



## Schedule Performance of Tertiary Education Trust Fund Construction Projects in Public Institutions of Tertiary Education in South-East, Nigeria

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### ABSTRACT

*Tertiary Education Trust Fund (TETFund) construction project delivery in Nigeria is the biggest benefactor to its public tertiary education institutions. To measure the Fund 's delivery performance, an important factor in measuring project performance is timely completion at an agreed price and in specified quality. However, despite the growing concerns on the poor time performances of the Fund 's construction projects delivery, time overrun still a common problem without effective solution. Hence, the study interrogated the Fund 's projects delivery in the southeast. The objectives of this analysis aim at establishing the time performance of TETFund construction project delivery in the public tertiary education institutions in Southeast, Nigeria from 2015 to 2021. One hundred and nineteen (119) TETFund construction projects in the 7 public tertiary institutions in Enugu State were sampled using single-stage cluster sampling technique. 140 structured questionnaires were developed and distributed to consultants, contractors and other key Personnel involved in each TETFund intervention projects. The data was analysed using frequency, percent student 's t test. The result revealed that the prevalence of time overrun on the Fund 's project is 72% out of the 119 TETFund sponsored construction projects in Enugu state public tertiary education. Of the total, 28% (33) were completed on schedule, 29% (35) experienced time overruns, 39% (46) were ongoing beyond their project schedule while 4% (5) were abandoned. The mean estimated project cost by consultants was significantly lower than the awarded sums ( $t = 2.411$ ,  $p = 0.018$ ). The paper concludes that to improve the Fund 's projects time performance regarding fixed price and materials price escalation, the materials 'component of the bill should be extracted and paid to the contractor in advance, for procurement.*

**Keywords:** Public Tertiary Education; Trust Fund Construction Projects; Schedule Performance; TETFund Construction Project Delivery

## Introduction

The Nigerian public education institutions of higher learning have endured long years of both physical and academic infrastructure decay caused by insufficient funding for the provision of these facilities and rehabilitation of decaying ones (Isa & Yusoff, 2015). To ensure that the Nigerian government is alive to the responsibility of funding its education sector, the Academic Staff Union of University (ASUU) and the Ministry of Education have been in continuous dialogue resulting in serial industrial actions. In addressing the problem, the Tertiary Education Trust Fund (TETFund) was established. TETFund was set up to administer and disburse education tax collections to all public tertiary educational institutions in Nigeria. The Fund operates with the 2% education tax paid from the assessable profit of registered companies in Nigeria. The Act setting up the Fund also issued guidelines for dispensing the education tax accruals to Universities, Polytechnics and Colleges, in the ratio 2:1:1, respectively (TETFund, 2020). Since the Act in 2011, the Fund has been responsible for the development, provision and delivery of these infrastructure in Nigeria public tertiary institutions. Although, Fund 's intervention has impacted positively on these institutions (Mangwat, Ewuga & Izam 2018, TETFund, 2020), poor performances have been observed in the Funds projects delivery in these institutions in Nigeria (Gambo Ibrahim, Iliyasa, Shakantu & Lamina, 2017; Aghimien & Aigbavboa, 2018; Mangwat, et al., 2018; Zailani, Kolo & Abubkar, 2019). Recent studies (Gambo et al., 2017; Aghimien et al, 2018; Zailani et al., 2019) have reported time overrun on the Fund's projects. Aghimien et al. (2018) reported that the time overrun experienced in 12 out of 14 of the fund's projects in Ondo State, Nigeria, within 2006 to 2016, was beyond double of the initial scheduled time. Following that, a number of studies have been carried out both nationally and internationally to establish the causes of overruns in the construction industry. The role of Construction industry in the development of any given nations is significant (Al Khudhuri, 2020) and provision of these physical facilities such as lecture hall and theatres, seminar rooms and halls, academic offices, laboratories and hostels to mention a few, in academic institutions have impacted positively on the academic performance, safety and comfort of students (Saeed and Kayani, 2019).

