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# THE IMPACT OF MATERIAL MANAGEMENT PRACTICES ON PERFORMANCE OF BUILDING CONSTRUCTION SITES IN SELECTED TERTIARY INSTITUTIONS IN CROSS RIVER STATE, NIGERIA

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***Keywords:*** *Material Management practice, performance, building construction sites, Tertiary institution*

**Abstract:** This work is titled the impact of material management practice on building construction sites in tertiary institutions in Cross River State. The aim of this study is toevaluate the impact of material management practices on building construction sites in selected tertiary Institutions in Cross River State with a view to enhancing effective and efficient management of materials in building construction projects. The objectives are; to identify the causes of ineffective material management process to the construction project delivery; to evaluate the impact of material mismanagement in the building construction sites. The study adopted stratified random sampling techniques, 200 copies of questionnaire were given to respondents drawn from a population of 432. This study adopted survey research design using questionnaire as instrument for data collection and bill of quantities. The findings of the study reveals that the causes of ineffective material management process to the construction project delivery in tertiary institution in cross river state includes; incompetency of the project manager; design error; loss of fiancé; ineffective construction manager; poor planning; lack of pre and post investigation under design and improper supervision; varied labour equipment; lack of legal penalty to offenders and rush work. Finally, the study indicates that cost has a positive relationship with construction delivery in tertiary institutions in Cross River State. Time has a positive relationship with construction delivery in tertiary institutions in Cross River state. Quality has positive relationship with the construction delivery in tertiary institutions in Cross River state. This implies that a unit increase in cost, time and quality will lead to increase in construction delivery in tertiary institutions in Cross River state. The study recommends that each management techniques has its own peculiarity in term of the pretender and post tender activities and processes, division of risks between client and contractors, and the effectiveness of project monitoring and control.

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## INTRODUCTION

Construction material constitutes a major cost component in any construction project. The cost of materials may be 50% to 70% of the total construction cost depending on type of projects (Patil and Pataskar, 2013, Gulghane and Khandve, 2015). Several researchers provided different definitions for material management, therefore different definitions can be found in different references but Kanimozhi and Latha (2014), define materials management as a process for planning, executing and controlling field and office activities in construction. Zeb, Malik, Nauman, Hanif, and Amin (2015) also define material management as a procedure for executing, planning, and controlling site activities in the construction project(s).

According to Ramus and Birchallin Matt Viator (2020), the causes of losses to contractors may arise from any one of the following: inefficient deployment of resources; excessive wastage and theft of materials; plant being allowed to stand idle or under-utilized; adverse weather or working conditions; and under-pricing of tender documents by assumptions in regard to labour times, types and sizes of plant which do not equate with the realities of the construction work. The success of a project is judged by meeting the criteria of cost, time, safety, resource allocation, and quality as determined by the owner (Viator, 2020). The purpose of construction project management is to achieve goals and objectives through the planned expenditure of resources that meet the project's quality, cost, time, scope, and safety requirements**.**

The construction manager must control, deflect, or mitigate the effects of any occurrence or situation that could affect project success. The major tasks in construction management include planning, organizing, scheduling, implementing, managing, monitoring, controlling, and tracking construction projects. It is essential therefore, for construction activities to be accomplished successfully in an effective and efficient way. This requires various strategic and management capabilities such as material management. Material management according to Oyeoku (2011) is defined as a process which involves grouping the business functions relating to the inflow and interplant movement of materials under a head who is in a position to coordinate and correlate individual departmental decisions in a manner which results in the most efficient allocation of organizations resources. Unfortunately, material management in construction process has recently been neglected and this has undoubtedly led to huge amount of material waste while executing construction projects. Obiegbu (2012) lamented that material wastage on construction site has become a canker worm in Nigerian construction industry. This problem according to Obiegbu (2012) has negatively affected the performance of many projects in Nigeria.

In Nigeria, many have expressed concern over poor materials management and its impacts on

the execution of construction projects. Onukwube (2010) lamented that poor material management can result in substantial, but avoidable financial loss during construction. It is pertinent to mention that there are grave consequences that could result from poor materials management, which could result in insufficiency of material for production on site, forcing contractors to produce non-conforming products.

