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Material Management Practices and Employee Efficiency of Construction Firms in Anambra State, Nigeria

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ABSTRACT: The study examined the material management practices and employee efficiency of construction firms in Anambra State. The researcher developed two specific objectives which were to: determine the extent to which procurement affects employee productivity in construction firms in Anambra State; evaluate the extent to which logistics affects employee efficiency in construction firms in Anambra State. This study was anchored on Inventory Management Theory. Data were generated through primary and secondary sources. The method for data collection was the questionnaire which was administered randomly among the staff of the construction firms. The population of the study was three thousand five hundred and ninety-two (3592). The sample size of the study was six hundred and ninety (690) through Borg & Gall (1973) formular. Five hundred and eighty-seven (587) copies of questionnaire were retrieved. The hypotheses were tested using multiple regression analysis method at 0.05% level of significance. Findings from the study revealed that Procurement had significant effect on employee productivity in construction firms in Anambra State.. (t=4.694, p, 000); Logistics had significant effect on employee productivity in construction firms in Anambra State., Nigeria (t=3.624, p, 000); The study recommended that Management should adopt the use of information technology, that will not only help in information sharing, but also will help in proper procurement procedure of material from suppliers hence improving the material usage.

KEYWORDS: Material management practices, employee efficiency, construction firms, procurement, logistics

1. INTRODUCTION

In the current exceedingly aggressive commercial environment, the weight on firms to discover better approaches to convey value to their clients is becoming ever challenging. The expanding requirement for industry to offer items in a worldwide market based on cost and quality has generated the need to implement more productive warehousing approach (Ajike, Chukwujama, Nkwonta, Ejike, & Nwankwo, 2024). Materials management has come to be perceived as an unmistakable crucial process with the operation of large-scale Construction firms. Material management comes before processing of material held for construction work (Coyle, Bardi, & Langely 2021). Material management appears to be essential hubs in a supply chain network because it

performs an important function that help in the development of Materials, management items, dismissing vehicle loads, making stock keeping unit combinations and gathering Material for shipments purposes (Langevin & Riopel 2022).

No organization can operate without Materials input. The efficiency of any activity for production of goods and services depends to a great extent, on the supply of Materials, equipment and manpower made available in their right proportions (Ifechukwu-Jacobs, & Atueyi 2024). Material management is that aspect of business activity that deals with planning for purchasing, receiving, handling, storing, and releasing of Materials for use in production with effective control measure (Oniwon, 2020). Every organization makes significant financial investments in Materials. The cost of Materials often exceeds 50% of the overall cost of items produced. Such a huge investment necessitates extensive planning and monitoring in order to minimize waste, which invariably has an impact on any organization's performance and profitability as a whole (JerutoKeitany & Richu, 2014; Ogunewe, Ananwude & Nduka, (2020). The performance of an organization can be measured through various factors and the most common performance indicators for every type of business organizations are productivity, profitability, quality of product (service) and growth and customer satisfaction (Abdela, Ahmed, Sema., Adamu & Yasin, 2023; Nduka, Okolie & Ngangah, 2025).

Companies engaging in efficient Materials management are most probable to perform better than those that do not and realize significant savings in total costs of production, hence, effective Materials management can result to cost reduction, savings and overall productivity (Davis, 2019). Materials management is a tool to optimize performance in meeting customer service requirements at the same time adding to profitability by minimizing costs and making the best use of available resources. The basic objective of Materials management as explained by Banjoko (2017); Jacobs, Chase & Aquilano (2019); and Okeke, (2025) is to ensure that the right item is bought and made available to the manufacturing operations at the right time, at the right place and at the lowest possible cost. They stressed that without adequate planning for Materials resources, the overall performance of an organization may be crippled.