Doing so timeously, within budget and quality, is one of the key indicators of successful performance in the construction industry (Kadiri & Shittu, 2015; Gupta & Kumar, 2020). However, construction projects delivery, in most cases, are marked with serious time overruns (Amu & Adesanya, 2011). Time overruns, aside being common in construction industry world over, Ojo, (2021) observed that it is rampant across TETFund projects. In Construction industry, Time overrun is the Lateness in completion of work or extension of the completion time of a project from its scheduled duration (Elinwa & Joshua, 2001; Akhund, et al, 2018; Luvara, et al., 2018). Time overrun is a global problem amounting to more than 100% of the scheduled project time (Sinesilassie, Tabisha & Jha, 2017; Hassan, Suleiman & Malik., 2014; Ndunguru, Niyonyungu & Yang, 2019). Although studies have been carried out on the TETFund project delivery performance (Gambo, et al., 2017; Aghimien et al., 2018; Khudhuri, 2020), none have assessed the Fund's time performance in its project delivery in public tertiary education institutions in the Southeast, Nigeria. Therefore, this study aims to establish the performance success or otherwise of the Fund 's construction project delivery in public tertiary education trust fund (TETFund) projects in south east Nigeria through following objectives:

1. Determination of the Characteristics of TETFund Projects.
2. Determination of prevalence of Time Overruns in TET Fund Projects.
3. To make recommendations to stakeholders on strategies for improving the Fund 's time performance in construction project delivery.

## Literature Review

### Overruns in Construction Projects

Poor schedule and cost performances in construction industry is a global problem (Emam, et al., 2014; Johnson & Babu, 2018; Al Khudhuri, 2020). Akhund, et al. (2018) studied the factors contributing to time overrun in public sector construction projects in Pakistan and ranked financial difficulties faced by constructors, inadequate planning and scheduling, client 's financial difficulties and delayed payments by the client, as the most significant factors of time overrun. Othman, Nair & Nuruddin (2017) studied the critical factors that lead to time overrun in construction project in Malaysia and reported pre-contract issues, project management and contractor 's site management as responsible. In India, Pourrostam & Ismail (2012) reported that 52.1 % of projects ran behind their original/contract schedule. Gupta & Kumar (2020) studied the factors causing cost and time overrun in construction projects, and concluded that the top five factors responsible for time overrun include; Material selection and changes in types and specifications during construction, Poor equipment maintenance, Shortage of materials, Financing between the client and the contractor, labor shortage.

Those of cost include; Inflation and escalation of material prices, variation, high transportation cost, frequent breakdowns of plant and equipment and rework due to errors during construction. Hatkar & Hedao (2016), opined that time overrun is caused delay in progress payments by client, improper project planning and scheduling, inadequate fund allocation and escalation of material prices were responsible. Akal, Abu El-Marty & El-Hamrawy (2017) linked Insufficient and ineligible contractor 's technical staff to accomplish the project, Delay in freeing the main contractor 's financial payments by clients, equipment inefficiency, Contractor 's difficulties in financing the project and Equipment and construction materials shortage to the poor performances in the Egyptian construction industry. In Dar-Es-Salaam, Tanzania, Jongo, et al. (2019) reported that project schedule overrun is a common problem occurring frequently in project cycle while observing that construction project is a high-risk venture which must be effectively managed at all stages to avoid overruns.

### Overruns in Construction Projects in Nigeria

Amu and Adesanya (2011) reported that of 3, 407 civil engineering projects executed, only 24 were completed on schedule. 1571 suffered schedule overrun while 1812 were abandoned.

### Time Overruns in TETFund Construction Projects

In Nigeria, Aghimien et al. (2018) studied the Performance of Selected Funding Schemes Used in Delivering Educational Buildings in Nigeria and reported general poor time performance on educational buildings delivered through TET Fund interventions. Mangvwat et al. (2018) interrogated the performance of firm price building contracts in tertiary institutions in Plateau State, and reported that all the 23 building projects in three tertiary institutions in the State contracted and completed under the Fund 's intervention programme between 2005 and 2014, suffered time overrun while 5 out of the 23, suffered cost-overrun. Gambo, et al. (2017) evaluated stakeholders' perception on TETFund construction projects in Ahmadu Bello University, Zaria from 2009 – 2011 and reported unsuccessful performance.

They observed that delay in progress payment, materials price escalation, shortage of materials and low technical skill of the project leader were the leading factors responsible for the poor project performance. Emenike (2010) had submitted that late and non-payment results in liquidity problems, Ojo & Babalola (2018) blamed delayed payment on clients, Odenigbo, et al. (2020) linked client 's withholding payment, clients 'bad financial sources, client 's inadequate fund management and client 's cumbersome administrative process accounted for the delay payment. Time overrun on TET Fund a sponsored project in Nigeria is sometimes caused by delayed a payment which, in turn, affects the contractor 's cash flow, negatively (Odenigbo et al., 2020). Contractor 's liquidity requires serious attention regarding payments (as and when due) as Ojo (2021) has shown that irregular payment pattern occasioned by the Institution 's bureaucracy is responsible for contractor 's negative liquidity and as such resulting in projects delay.

