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Just-In-Time Inventory Management Practice and Performance of Selected Polytechnics in Southwest, Nigeria: Implications for Sustainable Stock Efficiency

Olaniyi M. GBADAMOSI[1]
Peter O. ALASE[2]
Segun B. ILUGBUSI[2]

Abstract

This study examined Just-in-Time (JIT) inventory management practice and performance of selected polytechnics in Southwest Nigeria, and the implications for sustaining stock efficiency. The study used descriptive survey research design and a total of one thousand and thirty-six (1,036) store employees from federal, state and private polytechnics in the Southwest, Nigeria. A sample size of five hundred and forty-four (544) determined through multi-stage and stratified sampling technique was used for data analysis. Primary data were obtained through questionnaire while linear regression was employed to determine the effects and statistical significance of the relationships between the study variables. The Statistical Package for Social Sciences (SPSS) version 24.0 was applied to process the data and the hypothesis was tested at p-value of = 0.05 level of significance while descriptive statistical analysis was used to identify frequencies and percentages. The findings of the study showed that JIT inventory management practice cannot be underestimated in determining performance of polytechnics in Southwest Nigeria. The study recommended that management of polytechnics in Southwest Nigeria should develop a policy framework to facilitate faster implementation of the best inventory management practices such as JIT as it has proven to have significant positive effect on employees' performance.

Keywords: Just-in-Time, Inventory, Inventory Management, Employees' Performance.

[1] Department of Procurement and Supply Chain Management, The Federal Polytechnic, Ado-Ekiti, Nigeria.
Corresponding author's e-mail: fpagbadamosi@gmail.com

[2] Department of Management and Entrepreneurial Studies, College of Social and Management Sciences, Afe Babalola University, Ado-Ekiti, Nigeria.

Introduction

Inventory management practices by public and private organizations across the world can be seen as important factor that underscore attainment of their performance targets. Inventory management practice is vital to achieve organizational performance because it ensures that assets and stocks are adequately managed and that precise demand forecasting is maintained to minimize unexpected procurement operations. This will help the public and private organisations execute effective procurement procedures that meet market demand and supplier factors for performance enhancement (Brigham & Gapenski, 2018).

However, inventory management is mostly afforded by large organizations due to large capital investment and use of sophisticated technology. Regardless of level of sophistication of control system, it is argued that inventory has to be properly managed in order to maximize storage costs and to boost up inventory to the level of customers' demand in the target market to achieve optimal performance (Atnafu & Balda, 2018; Medard, 2018). One of the plausible ways to achieve this is to avoid placing a lot of capital in inventory. It thus implies that the chain supply inventory personnel need to have competence in procurement process as deficiency in procurement skills could plunge the performance of institutions into total chaos (Medard, 2018).

As a rule of thumb in most organizations, direct materials represent up to 50% of the total product cost, as a result of the money invested on inventory, improper inventory management system can affect profitability and competitiveness of the organization. According to Sander, Matthias and Geoff (2020), organizations have ignored the potential savings from proper inventory management, treating inventory as a necessary evil and not as an asset requiring management.

Investment in inventory in public institution takes up a big percentage of the total budget, yet inventory control is one of the most neglected management areas in public institutions such as the polytechnics (Sander, Matthias & Geoff, 2020). Many public enterprises have an excessive amount of cash tied up to accumulation of inventory due to inadequate inventory management or inability to control the inventory efficiently. By implication, poor inventory management translates directly into strains on an organization's cash flow and may not be unconnected with poor employees' performance. Consequent upon the foregoing, it is imperative to ascertain the effects of inventory management practices on performance of selected polytechnics in Southwest, Nigeria.

Agus and Noor (2020) also stated that precise forecasting of demand allows the business to reduce operating expenses, improved efficiency and on time supply of

products and services for the future requirements by fulfilling the growing expectations of customers. This leads to increased consumer fulfillment as the outcome of the best value of products and services provided, also improved organizational effectiveness as well as staff efficiency. In a similar vein, previous studies have established that improper inventories control management may cost an organization a loss ranging from 25 percent to 40 percent of the expected value, resulting from lost sales as a direct consequence of customer dissatisfaction (Makweba & Xi, 2019). Thus, efficient inventory control system is part and parcel of supply chain activities to enable the organization to have sustainable competitive edge in the market and to improve firm's profitability as well.

