roads, drainages and services (Adedokun *et al.*, 2022). These projects are initiated and completed in this sector to enhance teaching research and development (Rahman *et al.*, 2019).

The objectives for the adoption of the PPR were defined as the improving value of money, promoting transparency, accountability, competitiveness and elimination of corruption (PPA, 2007). Shwarka (2019) validated the roles of PPR as harmonization of government practices and development of pricing standards. Thus far, several studies have demonstrated these benefits in practical terms including value for money in government procurement. Yahaya *et al.* (2019) declared that despite the challenges inhibiting the performance of PPR in practice, the state of PPR and project performance are better compared with what it was prior the PPR era. Beyond these benefits, studies also call for the need to extend inherent regulations beyond promoting efficiency of public contracting system to ensuring outputs of these processes satisfy national developmental needs (Shwarka, 2019), improves budgeting and appropriation monitoring system to provide audit trail post-contract for continuous improvement (Yahaya *et al.*, 2020).

Despite the global importance of public procurement regulations and contract administration practices, the level of compliance with the public procurement regulations and application of sustainable contract administration practices in the tertiary education sector construction project delivery are less seen and have not been significantly established in Nigeria. In response to general call for continuous improvement in the overall performance of construction projects and sustainable contract administration in the tertiary education sector in Nigeria, this study assessed the level compliance with public procurement regulations in the tertiary education sector construction project delivery, and evaluated the level of application of sustainable contract administration practices in construction project execution in the tertiary education sector in Nigeria with a view to achieve effective and sustainable contract administration in the tertiary education sector in Nigeria. In order to achieve this aim, the following objectives were set for the study:

- i. Evaluate the level of compliance with public procurement regulations in the tertiary education sector construction project delivery in Nigeria.
- ii. Assess the level of application of sustainable contract administration practices in construction project execution in the tertiary education sector in Nigeria.

The following hypotheses were postulated in the study:

Ho₁: There is no significant difference in the level of compliance of public procurement regulations among tertiary institutions in Nigeria.

Ho₂: There is no significant difference in the opinion of Tertiary Institutions on level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in Nigeria.

2. LITERATURE REVIEW

Procurement has emerged as a veritable tool for mainstreaming sustainability into the public sector. As a result, various tools are evolving to benchmark public procurement as sustainable including the ISO 20400 (Claren, 2017). In Nigeria, Yahaya *et al.* (2019)

asserted there is an inclination towards sustainable development provisions in the public procurement regulation through integrated social and industrial policies of the government in the public procurement projects. However, the narrations of these social, industrial and other dimensions of the sustainable development such as environmental and economic issues in public procurement are less visible in the literature space. Contract administration has evolved as systems of diverse understanding covering pre-contract issues such as information seeking, bid preparation and document validations (Yahaya *et al.*, 2020) to post-contract monitoring and implementation processes (Gundus *et al.*, 2020a; 2020b). Contract administration affects project outcomes and embraces the diverse challenges that emanates during contract implementation (Uyinmwun and Ogbu, 2018). Gunduz. and Elsherbeny (2020) highlighted the importance of contract administration and the consequences of the poor administration in construction projects and stressed the exigency to investigate application of sustainable contract administration practices.

Overall, broad ranging contextual issues associated with public procurement regulation and sustainable contract administration generally and in the inclusive context of TES have been examined including the role of reforms in planning practices (Shwarka, 2019). However, the aspects of the role of PPR in promoting sustainable administration of construction contract remains very sketchy. With persistent overload on technical and financial requirements (PPA, 2007), aspect of sustainability and sustainable development within the Nigeria Public Procurement Administration remains uncertain. This study believes that existing PPR can be improved to account for sustainability issues and effective contract administration by developing pertinent knowledge on how these objectives can be achieved. Existing studies also tend to localized and regionalized their findings thereby providing conflicting outcomes. Focal studies examining these issues across various regions, the Federal Capital Territory, Abuja and Lagos are very few. Victor (2012) also asserted that the total expenditure in public procurement could lessen through the implementation of regulated procurement practices. The idea of regulation is essentially geared towards the sustainability of the processes, sustainable development and the efficiency of the procured goods and services (Para, 2021). Through the implementation of regulated procurement practices also, organizations are positioned to tackle the difficulties encountered in public procurement globally (Ilyas *et al.*, 2018).

In Nigeria, over 70% of these infrastructures are funded through public sector finance notably, through intervention agencies such as the TETFUND, Central Bank and the defunct Petroleum Development Trust Funds (Abdullahi *et al.*, 2019; Muhktar *et al.*, 2021 and other international agencies (Bamidele, 2020b). Aghimien and Aigbavboa (2018) argued that sources of funding of TES projects in Nigeria are agents of necessity including TETFUND, NEEDS and Internally Generated Revenue. Irrespective of the sources of funding infrastructure in TES, the quantity and the quality of these facilities must support its objectives.