## Materials and Method

The study was carried out in Enugu State. The public tertiary education institutions sampled include: Universities (University of Nigeria (UNN), Nsukka and Enugu campuses, Enugu State University of Science and Technology (ESUT), Agbani), polytechnics (Institute of Management and Technology (IMT), Enugu, Federal Dental School, Enugu) Colleges (Federal College of Education, Eha-Amufu, College of Agriculture, Iwollo and Enugu State College of Education Technology (ESCET), Enugu).

The study was carried out using descriptive survey research design. 119 TET Fund projects in the 7 public tertiary education institutions were sampled using single-stage cluster sampling technique. In achieving the objectives of the study, structured questionnaires are designed from a review of current literature. The questionnaire was pre-tested for validity and reliability before administering. The questionnaires were distributed amongst consultants, contractors, key TET Fund staff, TET Fund desk officers and host institution 's Physical Planning units within the sample. A case study of the Fund's construction projects awarded between 2015 and 2021 in all the tertiary institutions in the state was carried out to ascertain their time performances. Descriptive statistics which include frequency and percentages were used to summaries categorical variables while means and standard deviations were obtained for continuous variables. Mean comparisons were done using student 's t test. P value less than 0.05 was regarded as significant and results were presented in tables and charts. All the analysis were done using the IBM SPSS version 23 for windows

## Results

There were more male respondents (62.2%) than females (37.8%) and most of them are married (86.6%). More than half of the respondents (61.4%) are less than 45 years of age, 41.2% are civil servants and 31.1% are Architects while 21% are public servants. The respondents were educated up to tertiary level (99%), professionally trained (100%), registered members to respective bodies in the built environment (72%) and as such, informs that majority of the respondents possessed adequate knowledge and cognate experience on the subject matter enough to provide needed information and justify the robustness of the data used for the study (table 1).

**Table 1: Demographic Characteristics of the Respondents**

	Frequency	Percent
<i>Title</i>		
<i>Prof.</i>	2	1.7
<i>Dr.</i>	7	5.9
<i>Mr.</i>	71	59.7
<i>Mrs.</i>	39	32.8
<i>Level of Education</i>		
<i>Secondary</i>	1	0.8
<i>Tertiary</i>	118	99.2
<i>Sex</i>		
<i>Male</i>	74	62.2
<i>Female</i>	45	37.8
<i>Marital Status</i>		
<i>Single</i>	16	13.4
<i>Married</i>	103	86.6
<i>Age group</i>		
<i>30 -34</i>	7	5.9
<i>35 – 39</i>	52	43.7
<i>40 -44</i>	14	11.8
<i>45 – 49</i>	10	8.4
<i>50 -54</i>	15	12.6
<i>55 – 59</i>	7	5.9

<i>60 and above</i>	14	11.8
<i>Occupation</i>		
<i>Civil servant</i>	49	41.2
<i>Architect</i>	37	31.1
<i>Engineering</i>	5	4.2
<i>Public servant</i>	25	21.0
<i>Site electrician</i>	2	1.7
<i>Contractor</i>	1	0.8
<i>Professional training</i>		
<i>Architect</i>	62	52.1
<i>Structural Engineer</i>	21	17.6
<i>Electrical Engineer</i>	8	6.7
<i>Mechanical Engineer</i>	2	1.7
<i>Quantity Surveyor</i>	4	3.4
<i>Builder</i>	18	15.1
<i>Others</i>	4	3.4
<i>Registration with professional body</i>		
<i>Yes</i>	86	72.3
<i>No</i>	33	27.7
<i>Current position</i>		
<i>Heads of departments</i>	1	0.8
<i>director of work &amp; service</i>	7	5.9
<i>Principal Technical Officer</i>	16	13.4
<i>Executive officer</i>	1	0.8
<i>Principal partner</i>	33	27.7
<i>Project supervisor</i>	2	1.7
<i>Principal engineer</i>	2	1.7
<i>Senior engineer</i>	2	1.7
<i>Principal planning officer</i>	1	0.8
<i>Engineer I</i>	1	0.8
<i>Architect I</i>	3	2.5
<i>Higher Technical Officer</i>	5	4.2
<i>Principal architect</i>	4	3.4
<i>Assistant chief engineer</i>	1	0.8
<i>Senior architect</i>	1	0.8
<i>Deputy director</i>	2	1.7
<i>Director physical planning</i>	9	7.6
<i>Member</i>	8	6.7
<i>Staff</i>	12	10.1
<i>Chief Quantity Surveyor</i>	3	2.5
<i>Site manager</i>	5	4.2
<i>Condition of service</i>		
<i>career</i>	68	57.1
<i>tenured</i>	14	11.8
<i>others</i>	37	31.1