An effective and efficient inventory management flow across the value chain is one of the key factors for success of large and small enterprises. The challenge in managing inventory is to balance the tradeoff between the supplies of inventory with demand. Ideally, an organisation wants to have enough inventories to satisfy the demands of its customers. On the other hand, the organisation does not want to have too much inventory staying on hand because of the cost of carrying inventory. Inventory decisions are high risk and high impact for the supply chain management of an organization. According to Dimitrios (2018), inventory management practices have come to be recognized as a vital problem area needing top priority, hence, training employees to acquire requisite skills in inventory management is crucial to organizational success.

Employee performance as moderating construct has continuously gained huge attention since a few decades ago due to its influence on the overall performance of both public and private enterprises. According to Silitonga and Sadeli (2020), employee performance is frequently interpreted as representative of the organization's performance and has both direct and indirect impact on the organization's image. Khan and Mashikhi (2017) stated that performance has been considered as the ultimate outcome of an organization as well as an employee. Creativity, innovation, and a higher level of commitment among employees are the sources of organizational success and glory. Prange and Pinho (2017) mentioned that, since human resources are an important factor in any organization, organizational productivity and efficiency depend on the performance of its employees. The survival of the organization will depend on their ability to provide the employees with the necessary skills required to achieve success in their responsibilities. Enhanced capabilities, knowledge, and skills are the foundation for the organization's competitive advantage in today's global market (Rodriguez & Walters, 2017). Therefore, managers of organisations should consider meeting employees' mental and physical requirements and enhancing employees' personal and occupational performance using a variety of means and methods, such as training, performance review, and job design to affect the interaction

between inventory management and performance of polytechnic in Southwest Nigeria (Abdulkhaliq & Mohammadali, 2019).

Government of nations commit huge amount of money to ensuring efficient performance of their manpower. For example, Malaysia's Ministry of Human Resources spent around RM455,025 million on human capital development between 2019 and 2020. As a result, a critical part of Malaysia's human capital development is the requirement for employees to adapt to new knowledge and improve their job performance. According to the Public Service Department Circular (2006), the government's policy is to provide a minimum of seven training days per year to all employees, including those who work at tertiary institutions. The purpose is to make employees adapt to new ways of doing work and more efficient in the discharge of their duties so as to raise the bar of productivity.

Statement of the Problem

The dwindling performance and increasing cases of inefficiency among store employees in Nigerian polytechnics is the major factor that triggered this study. Statistical facts, such as Nigeria's Human Capital Index, could be used to illustrate the low or declining performance of the Civil Service. For instance, the poverty rate in Nigeria rose in the past three decades. It rose from 27.2% in 1990 to 46.3% in 2000, and in 2002, it dropped to 42.7%. By 2016, the poverty rate in Nigeria had risen to 65.6% (National Bureau of Statistics, 2022). By and large, the above stated statistical facts are indicative of the poor social conditions in Nigeria, which are some of the consequences of the faulty and/or non-implementation of policies, and the poor monitoring and evaluation of government policies and programmes - as a result of public sector corruption, inadequate material resources, lack of policy continuity (Makinde, 2022), lack of technical know-how, bureaucratic corruption, and the poor performance of public employees. Onyeacholem (2022) argues that the main reason for the high rate of non-implementation or poor implementation of policies, programmes and projects (that are meant to enhance Nigeria's Human Capital Index, Gross Domestic Product, and Physical Infrastructure Development) is the Nigerian civil servants' poor attitude to work.

The educational institutions, especially the polytechnics, contribute significantly to the economy in several ways such as training of technical manpower, middle level management employees as well as providing employment opportunities for both academic and non-teaching staff. The education sector in Nigeria contributes significantly to the gross domestic product of the country (National Bureau of Statistics, 2022). The contributions of the education sector are germane to the economy and more than double of the manufacturing sector, especially in the area of

technological change in the economy. More so, higher education stimulates research and hereby raises productivity which undoubtedly benefit the society. Regrettably, this subsector of the industry is facing both financial and non-financial problems due to poor inventory management practices. Some studies showed that a large number of enterprises fail because of incompetent staff put in charge of inventory management (Liedholm, MacPherson & Chuta 2020). The study by Tushabomwe (2022) revealed that poor record keeping and lack of basic inventory management experience and skills by staff of most central stores are major contributors to failure. Hence, it is imperative to empirically investigate the view of Tushabomwe (2020) in the context of some selected polytechnics in Southwest Nigeria.

Public enterprises have become less competitive due to poor inventory control systems. Countless public establishments have adopted inventory management systems in their efforts to achieve performance targets as well as to improve their operational efficiency. However, it appears less emphasis is placed on just-in-time inventory management in public institutions due to the notion that public enterprise is no man's enterprise. The consequences of this seem to have lowered the bar of organisation performance such as polytechnics as a sub-sector of the economy (NBTE, 2022).