Adetoro *et al.* (2015) assessed compliance with procurement regulations in Nigeria's federal universities. The study found that while there was some level of compliance, there were also several instances of non-compliance, including non-transparent tender processes, lack of proper documentation, and contract splitting. Public institutions indulged in contract splitting to avoid open competitive bidding and avoid seeking approval of the TETFUND and tender board at the Federal Capital Territory (Adetoro *et al.*, 2015).

Using data obtained from procurement officers in Southwest, Nigeria, Bamidele (2020a) revealed that the level of compliance is low and does not vary significantly between the three tiers of tertiary education institutions, namely Colleges of Education, Polytechnics and the Universities. Although Nigeria has enacted several procurement laws and regulations such as the Public Procurement Act 2007, the due process policy, and the Bureau of Public Procurement (BPP) guidelines, compliance with these laws and regulations is often weak, and enforcement is inadequate.

Njagi *et al.* (2020) investigated public participation in contract administration for sustainable procurement management in devolved system of governments in Kenya and noted that the community is involved in contract administration to a great extent through supplier identification, project negotiations, actual supplying of local available materials

and ensuring compliance to contractual terms and conditions by the contractors. The study concluded that an improvement in contract administration in public based projects leads to a positive improvement in sustainable procurement management in Kenya.

Mugabe *et al* (2019) assessed the influence of Contract Administration on the implementation of Construction Projects in Rwanda. The population of the study comprised real estate developers, contractors and consultants. The study posited that contract administration plays a major role towards project implementation and subsequently the overall success. The study indicated that stakeholders should bear in mind that construction contracts may not always be successfully implemented, as several factors will mitigate the effective and efficient implementation of construction project.

Oppong (2019) assessed the effect of contract administration on project completion and attainment of project objectives in basic school construction in greater Accra region by free senior high school secretariat of the ministry of education in Ghana through adoption of total quality management. The study revealed a positive significant relationship between total quality management (TQM) and Procurement. In addition, there was a direct relationship between total quality management (TQM) and successful completion of the undertaken projects. This connotes that when procurement practices are done through effective application of total quality management (TQM) methods, contract administration will be effective thereby leading to successful completion of the projects. That is, when corporate culture quality, strategic quality management, quality improvement measurement systems, people and customer management, are satisfactory. Others include operational quality planning, external interface management, supplier partnerships, teamwork structures, customer satisfaction orientation, and communication of improvement information. Effective contract administration implies that the right materials are procured at the right place, right time, at the right price with the right quality and quantity thereby leading to successful completion of the project.

3. METHODOLOGY

This study addressed public procurement regulation and sustainable contract administration in TES Projects (TESP) in Nigeria. This study focused on public tertiary education institutions in Nigeria. The following geopolitical Zones were chosen for the study namely South-west, North-West, North-Central, South-South, South-East and North-East. A survey design was adopted in the study, and random sampling techniques was used to obtain the sample for this study. One thousand and twenty-eight (1028) copies of questionnaire were randomly distributed by the researchers and research assistants among construction professionals, procurement officers, consultants, and contractors, Low-operational/field staff, Middle level-policy implementers, and top management level (formulation of policy) in the Tertiary institutions in Nigeria. The criteria for selection of the professionals were years of experience, educational qualification, and professional development. The questionnaire has three sections. The first section comprises information about the respondents. The second section comprises variables used to assess the level of compliance with public procurement regulations in the tertiary education sector construction project delivery in Nigeria, and the level of application of sustainable contract administration practices in the tertiary education sector construction project delivery in Nigeria. The data used in the study were collected using a five-point scale of 1 to 5 (Anyanwu, 2018). Scale 1 represents a very low level of compliance/ application, while scale 5 represents a very high level of compliance of public procurement regulations/ sustainable contract administration practices. Methods of data analysis include simple percentage, mean score, Kruskal – Wallis test, and Bonferron- Dunn test. The simple percentage was used to analyze the respondents' characteristics; the mean score was used to assess the level of compliance of public procurement regulations/ sustainable contract administration practices. Kruskal – Wallis test was used to test the hypotheses, while Bonferron- Dunn test was used to carry out posthoc test so as to determine the source of variation. Using a 5-point scale, the decision rule in this study is that any public procurement regulation/ sustainable contract administration practice with an overall mean score of 1.0-1.49, 1.5-2.49, 2.5-3.49, 3.5-4.49, and 4.5-5.0 is considered to have a very low

level of compliance/ application; low level of compliance/ application, moderate level of compliance/ application, high level of compliance/ application; and very high level of compliance/ application respectively (Ogenma 2018).

4. PRESENTATION AND DISCUSSION OF RESULTS

4.1. Questionnaire Distribution and Response in the Study

The research instrument used in this study was structured questionnaire. The questionnaire was administered among the Tertiary Institutions in Nigeria. The results of analysis of questionnaire distribution and response in the study were presented in Table 1.