The projects were initiated by either the host institution (43%) or by TET Fund in collaboration with host the institution (41%) and funded wholly by the TETFund (100%). Project funds were released to host institution in 3 tranches (99%) and mostly at TET Fund's discretion (66.4%) as shown in *table 2*

**Table 2: Project Funding**

	Frequency	Percent
<i>How are TET Fund projects initiated</i>		
By TET Fund	12	10.1
By host institution	51	42.9
TET Fund in collaboration with host institution	49	41.2
By an influencer	7	5.9
<i>How are TET Fund projects funded</i>		
wholly by TET Fund	119	100.0
<i>How are the project funds released to host institution</i>		
wholly	1	0.8
in tranches	118	99.2
<i>How many tranches</i>		
2 - tranche	2	1.7
3 - tranche	110	93.2
as need arise	6	5.1
<i>Time interval (weeks) before release of funds</i>		
not greater than 8 weeks	6	5.0
at TET Fund discretion	79	66.4
any time they are ready	26	21.8
any time fund is available	8	6.7

The projects were executed at fixed price contract (84.9%) and open tendering were used for both the selection and execution of the contracts (table 3) while table 4 showed that the consultants estimated project costs were significantly lower than their awarded sums ( $t = 2.411, p = 0.018$ ).

**Table 3: Project Information**

	Frequency	Percent
<i>Designed by professionals</i>		
Yes	119	100.0
No	0	0.0
<i>Contract type</i>		
Measurement	10	8.4
Firm price	101	84.9
Turnkey	8	6.7
<i>Selection of consultants and contractors</i>		
Open	82	68.9
Selective	37	31.1
<i>Mode of tendering</i>		
Open	91	76.5
Selective	28	23.5

**Table 4: Comparison of Mean Consultant's Estimated Total Cost and Award Sum**

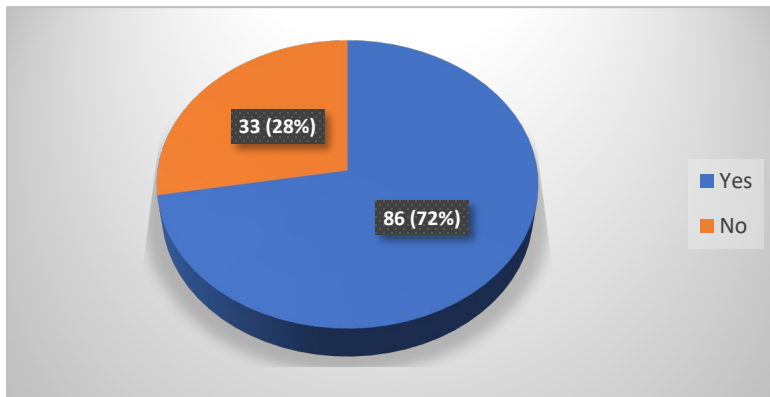
	Consultant's Estimated total Cost Mean $\pm$ SD	Award sum Mean $\pm$ SD	t	P value
Project Cost	220023453.3 $\pm$ 165722068.7	241960224.6 $\pm$ 147504384.6	2.411	0.018

Table 4 shows that the mean estimated project cost by consultants was significantly lower than the awarded sum ( $t = 2.411, p = 0.018$ ).

**Table 5: Performance Status of TET Fund Projects in Enugu State in the last six (6) years**

<i>Project status</i>	<i>Frequency</i>	<i>Percent</i>
<i>Completed as scheduled</i>	33	28
<i>Completed beyond scheduled date</i>	35	29
<i>Still ongoing</i>	46	39
<i>Abandoned</i>	5	4

Table 5 shows that out of 119 TET Fund sponsored projects sampled in Enugu State, 28% were completed on schedule, 29% were completed after the scheduled date, and 39% are ongoing while 4% were abandoned.

**Fig 1: Time Overrun**

Eighty-six Tetfund projects which represents 72% of the TET Fund projects executed from 2015 to 2021 in public tertiary education institutions in Enugu State suffered time overruns (figure 1).