Material management has always been neglected by many construction firms in Nigeria especially the indigenous construction firms (Olatunji and John, 2013). This according to Olatunji and John, (2013) has been a major factor contributing to material waste in the construction sites and poor delivery of projects by the construction firms in the country. It is against this background that Onukwube (2010) earlier advised that construction firms in Nigeria especially the indigenous firms should endeavour to cultivate adequate and holistic material management practices in handling various construction projects so as to ensure their sustainability and subsequently avoid collapse of these projects. To this note, construction firms especially those operating in tertiary institutions in Cross River State are not exempted from the problem.

On the basis of the above, this research is an attempt to explain the impact of material management issues on building projects in Federal College of Education Obudu and Cross River State University of Technology (CRUTECH).

**STATEMENT OF THE PROBLEM**

In Cross River state, there is a huge concern over poor materials management and its impacts on the execution of building construction projects. There is therefore, dire need to improve productivity in our construction industry and at the same time to conserve our foreign exchange now more than ever before. Kontangora in Okeke and Mbabuike (2020) stated that unless the managers in our building construction industry improve on their capabilities in terms of the management of materials, labour and equipment will always have low productivity in the Nigerian construction industry.

It is however fast becoming a norm in construction sites that the allowable waste is far exceeded by the actual waste on construction sites. Theft, vandalism, high interest rates, and improper planning make contractors in the construction industry to fall short of their anticipated profit margins in their projects.

There is no established construction material management system in tertiary institutions in Obudu Cross River State (Okanume, 2021). The materials management practices by the contractors in the institution are performed on a fragmented basis with unstructured communication and no clearly established responsibilities between the parties involved. This fragmentation creates gaps in information flow, which affects the decision making process and lead to delays in material ordering and receiving, among other problems (Thomas and Okanume, 2021).

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Manual materials management and control procedures are unsatisfactory as they are labour intensive, inaccurate, and error prone. The implication leads to waste and surplus of materials, delays, decrease in productivity and lack of up-to-date and real-time information (Navon, 2021).

Considering the construction firms in tertiary institutions in Cross River State, it appears that the managers or perhaps the contractors lack competencies required of contemporary construction firms for effective material management thereby resulting in huge amount of material waste (Viator, 2020). The resultant effect of the poor material management in the construction process by these construction firms leads to poor performance in terms of their service delivery. No research has been conducted to investigate the materials management issues on building project of contracting companies in tertiary institutions in Cross River State. This study has become pertinent to explore the actual situation in these firms for objective remedial actions.

**AIM AND OBJECTIVES**

The aim of this study is to evaluate the impact of material management practices on building construction sites for improving the performance of building projects executed in selected tertiary institutions in Cross River State.

The objectives of the study are:

1. To identify the causes of ineffective material management process to the construction project site in selected tertiary institution in Cross River State.
2. To evaluate the impact of material mismanagement in the building construction sites in selected tertiary institution in Cross River State.

**RESEARCH QUESTION**

The following research questions will guide the study:

1. What are the causes of ineffective material management process to the construction project delivery in selected tertiary institution in Cross River State.
2. What impact does material mismanagement have on building construction sites in selected tertiary institution in Cross River State.

**STATEMENT OF HYPOTHESIS**

**$H_0$:** There is no significant relationship between factors affecting material management and effective building construction project delivery.

**$H_1$:** There is significant relationship between factors affecting material management and effective building construction project delivery.

**LITERATURE REVIEW**

**Concept of Construction Industry**

Construction industry plays an important role in socio economic development of any nation. The activities of the construction industry have a lot of significance to the achievement of national socio-economic development goals of providing infrastructure, sanctuary and employment. This also includes hospitals, schools, townships, offices, houses and other buildings; urban infrastructure (including water

supply, sewerage, drainage); highways, roads, ports, railways, airports; power systems; irrigation and agriculture systems; telecommunications and so on (Kasimu, 2015; Uma and Eboh, 2013). The construction industry holds an immense potential for stimulating growth, boosting project exports and generating employment. The domestic construction segment happens to be one of the fastest growing segments, with an impressive average growth of 7-8 per cent per annum (Ofori, 2010).

The foundation of a higher growth rate rests on a sound and efficient infrastructural development which makes the construction segment a key sector. The rapid expansion of infrastructure by both government and the private sector has triggered off construction activities and fuelled demand in many key sectors like cement, steel, paints and chemicals, glass, timber and earth moving equipment and machinery (Jacobson and Wilson, 2012). The construction sector is a crucial industry having strong backward and forward growth linkages. It deals with all economic activities directed to the creation, renovation, repair or extension of fixed assets in the form of buildings, land improvements of an engineering nature. Besides, the construction industry generates substantial employment and provides a growth impetus to other sectors through backward and forward linkages.