Table 1 showed that the number of questionnaires administered to Tertiary Institutions in Nigeria were 164, 215, 128, 159, 202, and 160 in South-South, South-West, North Central, North-East, North-West, and South-East, respectively. The response rate ranges between 18.3% and 90%. North-Central received the highest response rate of 90% while North-West got the least response rate of 18.3%. In all, an overall response rate of 62% was achieved. According to Ijosiga and Odubuker (2016), a response rate above fifty percent (50%) is considered good and adequate.

Table 1: Questionnaire Distribution and Response Rate

Geopolitical Zones	Number of questionnaires administered	Number of questionnaires returned	Percentage of questionnaire returned (%)
South-South	164	96	59
South-West	215	141	66
North-Central	128	115	90
North-East	159	136	86
North-West	202	37	18.3
South-East	160	110	68
Total	1028	635	62

Researcher's Field Data (2024)

4.2. Results of Reliability Test on Tertiary Institutions' Responses

Table 2 showed that all the Cronbach coefficient values were above the 0.7 threshold which indicated that the data collected from the tertiary Institution were highly reliable and suggested good inner consistency.

Table 2: Results of Reliability Test on Tertiary Institutions' Responses

Political Zones In Nigeria	Number of Items	Cronbach's Alpha Tertiary Institutions' Responses
South-South	128	0.835
South-West	128	0.856
North-Central	128	0.867
North-East	128	0.878
North-West	128	0.887
South-East	128	0.893

4.3. Respondents' Characteristics

Table 3 shows the results of the analysis of respondents' characteristics. It shows that 15.1%, 22.2%, 18.1%, 21.4%, 5.8%, and 17.3% of the respondents were from the South-South, South West, North Central, North East, North West, and South East region of Nigeria respectively. Table 3 also shows that the category of the respondents. These include the construction professionals, procurement officers, consultants, and contractors. These categories of the respondents are responsible for contract administration within the tertiary education sector in Nigeria. The results revealed that 36.7%, 27.6%, 24.3%, and 11.5% of the respondents were construction professionals, procurement officers, consultants, and

contractors respectively. Table 3 shows that 26.3%, 56.9%, and 16.9% were Low-operational/field staff, Middle level-policy implementers, and Top management level (formulation of policy) respectively.

The level of educational qualification of the respondents was also analysed. The result presented in Table 3 also shows that 63.5% of the respondents have First Degree, while 31.3% of the respondents have Postgraduate degree. In addition, 5.2 % of the respondents obtained College level and other relevant qualification. This shows that the respondents that participated in this study are well educated and knowledgeable. Therefore, data obtained from them are valid and reliable. Furthermore, the overall years of experience of the respondents with the organisation was analysed, the result indicated that 0.8%, 35.1%, 43.8%, and 20.3% of the respondents have years of experience with the organizations in the range of 1– 5years, 6 – 10years, 10-20years, and above 20years respectively.

Moreso, the results in Table 3 shows that 0.5%, 28.0%, 50.2%, and 21.3% of the respondents have 1– 5years, 6 – 10years, 10-20years, and above 20years overall years of experience in the industry respectively. It implies that majority of the respondents considered in this study have worked more 10 years with their respective organizations and in the industry. And therefore, have the prerequisite experience for reliable information on the study. The extent of professional development of the respondents was analysed, the results revealed that 77.3% of the respondents are professionally registered with their respective professional bodies while 22.7% of them are yet to be professionally registered. This revealed a high level of professional commitment and development on the part of the respondents which can make them authorities in matters of construction industry.

Table 3: Respondents Characteristics

Respondents Characteristics	Frequency	Percent
Location of organisation		
South- South	96	15.1
South West	141	22.2
North Central	115	18.1
North East	136	21.4
North West	37	5.8
South East	110	17.3
Total	635	100.0
Category of respondents		
Construction professional	233	36.7
Procurement officer	175	27.6
Consultant	154	24.3
Contractor	73	11.5
Total	635	100.0
Level in organization		
Low-operational/field staff	167	26.3
Middle level-policy implementers	361	56.9
Top management level (formulation of policy)	107	16.9
Total	635	100.0
Educational qualification		
First Degree	403	63.5
First degree + Postgraduate degree	199	31.3
College level and others	33	5.2
Total	635	100.0
Overall years of experience with organization		
1– 5	5	.8
6 – 10	223	35.1
10-20years	278	43.8
20years and above	129	20.3
Total	635	100.0

Respondents Characteristics	Frequency	Percent
Overall years of experience in the industry organization		
1– 5	3	.5
6 – 10	178	28.0
10-20years	319	50.2
20years and above	135	21.3
Total	635	100.0
Professional Qualification		
Registered	491	77.3
Not registered	144	22.7
Total	635	100.0

4.4. Level of Compliance of Public Procurement Regulations

The level of compliance with public procurement regulations during project execution among selected Tertiary Institutions was analysed and presented in Table 4. The decision rule is that any public procurement regulation that has mean score ranging between 1 - 1.49, 1.5 - 2.49, 2.5 - 3.49, 3.5 - 4.49, and 4.5 - 5.0 is considered to have very low level of compliance, low level of compliance, moderate level of compliance, high level of compliance, and very high level of compliance respectively. The results indicated that Procurement planning (MS = 4.0838) ranked first, followed by transparency through removal of third-party interest (MS = 4.0334). The third procurement regulation that recorded high level of compliance among the Tertiary Institutions is meetings of institution tender board for ratification of awards (MS = 4.0252). It was also revealed that there was strict adherence to procurement guidelines (MS = 4.0186).