Despite the perceived importance of just-in-time inventory management system in public tertiary institutions, it seems many polytechnics in the Southwest have not given the phenomenon the attention it desires and this seems to be responsible for mismanagement of tax payers' resources and lack of competence among store staff, leading to inefficiency and inadequate performances. The spirit of public service appears to have overwhelmed store staff across polytechnics in Southwest Nigeria as inventory are not properly maintained.

Consequent upon the foregoing, we hypothesise as follows:

H_0: Just-in-time (JIT) inventory management practice has no significant effect on performance of selected polytechnics in Southwest, Nigeria.

Literature Review

Just-In Time (JIT) Inventory

Just-In-Time technique is construed as aggregated practices that are used to do away with waste wherein materials, parts, and in place ordering immediately different items needed to meet instantly manufacturing requirements (Mazanai, 2022). These large-scale business methods are thought to cover the full inventory supply chain. Shared product design with suppliers and customers, moving away from incompatible

sourcing nearby suppliers, minimal machine determined times, and overall preventative protection are all identified components of JIT (Mazanai, 2022).

According to Mazanai (2022), JIT is an inventory technique used to improve a commercial enterprise's return on investment by reducing inventory and its associated wearing fees, as well as enhancing performance and, as a result, saving inventory management costs and lead time expenses. In an endeavor to obtain JIT, Bicheno (2022) argues that the process has to have indicators of what is going on everywhere inside the entire inventory system. JIT is said to result in significant improvements in a manufacturing company's return on the investment and optimum performance. It underlines the importance of manufacturing in the creation of devices that is, useful tools or devices that arrive when needed, neither in earlier time nor later time but on time (Bicheno, 2022), MuchaedepiMone and Mbugi (2019) and Chase (2019), cited in Adeyemi and Salami (2020). Furthermore, a just-in-time inventory system keeps stock levels low by only producing for particular customer requests. The outcome is a significant reduction in stock investment and scrap expenditures, despite the fact that, as the above-mentioned authors suggest, an excessive degree of coordination is required.

According to Farzaneh (2022), JIT can eliminate garage, investment, insurance, ordering, and shipping costs. However, it is contingent on the current circumstances. In the ideal circumstance, when all of the parameters are met, it is more cost-effective to choose JIT over EOQ since it results in a simultaneous reduction in purchase price, protection charge, and ordering fee, as Farzaneh recommends (2022).

Nonetheless, the adoption of JIT by polytechnics is not without some challenges. More often than not, overdependence of polytechnics on JIT suppliers may cause delay or disruption which invariably lead to stock out. This has the potential to hinder the smooth operation of functional units and departments. Notwithstanding the limitation of JIT, most polytechnics often make provision for functional units and departments by allocating certain amount to purchase consumables when there is stock out as a result of delay in making supply to the central store.

Employee Performance

The term “employee performance” signifies individual’s work achievement after exerting required effort on the job which is associated through getting a meaningful work, engaged profile, and compassionate colleagues/employers around (Karakas, 2020; Pradhan & Jena, 2020). Effective employee performance management system is imperative if an organization want to attain success. The performance-driven objective is expected to be aligned with the organizational policies so that the entire

process moves away from being event-driven to become more strategic and a people-centric perspective (London, 2023; Mone & London, 2019; Pradhan & Jena, 2020).

Islami, Mulolli and Mustafa (2018) on their part recognize managing performance as a planned process of which the key elements are agreement, measurement, support, feedback and positive reinforcement, which shaped outcomes in terms of performance expectation. Also, Bataineh (2017) highlight Employee's performance as a combination of efficiency and effectiveness of the employee's daily tasks to meet the expectations of the stakeholders. Smith and Bititc (2017) emphasis on improving performance measurement systems and performance management practices as factors of work's environment which enhance employee's engagement levels. Also, Mensah (2018) support their ideas when considered talent management as a critical success factor within companies which become the most core managerial value in our highly dynamic and uncertain market environment of the twenty-first-century era.

According to Shmailan, 2020, employee performance is an action, what employees do in carrying out the work done by the company. Performance in carrying out its functions is not independent, but always relates to employee job satisfaction and the level of reward given, and influenced by individual skills, abilities, and traits.

In this study, employees' performance will be viewed from the perspective of Shmailan (2020) who sees performance as an action and what employees do in carrying out their day-to-day responsibilities.