Objectives of the Study

The broad objective of this study is to determine the effect of Materials management on organizational productivity of construction firms in Anambra State, Nigeria. This study specifically identified the following objectives:

i. To determine the extent to which procurement affects employee efficiency in construction firms in Anambra State, Nigeria

ii. To evaluate the extent to which logistics affects employee efficiency in construction firms in Anambra State, Nigeria.

2. LITERATURE REVIEW

Materials Management

Ajayi, Agorzie and Monday (2017) defined construction Materials management as a reduction in the amount and environmental effect of Materials waste generated, by reducing the amount of Materials consumed in a project. Muleya and Kamalondo (2017) also identify Materials management as an integrated process of designing, constructing new structures or re-modeling existing structures, using materials more efficiently with a great importance of contributing to construction industry's performance improvement as well as solving Materials waste management problems. When we talk

about Materials it may include raw Materials, components; sub-assemblies etc. now let us see the different definitions of Materials management. Materials management is a process that starts with the supplier (Bially 2015; Aniefor, Nduka, Ananwude & Ezeaku, 2021). The Materials management process begins from the point of entry into the company as raw Materials and components. The receipt and section functions begin on receipts of delivery notice from the supplier (Heinritz, 2011; Unukpo, Nwankwo, Chendo & Okeke, 2025).

Procurement

According to Mead and Gruneberg (2013), procurement is a crucial first step in the delivery process and involves more than just selecting vendors and creating contracts. The procurement process encompasses a variety of activities, such as the acquisition of tools, supplies, labor, and services needed for project development and execution (Putra et al., 2021; Okeke & Ahaiwe, 2024). Procurement is defined by Odeleye (2020) as determining and assessing the needs of the user and the type of purchase, choosing suppliers, negotiating contracts, serving as a liaison between the user and the supplier, and assessing and forming strategic partnerships with suppliers.

Logistics

Logistics is a movement-focused concept that includes organizing, carrying out, and managing the flow and storage of all products—from raw materials to the final product—in order to satisfy client demands (Anifowose et al., 2022; Olaleye et al, 2021; Anusi & Nduka, 2022). Construction raw materials are typically heavy, big, and variable, and they must be handled carefully during the delivery process. According to Jahani et al., (2021), the construction industry necessitates the active transportation of materials from suppliers to the production area in both the factory and the worksite.

Efficiency

Efficiency comprises the actual output or results of an organization as measured against its intended outputs (or goals and objectives).According to Richard *et al.* (2019), organizational efficiency three specific areas of firm outcomes: financial performance (profits, return on assets, return on investment, etc.); product market performance (sales, market share, etc.); and shareholder return (total shareholder return, economic value added, etc). Organizational efficiency is the ultimate dependent variable of interest for researchers concerned with just about any area of management (Devinney *et al.,* 2010; Eze, Nwakwo & Okeke, 2025; Nduka, Ananwude & Osakwe, 2019). This broad construct is essential in allowing researchers and managers to evaluate firms over time and compare them to rivals. In short organizational efficiency is the most important criterion in evaluating organizations, their actions, and environments. Ekwunife, Nduka & Ogini, 2022)

2.2 Theoretical Framework

Inventory Management Theory

This study is anchored on Inventory Management Theory which was propounded by Nowicka-Skowron (2007). It emphasizes the role that management of logistics chains plays in Materials management and forecasting. The theory posits that the chain of movement of Materials and information depends to a large extent on the availability of Materials and the quality of information at the disposal of the chain operator. Materials theory (or more formally the mathematical theory of inventory and production) is the sub-specialty within operations research and

operations management that is concerned with the design of production/inventory systems to minimize costs: it studies the decisions faced by firms and the military in connection with manufacturing, warehousing, supply chains, spare part allocation and so on and provides the mathematical foundation for logistics. The inventory control problem is the problem faced by a firm that must decide how much to order in each time period to meet demand for its products. The problem can be modeled using mathematical techniques of optimal control dynamic programming and network optimization.