Furthermore, the institutions ensured that there was due diligent study of contractors/consultants financial and technical information (MS = 3.9727) as well as stating eligibility/prequalification criteria in tender (MS = 3.9672) and meeting the minimum tender documents requirements (MS = 3.9658). In addition, there was high level of compliance in respect to participation of relevant stakeholders bid opening (MS = 3.9622), and procuring within stipulated timelines (MS = 3.9517). Other public procurement regulations that recorded high level of compliance include advertisement of tenders (MS = 3.9515), stating bid submission and bid opening information (MS = 3.9489), tender analysis using professionals (MS = 3.9426), right of public to inspect procurement proceedings (MS = 3.9258), establishment of procurement planning committee (MS = 3.9238), and budgetary provision before initiating procurement (MS = 3.9036). The institutions that participated in this study exhibited high level of compliance through preservation of records of procurement proceedings (MS = 3.9031), composition of tender boards (MS = 3.8965), collection of letter or no objection from BPP (MS = 3.8946), exclusion of parties with interests from procurement (MS = 3.8787), obtaining a priori permission for projects above thresholds (MS = 3.8719), verification of performance warranties (MS = 3.8651), submission and consideration of tender report (MS = 3.8590), Feedback to bidders stating reasons for unsuccessful bid (MS = 3.8420), and obtaining performance bond (MS = 3.8318). The group mean scores of 3.6965, 3.9932, 3.8761, 4.1973, 4.2376, and 3.6042 indicated high level of compliance with public procurement regulations among Tertiary Institutions in South - South, South - West, North - Central, North - East, North - West, and South - East respectively. The overall mean score of 3.9341 revealed high level of compliance of public procurement regulations among Tertiary Institutions in Nigeria.

Table4: Level of Compliance of Public Procurement Regulations

Code	VARIABLES	South- South Mean	South West Mean	North Central Mean	North East Mean	North West Mean	South East Mean	Group Mean	Rank	Remark
PPR2	Procurement planning	3.9063	4.1915	4.0870	4.2941	4.4054	3.6182	4.0838	1	HLC
PPR16	Transparency through removal of third-party interest	3.9042	3.9716	3.9652	4.3088	4.4324	3.6182	4.0334	2	HLC
PPR13	Meetings of institution tender board for ratification of awards	3.9271	4.0071	3.7913	4.4118	4.4865	3.5273	4.0252	3	HLC
PPR15	Strict adherence to procurement guidelines	3.8271	4.0142	3.7565	4.3088	4.4595	3.7455	4.0186	4	HLC
PPR6	Due diligent study of contractors/consultants financial and technical information	3.7458	4.0780	3.8783	4.2647	4.3514	3.5182	3.9727	5	HLC
PPR5	Stating eligibility/ prequalification criteria in tender	3.7500	4.0780	3.8783	4.1912	4.3514	3.5545	3.9672	6	HLC
PPR7	Meeting the minimum tender documents requirements	3.8646	3.9362	3.8348	4.0368	4.5135	3.6091	3.9658	7	HLC
PPR9	Participation of relevant stakeholders in bid opening	3.5250	4.0780	3.9826	4.3088	4.3243	3.5545	3.9622	8	HLC
PPR17	Procuring within stipulated timelines	3.7875	3.8865	3.9478	4.1176	4.1892	3.7818	3.9517	9	HLC
PPR4	Advertisement of tenders	3.6667	4.0071	4.0174	4.2647	4.1351	3.6182	3.9515	10	HLC
PPR8	Stating bid submission and bid opening information	3.6667	4.0922	3.8174	4.4265	4.0270	3.6636	3.9489	11	HLC
PPR11	Tender analysis using professionals	3.6500	4.0142	4.0000	4.2206	4.2162	3.5545	3.9426	12	HLC
PPR23	Right of public to inspect procurement proceedings	3.6042	4.0071	3.8174	4.2647	4.2703	3.5909	3.9258	13	HLC
PPR1	Establishment of procurement planning committee	3.7396	3.9291	3.9304	3.9926	4.3784	3.5727	3.9238	14	HLC
PPR3	Budgetary provision before initiating procurement	3.5917	4.0426	3.8957	4.1397	4.2703	3.4818	3.9036	15	HLC
PPR22	Preservation of records of procurement proceedings	3.7104	4.0426	3.7217	4.1985	4.0811	3.6645	3.9031	16	HLC
PPR18	Composition of tender boards	3.8188	3.8652	3.8783	4.0809	4.0811	3.6545	3.8965	17	HLC
PPR14	Collection of letter or no objection from BPP	3.5333	4.0142	3.9565	4.1103	4.1622	3.5909	3.8946	18	HLC
PPR24	Exclusion of parties with interests from procurement	3.5687	3.8794	3.8087	4.1618	4.1081	3.7455	3.8787	19	HLC
PPR21	Obtaining a priori permission for projects above thresholds	3.8667	3.9645	3.6087	4.1471	4.1081	3.5364	3.8719	20	HLC
PPR20	Verification of performance warranties	3.6146	3.9574	3.7913	4.1912	4.0541	3.5818	3.8651	21	HLC
PPR12	Submission and consideration of tender report	3.7938	3.8440	3.9043	3.9853	4.0541	3.5727	3.8590	22	HLC
PPR10	Feedback to bidders stating reasons for unsuccessful bid	3.5062	3.8298	3.9652	4.1324	4.0000	3.6182	3.8420	23	HLC
PPR19	Obtaining performance bond	3.1458	4.1064	3.7913	4.1765	4.2432	3.5273	3.8318	24	HLC
	Average mean	3.6965	3.9932	3.8761	4.1973	4.2376	3.6042	3.9341		HLC