### Discussions

TET Fund construction Projects follow due diligence plus extra measures to ensure compliance and safety of funds released for projects. The procurement guidelines and requirements leading to ultimate awards, apparently stringent, aim at providing level playfield amongst qualified and competent contractors, constituted a delay between initiation and awards, and as consequence responsible for award sums being significantly higher than their consultants ETC as economic/inflationary activities escalates material prices in the region. It also responsible for the low bids and award sums. In some of the cases interviewed, respondents opined that the time between financial bid and contract awards took more than 60 days while the time between award and release of funds to contractors took more than 30 days. In fixed price construction contracts, awards and execution of construction projects in economy that depended on dollar inflow, experiencing inflation resulting in material price escalation is akin to standing reason its head. Fund releases at the Fund's discretion (table 2, Para. 5.2) suggests waiting patiently (delayed payment) which indicates non-compliance to prompt payment within the stipulated time as observed in Mukuka, et al. (2014), Gambo et al. (2017), Odenigbo et al. (2020), and Ojo (2021). The Results in table 4 showed that the consultants estimated project cost on most of the projects were significantly lower than their awarded sums ( $t = 2.411$ ,  $p = 0.018$ ). This suggests that time windows between pre and post contract affected the consultants estimated project costs. The poor time performance (72%) experienced in the fund's construction project delivery system (table 6 and figure 1) can be linked to tables 3, (2.2 and 4.2) which can best be analysed that because the projects were awarded through open bid/tender based on the lowest price basis (Olatunji, 2008; Mangvwat, et al., 2018) and at a firm (rigid) price, idle contractors chasing the few jobs could have bid at low rates.

Lowest bidder without adequate considerations to inflationary rates is acceptable since the contract prequalification has conferred qualification and competence on the contractor. As a consequence, the projects result in poor time performances at slight fluctuation, poor quality work and workmanship which aligned with Olatunji (2008) and Mangat, et al. (2018) that public projects in Nigeria awarded based on the lowest price weakens competition and led to contractors bidding with ridiculous rates while delivering very low-quality work and workmanship.

Furthermore, because the project costs are rigidly fixed, the quality performance of the project is either ignored or traded-off with poor time performance which agreed with Mangvwat, et al. (2018) that there is a trade-off in the quality performance of TET Fund project as contractors tries to meet the fixed price target and the trade-off, in turn, will be succeeded by higher maintenance cost of the facility.

TET Fund Projects are characterised by schedule overrun as observed in Gambo et al. (2017) and Aghimien et al. (2018) have seriously affected the Fund's projects delivery performances negatively. Table 5 shows that out of 119 TET Fund projects in the sample, only 33 (28%) were completed on schedule, 35 (29%) suffered time overrun while 46 (39%) are still ongoing beyond their initial project schedule while 5 (4%) were abandoned. For clarity, Table 6 and Figure 1 showed that 86 (72%) of the TET Fund projects executed from 2015 to 2021 in public tertiary education institutions in Enugu State suffered serious time overruns. Ojo (2021) described the insistent time overrun in the Fund's construction project delivery and blamed it on delayed payment at institutions' bursary bureaucracy. He recommended orientation program bursary department and the management to enlighten them on the imperatives of time in processing payment certificates. Reasons for this high prevalence may be related to type of project bidding and award system used by the Fund which is consistent with Prajapati, et al. (2015) and inflationary rates as corroborated by Diugwu, et al. (2017). Because the contract price is firm (fixed), the concomitant cost effects of the high schedule overruns are left for either the contractor or the recipient institution to fill the cost gap amounting to \$14,423.59/month time overrun from their IGRs (Mangvwat, et al., 2018). This indicates a trade-off in the specs and project quality which agrees with Mangvwat et al. (2018) that the practice which allows time to overrun without adequate allowance in the cost element of buildings, and yet expecting to have a building as specified in the design, scope and quality stands the basis of its objectives on its head.

### Conclusion

A general Poor-time performances were observed across the Fund's projects delivery in tertiary education institutions in south-east, Nigeria with a surprising good cost performances as no difference existed between their initial costs and the final construction costs. This is possible because the project costs are rigidly fixed. The Poor-time performances observed can be associated with the fixed price contract regime in the Nigerian turbulent economy without adequate considerations high inflation rate, construction materials price escalation add delayed payments to contractors. To improve the Fund's projects time performance regarding fixed price and materials price escalation, materials' component of the bill should be extracted and paid, in advance, to the contractor for material procurement. This can be made possible by ensuring that contractors launch materials to sites and receiving others into warehouses (where pilfering is anticipated). The other way round is for TETFund to update the award sums with inflation rates prevailing within the period in accordance with the project time schedule.

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