The purpose of inventory theory is to determine rules that Materials management can use to minimize the costs associated with maintaining Materials management and meeting customer demand. Okeke, (2024) posit that inventory Materials management is studied in order to help companies save large amounts of money. Inventory Materials management models answer the questions: When should an order be placed for a product? .How large should each order be? The answers to these questions are collectively called Materials management. Companies save money by formulating mathematical models describing the inventory system and then proceeding to derive an optimal Materials management policy. It provides the framework for optimizing inventory levels, reducing costs, and improving customer satisfaction. Effective inventory management is crucial for maintaining a healthy cash flow, meeting customer demand, and minimizing waste.

2.3 Empirical Review

Kayiranga, Nyamweya and Shukla (2020) examined the contribution of Materials management practices on performance of construction of project. Specifically, the present research assessed the effects of Materials estimation costs on project performance, the effect of procurement on performance of construction project and examined the effect of inventory control on performance of construction projects. Both descriptive and correlational research designs were adopted where qualitative and quantitative approaches were applied. Data collection instruments that used were questionnaire, interview guide and documentary analysis. The target population was 200 contractors and 180 subcontractors. The sample size was 195 respondents, the statistical tools employed in this study was multiple regression analysis. Furthermore, objective was analyzed using Statistical Package for Social Sciences version 21.0. Results evidenced a positive and significant correlation between Materials estimation cost and performance of construction project at Baraka Properties was 0.518. A positive and significant correlation of 0.884 was also obtained between procurement process and project performance. The results also indicated that the coefficient correlation between procurement process inventory control and project performance was 0.874.

Egwuatu, (2020) investigated the effect of Materials management and organizational productivity in brewering industry in South-East in Nigeria. The study aims to examine the effect of Materials control and organizational productivity of brewer industry and to examine the relationship between Materials planning strategy and organizational productivity of brewer industry South-East in Nigeria. Relevant conceptual theoretical and empirical literature was reviewed. The study was anchored on Inventory Management Theory. Descriptive survey research design was adopted. The study was carried out in South-East, Nigeria. The population of the study was 2451, while the sample size was 328. The instrument used for the study was questionnaire. Face and content validity was

adopted while, test re-test and Cronbach Alpha method were carried out to achieve reliability of the instrument. Simple percentage analysis was employed to answer the research questions and Multiple Regression analysis was used in testing the hypotheses. Results showed that Materials control has a significant positive influence on organizational productivity in Nigeria brewer industries South-East.

Ifechukwu-Jacobs, Arinze, & Nwangwu, & Atueyi, (2025) The study analyzed the financial literacy and its impact on youth entrepreneurship in South East Nigeria. The objective of the study was to; ascertain the effect of financial knowledge, financial behaviour and financial expertise on youth entrepreneurship in South East Nigeria. Three research hypotheses are formulated in line with the above objectives of the study. Descriptive survey design method was used; Structured questionnaire were use to gather information from the population. The population of the study is made of youths from age 20-39 in South East zone of Nigeria, which is 50,222,32 target population. It comprises of all the youths in South East Nigeria, while the sample size is 399 were gotten through taro yamane formular. The researcher distributes three hundred and ninety-nine (399) questionnaires but only three hundred and seventy-three (373) copies of questionnaire were retrieved. Correlation and t-test method of data analysis was used to test the hypotheses. The finding of the study shows that; Financial knowledge has significant positive effect on youth entrepreneurship in South East Nigeria. Financial behaviour has significant positive effect on youth entrepreneurship in South East Nigeria.

Nwangwu, Ohanyere, Nwangwu, & Atueyi, (2025) examined the effect of artificial intelligent (AI) on decision-making in supply chain management of lubricant firms in Anambra state, Nigeria. The study was anchored on Technology Acceptance Theory (TAT). A structure questionnaire was developed for data collection. The population of the study comprised of 281 management staff from thirteen (13) lubricant firms in Anambra State. Two hundred and sixty-nine (269) were duly filled and returned data was analysed using correlation analysis with the aid of statistical package for social science (SPSS) version 23. Findings from the study show that. Machine learning has significant effect on decision support system on supply chain management of lubricant firms in Anambra state (T=2.244, P=0.006). Neural networks has significant effect on creative decision skill on supply chain management of lubricant firms in Anambra state (T=9.790, P=0.009). The study concludes that AI-powered predictive analytics improved decision-making in supply chain management in lubricant firms in Anambra state, Nigerian..