HLC- High Level of Compliance

4.5. Difference in the Level of Compliance of Public Procurement Regulations among Tertiary Institutions in Nigeria

Table 5 shows the result of Kruskal Wallis test that was conducted to test the hypothesis which states that there is no significant difference in the level of Compliance of Public Procurement Regulations among Tertiary Institutions in Nigeria. The P-value of 0.001 is less than 0.05 significance level, hence the hypothesis was rejected. This indicates that there

is a significant difference in the level of compliance of public procurement regulations among tertiary institutions in Nigeria.

Table 5: Kruskal Wallis Test for Comparing the Level Compliance of Public Procurement Regulations among Tertiary Institutions in Nigeria

Level of Compliance with Public Procurement Regulations among Tertiary Institutions in Nigeria	Mean Rank	Decision @ 0.05 Sig. level.
South- South	35.04	
South West	82.75	
North Central	61.06	
North East	116.63	
North West	119.85	
South East	19.67	
Chi- Square	118.907	
D.F	5	
P-Value	0.001	Reject

Source: Researcher's Field Data (2023)

4.6. Post Hoc Test on the Level Compliance of Public Procurement Regulations among Tertiary Institutions in Nigeria

The result of post hoc test on level of Compliance with Public Procurement Regulations among Tertiary Institutions in Nigeria is shown in Table 6. Because of the significant level in the level of Compliance of Public Procurement Regulations among Tertiary Institutions in Nigeria, a post hoc test was conducted on the geopolitical zones using Bonferroni and Dunnest test (Bonferroni-Dunn test) to determine the source(s) of the difference. The result of Bonferroni's multiple comparisons and Dunnest test show that South – East is the source of the variation/ difference. This was validated by Dunnest test result which showed that the other five zones have P-values less than 0.05 significant level, except South -East which has the P-value (0.07) greater than 0.05.

Table 6: Post Hoc Test on the Level Compliance of Public Procurement Regulations among Tertiary Institutions in Nigeria

	(I) Political Zones In Nigeria	(J) Political Zones In Nigeria	Mean Difference (I-J)	Std. Error	Sig	95% Confidence Interval Lower Bound	Upper Bound
Bonferroni	South- South	South West	-.29675*	.03624	.000	-.4050	-.1885
		North Central	-.17964*	.03624	.000	-.2879	-.0714
		North East	-.50086*	.03624	.000	-.6091	-.3926
		North West	-.54117*	.03624	.000	-.6494	-.4329
		South East	.09225	.03624	.180	-.0160	.2005
	South West	South- South	.29675*	.03624	.000	.1885	.4050
		North Central	.11712*	.03624	.023	.0089	.2254
		North East	-.20410*	.03624	.000	-.3123	-.0959
		North West	-.24442*	.03624	.000	-.3527	-.1362
		South East	.38900*	.03624	.000	.2808	.4972
	North Central	South- South	.17964*	.03624	.000	.0714	.2879
		South West	-.11712*	.03624	.023	-.2254	-.0089
		North East	-.32122*	.03624	.000	-.4295	-.2130
		North West	-.36153*	.03624	.000	-.4698	-.2533
		South East	.27189*	.03624	.000	.1636	.3801
	North East	South- South	.50086*	.03624	.000	.3926	.6091
		South West	.20410*	.03624	.000	.0959	.3123
		North Central	.32122*	.03624	.000	.2130	.4295
		North West	-.04031	.03624	1.000	-.1486	.0679
		South East	.59311*	.03624	.000	.4849	.7014
	North West	South- South	.54117*	.03624	.000	.4329	.6494
		South West	.24442*	.03624	.000	.1362	.3527
		North Central	.36153*	.03624	.000	.2533	.4698