Unlike earlier days, today the construction industry have become highly complex due to the technological developments, globalization, uncertain economic conditions, social pressures, political instability and so on (Walker, 2015). The conventional methods are incapable to meet with the demands of today's environment that is described by the authors as being more dynamic and filled with greater uncertainty (Keith, 2016). With the increasing complexity and uncertainty, project delivery is not only management of three project constraints: cost, scope and time, but perceive it to be an assessment of the uncertainty within which the project is operating and its continuing ability to respond to the reason why it was needed in the first place (Melton and Iles-Smith, 2021). Effective delivery is all about the control and management of uncertainty. Therefore, one needs to identify the uncertainty related to the project and sculpt the best strategy to deliver the project so that the chances of success are increased.

**Concept of Building Construction Project**

The Building construction industry contributes significantly in terms of scale and share in the development process for both developed and developing countries. The construction products provide the necessary public infrastructure and private physical structures for many productive activities such as services, commerce, utilities and other industries. The industry is not only important for its finished product, but it also employs a large number of people (directly and indirectly) and therefore has an effect on the economy of a country/region during the actual construction process (Aluko, 2017).

The National Bureau of Statistics (NBS) put Nigeria's post-re-basing contributions of the construction sector to Gross Domestic Product at N5.7 billion in three years. NBS, in its summary report of 2010, 2011 and 2012 fiscal years on the Construction industry and disclosed that in 2010, the sector contributed N1.570 billion, a value which leaped by 21.30 per cent to reach N1.905 billion in 2011.The industry's contributions closed at N2.188 billion in 2012, bringing the total contribution of the sector to GDP to N5.7 billion and 2017 report shows that the sector recorded a 13 percent growth. Construction activities captured in the report include construction of buildings, roads, railways as well as civil engineering projects (Fagbeni, 2016). Others are construction of utility projects, demolitions as well as site preparations, among others. The NBS added that part of the increased contributions of the sector to the nation's GDP, was its ability to capture all economic activities in the sector (Harman, 2017).

**Concept of Building Material**

Building material are materials used for constructing building. It comprises of sand chippings/ stone, wood, nails, clay, ladder, plywood, doors, reinforcement, cement, sharp sand, blocks, soft sand etc. building and construction are the ore upon which infrastructural development of any nation rest. How much we build is a function of building material available and the quantity of it available. Moreover, the durability and quality of a building also depend on material and its quality. However, the quality and quantity of material used are functions of cost of building materials (Njoku, 2017). Cost of building materials refers to the money cost of each building materials or cost of acquiring the materials and labor cost.

One obvious problem militating against the ability of the building industry in Nigeria from delivering quality and affordable housings and buildings is costs of building materials (Mekson, 2018). People find it difficult building houses because of cost of materials. The problem has become enigma in the building industry. In the past one or two proactive measure has been taken to address the escalating and uncontrollable rise in the cost of building materials. It was for these reasons the Nigeria Building and road research institute (NBRRI) was established in 1978. The institute was mandated to workout alternative source(s) of building materials that will be cost effective and serve as a perfect substitute to the escalating cost of building materials (Saba, 2018). It is important to note that NBRRI mandate was on how to develop quality and suitable building materials using mineral deposits and agro-industrial waste found in Nigeria at little or no cost.

**Concept of Building Material Management**

When managing construction waste, it is important that practices reflect the waste hierarchy with waste prevention and minimization being the top priority followed by reuse and recycling. The primary aim is to

prevent waste generation in the first place which minimizes the resources required to complete the job. Preventing waste is financially advantageous because it reduces the amount of materials being purchased and removes the need to transport waste off site. Waste prevention should be considered throughout all stages of the project especially during the design stage (Vaidya, 2009). This stage of the project offers the biggest opportunity to reduce waste by prioritizing waste prevention from the beginning of the project. During the construction phase, waste prevention can be carried out by ensuring that large volumes of materials are not delivered to site and through the use of a just-in-time delivery system. On the site waste can be minimized by careful storage, handling and the setting up of a central cutting station for some trades.