Ohanyere, Arinze, & Atueyi (2025) Investigated the digital cyberspace cost on firm performance of deposit money bank using data for the period of 2012-2023. Panel least squared (PLS) method of data analysis was adopted because of its Best Linear Unbiased Estimators (BLUE) properties. The data for the variables used was sourced from annual report of the selected deposit money bank in Nigeria. The variables were on cyber security maintenance cost and cyber security acquisition cost. The study adopted the descriptive statistics, correlation approach, as well as panel least square. E- View software was used for the analysis. The study found that Cyber security maintenance cost has significant effect on performance of deposit money bank in Nigeria. (t-test 3.491757, p=0.0008). Cyber security acquisition cost has no significant effect on performance of deposit money bank in Nigeria. (t-test 0.959399, p=0.3405).

Ifechukwu-jacobs, & Atueyi, (2024) Material management and productivity of Nigeria bottling appraised the material management and productivity of Nigerian Bottling Company. The study adopted survey method of research. Data were generated through primary and secondary sources. The method for data collection was questionnaire which was administered randomly among the staff of Nigerian Bottling Company. The population of the study was 288 staff. while two hundred and seventy (270) questionnaires were retrieved. The hypotheses were tested using regression analysis method at 0.05% level of significance. The findings of the study revealed, Planning has a significant effect on productivity in Bottling Companies in Onitsha given its F-value of 14.027. Material procurement has a significant effect on productivity in Bottling Companies in Onitsha given its F-value of 33.048. Logistic has a significant effect on productivity in Bottling Companies in Onitsha given its F-value of 9.418. Stock and waste control has a significant effect on productivity in Bottling Companies in Onitsha.

Onya, Arinze, & Atueyi, (2025) examined job satisfaction and employee's performance among the staff of private universities in Anambra state. The study investigated the relationship between reward, career development, staff training and recognition on employee performance. Relevant theoretical and empirical literatures were reviewed. The study was anchored on Herberg's throry. The study collected data from primary and secondary sources. The population of the study comprised 478 staff of private universities in Anambra state. Formulated hypothesis were tested, using ANOVA. From the analysis, it was discovered that: Reward has significant effect on employee's performance amongst the staff of private universities in Anambra state**.** Career advancement has significant effect on employee's performance, amongst the staff of private universities in Anambra state. Training has significant effect on employees' performance amongst the staff of private universities in Anambra state.

METHODOLOGY

The design that was adopted in this study was the descriptive survey research design where data concerning Materials management were collected. The data are both quantitative and qualitative, consisting of primary data from the respondents in construction firms. Kombo & Tromp (2016), state that the major purpose of descriptive research is to describe the state of affairs as it exists. The primary source of data that was used in this study was from questionnaire. This is because of the nature of the variables that were used. The population of the study consist of the staff of the following construction firms in Anambra State, Nigeria which is 3592. The sample size approximately was 690 through the use of Borg & Gall (1973) guidelines. Purposive sampling enable the researcher to choose respondents that were of interest to the study while the stratified random sampling permit each of the different respondents in the sample to be selected without bias. The researcher collects primary data from employees of the organizations under study through the use of questionnaire.