Dunnett t (2-sided) ^b	South East	North East	.04031	.03624	1.000	-.0679	.1486
		South East	.63342*	.03624	.000	.5252	.7417
		South- South	-.09225	.03624	.180	-.2005	.0160
		South West	-.38900*	.03624	.000	-.4972	-.2808
	North Central	North West	-.27189*	.03624	.000	-.3801	-.1636
		North East	-.59311*	.03624	.000	-.7014	-.4849
		North West	-.63342*	.03624	.000	-.7417	-.5252
		South South	.09225*	.03624	.070	.0001	.1844
	South- East	South South	.38900*	.03624	.000	.2969	.4811
		South South	.27189*	.03624	.000	.1798	.3640
		South South	.59311*	.03624	.000	.5010	.6852
		South South	.63342*	.03624	.000	.5413	.7255

*. The mean difference is significant at the 0.05 level

4.7. Level of Application of Sustainable Contract Administration Practices in Construction Project Execution in The Tertiary Education Sector in Nigeria

Table 7 shows the level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in Nigeria. The decision rule is that any sustainable contract administration practices that has mean score ranging between 1-1.49, 1.5- 2.49, 2.5-3.49, 3.5-4.49, and 4.5-5.0 is considered to have very low level of application, low level of application, moderate level of application, high level of application, and very high level of application respectively.

Table 7 reveals the sustainable contract administration practices with high level of application during construction project execution in the tertiary education sector in Nigeria. These include continuous improvement and learning (MS=3.9411), promotion of collaboration in project delivery (MS=3.8077), waste reduction strategies during construction (MS=3.8032), Promotion of diversity in construction (MS=3.7943), and supporting ethical responsibility such as fair labour practices, protecting human rights, and ensuring that the project benefits local communities (MS=3.7907). In addition, inclusive stakeholders' involvement (MS=3.7755), and setting clear sustainability targets and monitoring progress (MS= 3.7038) also recorded high level of application during construction project execution in the Tertiary sector in Nigeria. Furthermore, capacity building and knowledge sharing among stakeholders (MS=3.3103), development of construction Waste Management Plan (MS=3.2402), Provisions related to energy efficiency, water conservation, waste reduction, and indoor environmental quality (IEQ) (MS=3.2101), promotion of innovation and building a culture of sustainability (MS=3.1580), development of construction Waste Management Database (MS=3.0340), Consideration of life cycle analysis in project delivery (MS=3.0307), Enhancement of innovation (MS=3.0076), use of sustainable materials (recycled or locally sourced materials) (MS=2.9904), and implementation of renewable energy systems, such as solar or wind power (MS=2.9739) recorded moderate level of application during construction project execution in the Tertiary Education Sector in Nigeria. The group mean scores of 3.4142, 3.4358, 3.4480, 3.4278, 3.3664, and 3.3985 implied that there was moderate level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in South- South, South West, North Central, North East, North West, and South East respectively. The average mean score of 3.4107 implied that there was moderate level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in Nigeria.

Table 7: Level of Application of Sustainable Contract Administration Practices in Construction Project Execution in The Tertiary Education Sector in Nigeria

Code	VARIABLES	South- South Mean	South West Mean	North Central Mean	North East Mean	North West Mean	South East Mean	Group Mean	Rank	Remark
SCA13	Enhances continuous improvement and learning	3.9832	4.0342	3.8848	4.2932	3.7921	3.6591	3.9411	1	HLAPP
SCA9	Promote collaboration in project delivery	3.8721	3.8934	3.9021	3.7832	3.6745	3.7211	3.8077	2	HLAPP
SCA14	Mandates waste reduction strategies during construction	3.7742	3.9075	3.8125	3.8775	3.6741	3.7732	3.8032	3	HLAPP
SCA11	Promotes diversity in construction	3.5816	3.9973	3.8867	3.6562	3.7869	3.8573	3.7943	4	HLAPP
SCA10	Support ethical responsibility such as fair labour practices, protecting human rights, and ensuring that the project benefits local communities	3.6512	3.8743	3.9231	3.6658	3.8965	3.7331	3.7907	5	HLAPP
SCA4	Inclusive stakeholders' involvement (including local communities)	3.6734	3.8561	3.7741	3.5951	3.7721	3.9823	3.7755	6	HLAPP
SCA5	Set clear sustainability targets and monitoring progress	3.6552	3.5467	3.8843	3.6712	3.9021	3.5634	3.7038	7	HLAPP
SCA7	Provide for capacity building and knowledge sharing among stakeholders	3.3242	3.4681	3.5571	3.1247	3.1143	3.2732	3.3103	8	MLAPP
SCA16	Mandates the development of construction Waste Management Plan	3.2402	3.1482	3.3125	3.3726	3.1482	3.2192	3.2402	9	MLAPP
SCA1	Provisions related to energy efficiency, water conservation, waste reduction, and indoor environmental quality (IEQ)	3.3531	3.1542	3.1221	3.3341	3.0438	3.2531	3.2101	10	MLAPP
SCA8	Promote innovation and build a culture of sustainability	3.2156	3.1385	3.1289	3.2164	3.0341	3.2143	3.1580	11	MLAPP
SCA15	Mandates the development of construction Waste Management Database	2.9821	3.1632	3.0153	2.9854	3.1623	2.8959	3.0340	12	MLAPP
SCA6	Consider life cycle analysis in project delivery	2.9921	3.0184	2.8327	3.2245	3.2421	2.8746	3.0307	13	MLAPP
SCA12	Enhances greater innovation	3.1309	2.7645	3.1297	3.1341	2.9989	2.8872	3.0076	14	MLAPP
SCA2	Requirements related to the use of sustainable materials (recycled or locally sourced materials)	3.2103	2.8765	3.0187	2.7689	2.9456	3.3424	2.9904	15	MLAPP
SCA3	Implementation of renewable energy systems, such as solar or wind power	2.7843	3.1322	2.9832	3.1421	2.6753	3.1261	2.9739	16	MLAPP
Average mean		3.4142	3.4358	3.4480	3.4278	3.3664	3.3985	3.4107		MLAPP