Trigunarsyah, Sofyan & Hendi (2006) identifies the three R's in construction waste management as follows: reuse, involving salvaging construction waste for other uses, recycling, involving transforming waste into new products and reincorporating them into the construction process and reduction, which involves preventing or minimizing the generation of waste in the first place. (a) Reduce the first and most important step in cutting the amount of waste is reducing the quantity that is actually produced in the first place. There are a number of ways in which waste can „designed out" just by reviewing how works are designed and installed. By planning work properly at the outset of a project, the amount of materials that end up as waste at the end of it can be greatly reduced (NSCC, 2008). (b) Reuse In today's industry, it is simply no longer justifiable to throw away perfectly good materials. As part of managing waste, builders should consider how to make use of common surplus materials arising from projects such as bricks and timber off-cuts either on the same site or at other sites. Where this is not possible, they should liaise with their suppliers about returning the materials to them.

## THEORETICAL FRAMEWORK

### Construction Management theory:

Theory of construction management (2012), proposed a theory of construction management which identifies the actions which help construction projects and companies to be efficient. It takes on the challenge of creating a precise, tightly defined model of construction management (CM), using five clearly differentiated methods for the delivery of building and construction projects. It is an ambitious and intellectually bold attempt to introduce new thinking into the field. What they don't do is draw on any of the many theories of management or production available. On one hand this seems to be an extreme case of exceptionalism - that construction is different from all other industries - school of thought. In their defense, on the other hand, Radosavljevic and Bennett (2002) argue that construction is different, because it is complex: projects have a number of interacting teams where outcomes in the future depend on the number of involved

teams, the quality of relationships between interacting teams and their performance variability. In addition there is also unpredictable interference which may arise from numerous external factors.

In theory of CM the authors aims are to provide a "rigorous theory" based on a "tool kit of concepts and relationships" that will improve the efficiency and quality of "construction products". The distinction between the conventional approach of CM, where contractors deliver projects, and the idea of companies producing a product is an important element in the thinking behind the theory proposed here. A related aim of the book is therefore to raise the viewpoint of CM from projects to the companies that manage projects. Following that intention they "identify and define the concepts needed to understand CM".

**Research Design**

The descriptive survey research design was used for the study. Nworgu (2015) defined the descriptive survey research design as one in which a group of people or items is studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group. This design was considered appropriate for this study because the study seeks opinions of the construction professionals on the material management and its possible influence on the performance of building construction companies in selected tertiary institutions in Cross River State.

**Table 4.1 Population Distribution of the Classes of the Respondents**

| S/N | PROFESSIONALS | CONTRACTORS | CONSULTANTS | POPULATION (CONTRACTOR) (CONSULTANTS) |
|---|---|---|---|---|
| 1 | CIVIL ENGRS | 60 | 50 | 110 |
| 2 | MECHANICAL ENGR | 5 | 8 | 13 |
| 3 | ELECTRICAL ENGRS | 4 | 6 | 10 |
| 4 | ARCHITECTS | 87 | 120 | 207 |
| 5 | QUANTITY SURVRS | 25 | 19 | 44 |
| 6 | PROJECT MANAGER | | 20 | 20 |
| 7 | BUILDER | 13 | | 13 |
| 7 | SITE MANAGERS | 10 | | 10 |
| 8 | LAND SURVEYORS | 5 | | 5 |
| | TOTAL | | | 432 |

***Source: Field Survey, 2022***

**Model Specification**

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According to Jhingan, (1997) an economic model is an organized set of relationship that describes the functioning of an economic identity under a set of assumptions from which the conclusion or set of conclusions is logically derived.

The specification of the econometrics model is usually based on economic theory and on any available information relating to the phenomenon being studied (Koutsoyiannis, 1977)

This study shall build a multiple regression model and make use of econometrics procedure in estimating the relationship between my economic variables.

The functional form of the model is specified as follows.

PBCP = *f* (DMM, CMM).....3.1

The econometric form of the model is as follows

$PBCP_t = \beta_o + \beta_1 DMM_t + \beta_2 CMM_t + \mu$.....3.2

Where,

PBCP= real gross domestic product i.e. (constant price GDP)

*f* = functional relationship

DMM = Design mismanagement

CMM = Contractual material mismanagement

$\beta_o$= Constant term

$\beta_1, \beta_2, \beta_3$ and $\beta_4$ = parameter coefficients

$\mu$= Error term

t = Time period

***Presentation of Data***

Data on questionnaire response as well as socio-economic characteristic of respondents were presented in this section.