RESULT AND DISCUSSION OF FINDINGS

Six hundred and ninety (690) questionnaires were administered among the selected staff of construction firms in Anambra state However; five hundred and ninety-two (592) were retrieved, while five hundred and eighty-seven (587) where found to be good in the analysis. Therefore, the analysis and interpretation of data were only based on the

returned questionnaire. The method used was percentage table technique and t-test for the hypothesis. The method was adopted because it possesses a unique estimating property which includes unbiased, efficiency and consistency when compared with other linear unbiased estimates

Table 4.1: Respondent rate of the collected questionnaire

S/N			Percentage Returned
1	Copies of questionnaire Distributed	879	100
2	Copies of questionnaire Returned	592	95.2
3	Copies of questionnaire Rejected	5	0.80
	Copies of questionnaire used	587	94.3

Source: Field Survey 2025

From the table above, six hundred twenty-two (622) copies of the questionnaire were distributed. Five hundred ninety-two (592), were returned which represent 95.2, while five were rejected because they were not properly filled. Five hundred and eight (587) which represents 94.3% were used in the analysis.

Table 4.2 Demographic Respondent

Table 4.2.1 Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	295	49.7	50.3	50.3
	Female	292	49.2	49.7	100.0
	Total	587	98.8	100.0	

Source: Computed by the researcher

Table 4.2 above reveals that the two hundred and ninety-five (295) of the respondents which represents 50.3% were male respondents, while two hundred and ninety-two (292) respondents which represent 49.7% were female respondents. By implication, male respondents were more than female respondents by 0.6% in our selected population sample for this study. The implication of this is to enable us to know the number of female and male that successfully returned their questionnaire.

Table 4.2.2 Sex Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	298	50.2	50.8	50.8
	Married	160	26.9	27.3	78.0
	others	129	21.7	22.0	100.0
	Total	587	98.8	100.0	

Source: Computed by the researcher

In the table 4.2.2 above, out of the five hundred and eighty-seven (587) respondents, two hundred and ninety-eighty (298) of the respondents were single, while one hundred and sixty (160) respondents which represent 27,3 percent are married. However, one hundred and twenty-nine (129) were others. It is therefore glaring that the majority of the respondents are single as at the time of this study. Thus marital status table help us to know the number of single, and married, and respondents that answered the distributed questionnaire

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Table 4.2.3 Sex Work experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5yrs	110	18.5	18.7	18.7
	6-10yrs	176	29.6	30.0	48.7
	11-15yr	201	33.8	34.2	83.0
	over 16yrs	100	16.8	17.0	100.0
	Total	587	98.8	100.0	

Source: Computed by the researcher

Table 4.2.5 above shows that respondents who have been engage in work experience. for a period of 1-5 years, one hundred and ten (110) which represents 18.7%. This is followed by those in service between 6-10 years with one hundred and seventy-six (176) which represents 30.0%. Again, those that fall in service gap between 11-15 years with two hundred and one (201) which represents 34.2%. Lastly, This is followed by those in service between over 16 years with one hundred (100) which represents 17%. The implication of years in-service is to enables us have a clear view of those who have been in service for a particular period of time.

Table 4.2.4 Sex Educational qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SSCE	151	25.4	25.7	25.7
	HND/BSC	382	64.3	65.1	90.8
	MSC/MBA	50	8.4	8.5	99.3
	OTHERS	4	.7	.7	100.0
	Total	587	98.8	100.0	

Source: Computed by the researcher

The table above indicated that one hundred and fifty-one (151) respondents which representing 25.7% maintain to acquire have acquired SSCE, while 65.1% of the respondents which represents three hundred and eighty-two (382) acquired HND/MBA. However fifty (50) which represent 7 percent either have MSC/MBA. The respondents that have others are numbered four (4) which represent 7%. This is one of the demographic item which helped us to identify the education qualification of the respondent.

Table 4.2.5 Sex Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-30	72	12.1	12.3	12.3
	31-40	169	28.5	28.8	41.1
	41-50	246	41.4	41.9	83.0
	Above 50	100	16.8	17.0	100.0
	Total	587	98.8	100.0	

Source: Computed by the researcher

Table 4.2.4 above depicts the age bracket of the respondents. The distribution shows that 12.3% of the respondents are between the age brackets of 21 to 30 years while 28.8% respondents are within the age bracket of 31-40 years. On the same note, 41.9% of the respondents are within the age bracket of 41 - 50 years. Moreso, 17.0% of the respondents are within the age bracket of 50 and above.