HLAPP- High Level of Application, MLAPP- Moderate Level of Application

4.8. Kruskal Wallis Test for Comparing the Opinion of respondents on Level of Application of Sustainable Contract Administration Practices in Construction Project Execution in The Tertiary Education Sector in Nigeria

Table 8 shows the result of Kruskal Wallis test that was conducted to test the hypothesis which states that there is no significant difference in the opinion of Tertiary Institutions on level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in Nigeria. This test was carried out among the opinions of the Tertiary Institutions in various geopolitical zones with the expectation that the locational characteristics may have influence on the extent of application of the sustainable contract administration practices in construction project execution in the Tertiary institutions. The P-value of 0.986 is greater than 0.05 significance level, hence the hypothesis was accepted. This indicates that there is no significant difference in the opinion of institutions on level of application of sustainable contract administration practices in construction project execution in the tertiary education sector in Nigeria. The possible reason for this is presented in the discussion section of this article.

Table 8: Kruskal Wallis Test for Comparing the Opinion of respondents on Level of Application of Sustainable Contract Administration Practices in Construction Project Execution in The Tertiary Education Sector in Nigeria

Level of Application of Sustainable Contract Administration Practices in Construction Project Execution in The Tertiary Education Sector in Nigeria	Mean Rank	Decision @ 0.05 Sig. level.
South- South	45.56	
South West	51.59	
North Central	50.84	
North East	49.06	
North West	45.94	
South East	48.00	
Chi- Square	0.636	
D.F	5	
P-Value	0.986	Accept

4.9. Discussion of Results

This section discusses the findings of this study with respect to the objectives, and hypotheses.

Level of compliance of public procurement regulations among selected Tertiary Institutions

The evaluation of level of compliance/adherence to public procurement regulations among selected Tertiary Institutions indicated high level of compliance of public procurement regulations among Tertiary Institutions in South- South, South- West, North-Central, North- East, North- West, and South- East. The study revealed that there is high level of compliance to public procurement regulations among Tertiary Institutions in Nigeria. This could be attributed to series of seminars and workshop on the need to comply to public procurement regulations among Tertiary Institutions in Nigeria. The result of the hypothesis which states that there is no significant difference in the level of compliance of public procurement regulations among Tertiary Institutions in Nigeria showed that there is significant difference in the level of Compliance to Public Procurement Regulations among Tertiary Institutions in Nigeria, hence the hypothesis was rejected. The result indicated that the level of compliance to public Procurement Regulations among Tertiary Institutions in South East is significantly different from other five regions in Nigeria. This implies that location of institution can influence the extent of compliance to public procurement regulations. This study is in agreement with Yahaya *et al.* (2019) and Buba *et al.* (2020) who posited that there is improvement in the level of awareness and implementation of the Public procurement regulations. The study is also in consonance with Adetoro *et al.* (2015) who assessed the level of compliance with procurement regulations in Nigeria's federal

universities. The study revealed that there was some level of compliance. However, this study is in contrast with Bamidele (2020a) who reported that there have been cases of non-compliance and corruption in the procurement process. This has resulted in the mismanagement of public funds, poor implementation of projects, and substandard delivery of services

Level of Application of Sustainable Contract Administration Practices in Construction Project Execution in The Tertiary Education Sector in Nigeria