***Base Data of respondents***

| Group | Population | Sample Size | Questionnaire distributed | Questionnaire Returned | Questionnaire not returned | Percentage of Questionnaire Returned |
|---|---|---|---|---|---|---|
| **Selected Tertiary institution in Cross River** | **432** | **208** | **208** | **200** | **8** | **96.15%** |

The above table shows that a total of 208 copies of questionnaire were administered. A total of 200 were completely field and returned while 8 questionnaires were not returned by the respondents.

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**Analyses of the First Objective**

***To identify the cause of ineffective material management process to the construction project delivery in Tertiary Institution in Cross River State?***

| S/N | **Causes of ineffective material management process to the construction project delivery** | W | SA---------- SD 4 | 3 | 2 | 1 | ∑FX | $\bar{X}$ | DECISION |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Incompetence of the project manager | F<br>WF | 90<br>360 | 80<br>240 | 20<br>40 | 10<br>10 | 200<br>650 | 3.25 | ACCEPT |
| 2 | Design error | F<br>WF | 88<br>352 | 78<br>234 | 22<br>44 | 12<br>12 | 200<br>642 | 3.21 | ACCEPT |
| 3 | Loss of finance | F<br>WF | 86<br>344 | 76<br>228 | 20<br>40 | 18<br>18 | 200<br>630 | 3.15 | ACCEPT |
| 4 | Inefficient construction management | F<br>WF | 84<br>336 | 74<br>222 | 22<br>44 | 20<br>20 | 200<br>622 | 3.11 | ACCEPT |
| 5 | Poor planning | F<br>WF | 82<br>328 | 72<br>216 | 20<br>40 | 26<br>26 | 200<br>610 | 3.05 | ACCEPT |
| 6 | Lack of pre and post investigation, under design and improper supervision | F<br>WF | 80<br>320 | 70<br>210 | 22<br>44 | 28<br>28 | 200<br>602 | 3.01 | ACCEPT |
| 7 | Lack of pre and post investigation, under design and improper supervision | F<br>WF | 78<br>312 | 68<br>204 | 22<br>44 | 32<br>32 | 200<br>592 | 2.96 | ACCEPT |
| 8 | Varied labour equipment | F<br>WF | 76<br>304 | 66<br>198 | 20<br>40 | 38<br>38 | 200<br>580 | 2.90 | ACCEPT |
| 9 | Lack of legal penalty to offenders | F<br>WF | 74<br>296 | 64<br>192 | 22<br>44 | 40<br>40 | 200<br>572 | 2.86 | ACCEPT |
| 10 | Rush Work | F<br>WF | 72<br>288 | 62<br>186 | 20<br>40 | 46<br>46 | 200<br>560 | 2.8 | ACCEPT |
| | Grand Total | | | | | | | 3.10 | ACCEPT |

The table above shows the opinion of the respondents on the causes of ineffective material management process to the construction project delivery in tertiary institution in cross river state includes; incompetency of the project manager; design error; loss of fiancé; ineffective construction manager; poor planning; lack of pre and post investigation under design and improper supervision; varied labour equipment; lack of legal penalty to offenders and rush work. This goes with a mean index value of 3.25; 3.21; 3.15; 3.11; 3.05; 3.01; 2.96; 2.90; 2.86 and 2.80 respectively. Based on the result, the researcher firmly concludes that the identified items are the causes of ineffective material management process to the construction project delivery in tertiary institution in Cross River state.

**Analyses of the Second Objective**

***To evaluate the impact of material mismanagement in the building construction sites in tertiary institution in Cross-River state.***

***Regression Techniques***

Dependent Variable: BCS
Method: Least Squares
Date: 04/26/22 Time: 19:50
Sample (adjusted): 2015 2021
Included observations: 6 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 1.753414 | 1.404414 | 1.248183 | 0.2219 |
| COST | 9.452312 | 7.581012 | 2.247616 | 0.0222 |
| TIME | 2.257610 | 6.893709 | 3.270861 | 0.0028 |
| QUALITY | 4.230011 | 2.023312 | 2.209519 | 0.0355 |

| | | | |
|---|---|---|---|
| R-squared | 0.658946 | Mean dependent var | 4.51E+13 |
| Adjusted R-squared | 0.647003 | S.D. dependent var | 2.33E+14 |
| S.E. of regression | 1.88E+14 | Akaike info criterion | 68.74923 |
| Sum squared resid | 1.03E+30 | Schwarz criterion | 69.05713 |
| Log likelihood | -1230.486 | Hannan-Quinn criter. | 68.85670 |
| F-statistic | 4.099840 | Durbin-Watson stat | 1.455343 |
| Prob(F-statistic) | 0.004245 | | |