4.3 Multiple Regression Analysis

Multiple regression result was employed to test the effect of independent or explanatory variables on the dependent variables. The result of the multiple regression analysis is presented in the tables below.

Table 4.3.1 Summary of the Regression Result

The result of the multiple regressions is presented in the tables below:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.746[a]	.556	.552	.65160	.556	121.191	6	580	.000	1.792

a. Predictors: (Constant), PRO, LOG,

b. Dependent Variable: EME

Table 4.3.1 shows that R^2 co-efficient of determination which measures the strength of the effect of independent variables on the dependent variable has the value of 0.55. This implies that 55% of the variation in material management on employee efficiency is explained by variations in procurement, and logistics. This was supported by adjusted R^2

of 0.55%. Test for autocorrelation: This is used to test whether errors corresponding to different observations are uncorrelated. If the value of the durbin-watson from the regression result is close to 2 no autocorrelation in that regression result, but if it deviates significantly then there is autocorrelation. The Durbin-Watson statistic (D.W) of 2 reveals no autocorrelation in the model. Hence, the result is good for business analysis because the Durbin Watson result is 1.792 which indicates that the study is free from the problems of autocorrelation.

Table 4.3.2 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	308.738	6	51.456	121.191	.000[b]
	Residual	246.261	580	.425		
	Total	554.998	586			

a. Dependent Variable: EME
b. Predictors: (Constant), PRO, LOG,

The f-statistics value of 121.191 in table 4.3.2 with f-statistics probability of 0.000 shows that the independent variables have significant effect on dependent variable such as procurement and, logistics, can collectively explain the variations in material management variables on employee efficiency.

Table 4.3.3. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	0.449	.219		4.321	.000	.559	.449
	PRO	.254	.054	.265	4.694	.000	.148	.361
	LOG	.332	.092	.350	3.624	.000	.512	.152

a. Dependent Variable: EME

A'priori Criteria: This is determined by the existing business theories; it also indicates the signs and magnitude of the business parameter under review. In table 4.3.3 above, we found out that procurement has a positive sign given its value as 0.25; this implies that a unit increase in procurement increases the employee efficiency by 25%, this conform to the a' priori expectation. Logistics has a positive sign given its value as .0332; this implies that a unit increase in Logistics

increases the employee efficiency by 33%, this conform to the a' priori expectation.

T- Statistics: The t-test is used to measure the individual statistical significance of the explanatory parameters in the model. From table Coefficients above procurement is 4.694, this is statistically significant, this suggest that it contribute significantly to employee efficiency**.** Logistics is 3.624 this is statistically significant, this suggest that it contribute significantly to employee efficiency at 5% level of significant**.**

5. CONCLUSION

This research found out that there is a significant relationship between material management and the employee output. This can be expected since the existence of material management result in the firm improvement. This research has shown how profitability can be achieved via effective management of materials with particular attention to sourcing, receiving, storing and issuing materials. The general conclusion of this study is that material management practices improve the overall in handling of materials for more efficiency and effectiveness on the construction site. This is because poor handling of construction materials affects the overall performance of construction projects in terms of cost, time, quality and productivity. Material management practices improve the success rate of project planning and execution thus lowering the project cost. More so, the minimization of materials wastage during the construction phases is important in order to avoid loss of profits. The study makes the following recommendations:

i. Management should adopt the use of information technology that will not only help in information sharing, but also will help in proper procurement procedure of material from suppliers hence improving the material usage

ii. Construction companies operating in Anambra state should prioritize in investing on modern day Systems of logistics that will enhance efficiency and effectiveness production..

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