The level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in Nigeria was evaluated. The result revealed that there is high level of continuous improvement and learning as well as promotion of collaboration among the professionals and other stakeholders in project delivery. Furthermore, waste reduction strategies were highly applied during construction, and promotion of diversity in construction was encouraged. Ethical responsibility such as fair labour practices, protecting of human rights, and development of projects that benefit local communities were highly supported and encouraged. In addition, inclusive stakeholders' involvement, and setting clear sustainability targets and monitoring progress also recorded high level of application during construction project execution in the Tertiary sector in Nigeria. However, capacity building and knowledge sharing among stakeholders, development of construction waste management plan, provisions related to energy efficiency, water conservation, waste reduction, and indoor environmental quality (IEQ), promotion of innovation and building a culture of sustainability, development of construction waste management database, consideration of life cycle analysis in project delivery, enhancement of innovation, use of sustainable materials (recycled or locally sourced materials), and implementation of renewable energy systems, such as solar or wind power recorded moderate level of application during construction project execution in the tertiary education sector in Nigeria. The group mean scores of 3.4142, 3.4358, 3.4480, 3.4278, 3.3664, and 3.3985 implied that there was moderate level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in South- South, South West, North Central, North East, North West, and South East respectively. The average mean score of 3.4107 implied that there was moderate level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in Nigeria. The level of application of contract administration observed in this study is somehow in line with the findings of Oppong (2019), which analysed the effect of contract administration on project completion and attainment of project objectives in basic school construction in greater Accra region by free senior high school secretariat of the ministry of education in Ghana. The study noted that the objectives were achieved satisfactorily in terms of corporate culture quality, strategic quality management, and quality improvement measurement systems. Other indicators that performed satisfactorily include people and customer management, operational quality planning, external interface management, and supplier partnership. Furthermore, teamwork structures, customer satisfaction orientation, and communication of improvement information performed satisfactorily. In terms of contract administration, right materials are procured at the right place, right time, at the right price with the right quality and quantity thereby leading to successful completion of the project. The moderate level of application of sustainable contract administration practices in construction project execution in the tertiary education sector in Nigeria as found in this study is an indication that further improvement is required to enhance general performance of contracts. This agrees with the study of Njagi *et al.* (2020) who stated that the community is involved in contract administration to a great extent through; supplier identification, project negotiations, actual supplying of local available construction materials and ensuring compliance/adherence to contractual terms and conditions by the contractors are of great importance. The study posited that an improvement in contract administration in public based projects leads to a positive improvement in sustainable procurement management in devolved systems of Government in Kenya.

The result of the hypothesis which states that there is no significant difference in the opinion of Tertiary Institutions on level of application of sustainable contract administration practices in construction project execution in the tertiary education sector in

Nigeria indicated that there is no significant difference in the opinion of institutions on level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in Nigeria (P-value of 0.986), hence the hypothesis was accepted. This may be attributed to the fact that respondents have common or similar level of opinion/knowledge on the level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in Nigeria, as Mugabe *et al.* (2019) stated that all concerned stakeholders/players are somehow aware that the bottom line to project success lies in the manner and extent in which the contract is administered, hence they must do their best to apply sustainable contract administration practices. This study is in agreement with Oyedele *et al.* (2018) who stated that sustainable contract administration emphasizes the importance of collaborative relationships between the parties involved in the construction project, including the contractor, client, and other stakeholders. This study is also in alignment with Tetteh *et al.* (2019) who posited that sustainable contract administration in construction is the integration of sustainability principles into the procurement and management of construction contracts. This approach aims to promote environmental, social, and economic sustainability throughout the construction process, from the design stage to the end of the contract.

5. CONCLUSION AND RECOMMENDATIONS

This study evaluated the level of compliance with public procurement regulations in the tertiary education sector construction project delivery in Nigeria and found that there is high level of compliance with public procurement regulations in the tertiary education sector construction project delivery in Nigeria. It also found that the level of Compliance of Public Procurement Regulations among Tertiary Institutions in South – East is significantly different from other zones in Nigeria. It is therefore concluded that, though there is generally high compliance with public procurement regulation, the extent of compliance is not the same indicating that location of an institution can influence the extent of compliance to public procurement regulations probably due to inadequate priority given to some factors like, preserving the integrity of the public procurement system through general standards and procurement-specifics, consideration for best value for money and effective risk management.

This study assessed the level of application of sustainable contract administration practices in construction project execution in the tertiary education sector in Nigeria and found that there was moderate level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in Nigeria. It also found that there is no significant difference in the opinion of institutions on opinion of respondents on level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in Nigeria. It is therefore concluded that though the level of application of sustainable contract administration practices in construction project execution in the Tertiary Education Sector in Nigeria is moderately same among the various zones, yet this has not attained the optimal level needed for optimal performance of construction contracts in the Tertiary Education Sector in Nigeria.

Based on the findings and conclusion of this study, the following recommendations were thus proffered.

- i. All government agencies and stakeholders should ensure that a very high level of compliance with procurement regulation is equally attained among the institution in all the zones by preserving the integrity of the public procurement system through general standards and procurement-specifics, consideration for best value for government money and risk management.
- ii. Tertiary institutions in Nigeria should improve on the level of application of sustainable contract administration practices by improving top management support, corporate governance, professionalism in public procurement, effective stakeholder participation, and organizational culture.

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