***Source: Eviews Computations 2023***

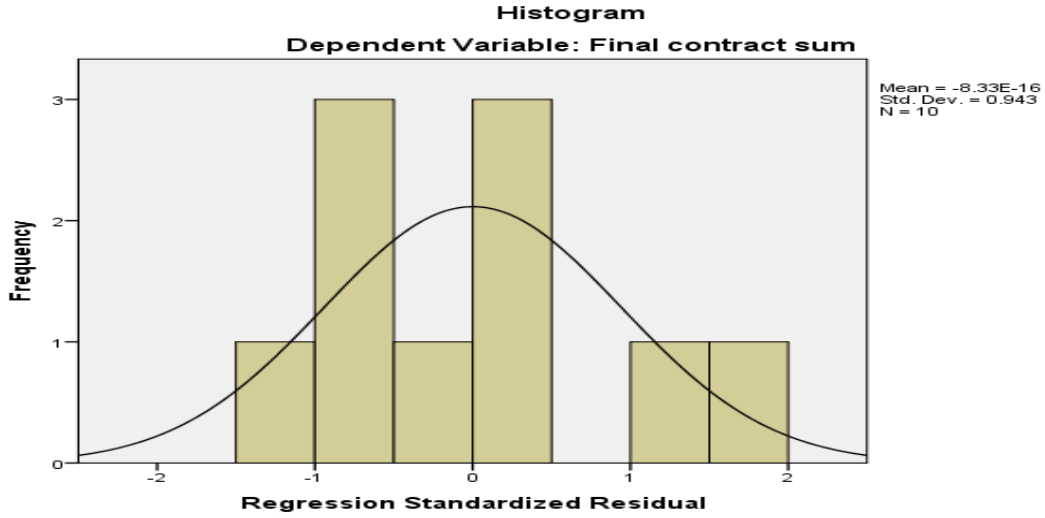
The signs of some of the variable coefficient from the estimated model are totally in line with a priori expectations. Cost has a positive relationship with construction delivery in tertiary institutions in Cross River State. Time has a positive relationship with construction delivery in tertiary institutions in Cross River State. Quality has positive relationship with the construction delivery in tertiary institutions in Cross River State. This implies that a unit increase in cost, time and quality will lead to increase in construction delivery in tertiary institutions in Cross-River State.

The constant term is estimated at 1.753414 which mean that the model passes through the point 1.753414 mechanically, if the independent variables are zero, construction delivery would be 1.753414 (Gujarati and Sangeetha, 2007).

The estimated coefficient for Cost is 9.452312, this implies that if we hold all other variables affecting construction delivery constant, a unit increase in cost will lead to a 9.452312 increase in construction delivery on the average. Likewise, the estimated coefficient of time is 2.257610 which imply that a unit increase in time will lead to a 2.257610 increase in construction delivery on the average. More so, from the result, the estimated coefficient for quality is 4.230011 which implies that unit increase in quality will lead to 4.230011 increase in construction delivery on the average.

The coefficient of determination $R^2$ from the regression result, the $R^2$ is given as 0.658946 this implies that 65.8946% of the variation in construction delivery is being explained by the variation in cost, time and quality on the average.

**Histogram Plot showing how the residual are normal distributed around the mean value**



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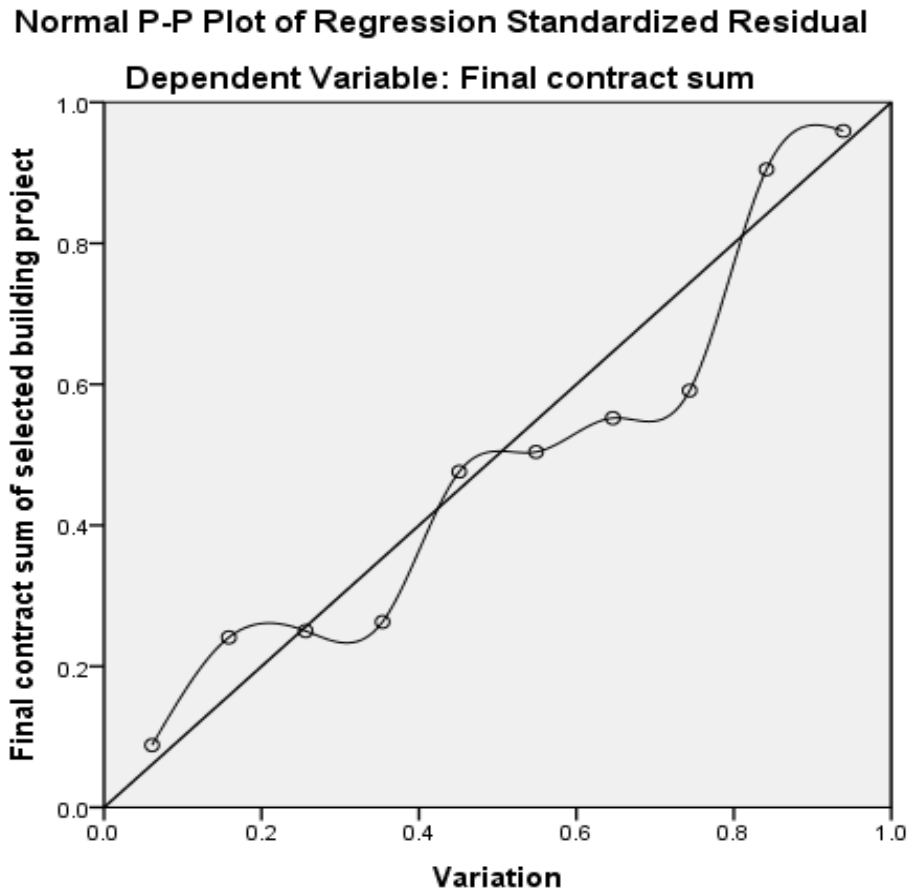
From the result of the histogram plot which shows how the residuals are evenly spread around the mean value. The table shows that the mean value of the residual is -8.33E-16; the standard deviation is 0.943 and the total number of the observed projects are 10. From the histogram plot, we can firmly believe that the residuals are evenly spread around the mean value of -8.33E-16.

**Plot 5.2 Normality P-P Plot of regression standardized residual**




The normal P-P plot of the regression standardize residual is confirmation of the normality of the residual as rightly indicated by the histogram plot. As we can see from the plot, the series of the residuals are fluctuating around the residual mean value which shows that the output the of the regression output is a true representation of the reality. More so, it shows that the estimated parameters can be used for future making future forecast.

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**TEST OF HYPOTHESES**

**Hypotheses One**

**$H_0$:** There is no significant relationship between factors affecting material management and effective building construction project delivery

**One-Sample Test**

| | Test Value = 0 | | | | | |
|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | |
| Null Hypothesis | T | Df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| There is no significant relationship between factors affecting material management and effective building construction project delivery. | 0.013 | 200 | .041 | 0.00130 | 0.12 | 0.34 |

***Source: SPSS Computation 2021***

From the test of hypothesis above using one sample test t-statistics, based on the decision rule, accept null hypothesis if the value of the t-statistics is greater than 0.05, from the result; the value of the t-statistics (0.013) is less than 0.05 hence we reject the null hypothesis and conclude that there is no significant relationship between factors affecting material management and effective building construction project delivery.

**Conclusion**

From the findings of the study, the research concludes that there is a contractual practice of material management in the building construction sites in tertiary institutions in Cross River State. Also the researcher concludes that the causes of ineffective material management process to the construction project delivery in tertiary institution in cross river state includes; incompetency of the project manager; design error; loss of fiancé and several others. Finally, the study concludes that Cost has a positive relationship with construction delivery in tertiary institutions in Cross River State. Time has a positive relationship with construction delivery in tertiary institutions in

Cross River state. Quality has positive relationship with the construction delivery in tertiary institutions in Cross River State. This implies that a unit increase in cost, time and quality will lead to increase in construction delivery in tertiary institutions in Cross River State.

**Recommendations.**

Based on the findings of the study the researcher recommends

- It is very important at the very outset of the project to carefully consider all factors when selecting the most appropriate management techniques for a construction project. This is because each system has its own feature and peculiarity that will have effect on the cost, time and quality of the project i.e. the project performance.
- Each management techniques has its own peculiarity in term of the pretender and post tender activities and processes, division of risks between client and contractors, and the effectiveness of project monitoring and control.

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