Theoretical Framework

The theoretical underpinning of this study is the theory of Constraints (TOC) developed by Goldratt (1984). According to the theory, the goal of every enterprise is geared towards helping organisations continually achieve their corporate objectives which include both the organisation and that of the employees. The Theory facilitates the examination of assumptions underlying traditional manufacturing rules, policies, and measures (Stein, 1997). It focuses on the few critical constraints that limit the success of the system (Gary, 2014). It precludes sub optimisation by ensuring that solutions to complex problems are effective at the company level. It is aimed at initiating and implementing breakthrough improvement through focusing on a constraint that prevented from achieving a higher level of performance (Nwangangi, *et al.*, 2015). It postulates that an organization is a system, and every system has at least one constraint limiting it from achieving its goal of making (more) money. In order to improve the performance of the system, these constraints must be identified (described) and corrective measures taken (a prescription). The theory is adjudged

suitable for this study because the inhibiting factor which can hinder optimum inventory control in the polytechnic is poor staff training and development. Once this constraint is removed, performance of employees in central stores across Nigerian Polytechnics will improve tremendously.

Empirical Review

Many studies have been conducted on inventory management practices by arrays of researchers in developed, developing countries and Nigeria.

Gołaś (2020) conducted a study on the effect of inventory management on employees' performance and profitability: evidence from the Polish food industry in Europe. The main purpose of this study was to verify the causative link between inventory performance and profitability of food companies. This was done using the panel data methodology at the level of Polish food industry sub-sectors. The study takes account of the inventory mix, which includes the stocks of raw and other materials, work-in-progress, finished products and commodities. The study found that just-in-time inventory management practice is positively correlated with financial performance.

Kwadwo (2022) investigated the impact of efficient inventory management on the profitability of manufacturing firms in Ghana. The study adopted the cross-sectioned design and employed the use of secondary data. The cross sections data gathered covered the period 2004- 2014 from the annual reports of four manufacturing companies listed in Ghana stock Exchange (GSE). The four companies were selected through the judgmental sampling procedure. Measures of profitability were examined and linked to proxies for efficient inventory management by manufacturers. The ordinary least square (OLS) that came in the form of multiple regression models was employed in data analysis. The study found that there is a significantly strong correlation between inventory management and profitability of manufacturing firms in Ghana.

The trio of Nwamgbebu, Oketa and Nweke-Charles (2019) investigated the impact of inventory management on the performance of public health institutions in Nigeria, evidence from Federal Teaching Hospital Abakaliki (FETHA). The specific objectives were to ascertain how inventory management and inventory records accuracy have impacted on the performance of public hospitals in Nigeria. The researcher adopted descriptive survey design which made use of primary data obtained from structured questionnaires. The questionnaire was administered to 72 senior staff in pharmacy store, procurement units, internal audit and account department, but only 58 where returned and valid for analysis of the study. The

hypotheses were tested using simple regression at 5% level of significance. The result of the analysis revealed that just-in-time inventory management has positive and significant effect on the performance of FETHA; while inventory records accuracy has positive significant impact on the performance of the same hospital.

Methodology

This study adopts descriptive survey research design. Descriptive survey research design is adjudged to be appropriate for this study because it provides an accurate account of the behaviour, opinions, beliefs, and knowledge of a particular individual or group through the use of questionnaire. The target population of the study comprises 736 management staff in selected polytechnics in Southwest, Nigeria. The management staff included in the study are the Rectors, Deputy Rector Academics, Deputy Rector Administration, Registrars, Deputy Registrars, Bursars, Directors in the bursary, Librarians, Deputy Librarians, Deans of Schools and Head of Departments of sixteen (16) Polytechnics in Southwest, Nigeria which had existed for minimum of ten (10) years prior to this study.

According to NBTE (2023), there are six (6) federal polytechnics, thirteen (13) State polytechnics and twenty-four (24) private polytechnics in Southwest, Nigeria. However, among these Polytechnics only sixteen (16) have existed for a minimum of ten years before the commencement of this study and they are so used for the study.

Multi-stage sampling technique was adopted for the study. The first stage involved stratification of the Polytechnics in Southwest, Nigeria into three strata namely federal, state and private. The second stage involved purposive selection of sixteen (16) polytechnics which had existed for not less than ten (10) years from the period of conducting this study. Using year of establishment and a minimum of ten years prior to the time this study was conducted, four (4) federal, six (6) state and six (6) private polytechnics respectively were selected for the study. This makes a total of sixteen (16) polytechnics in all. The third stage involved selection of the entire management staff of each previously selected 16 Polytechnics using census sampling technique. Members of management staff selected for the study are 16 Rectors, 16 Deputy Rectors (Academics), 16 Deputy Rectors (Administration), 16 Registrars, 80 Deputy registrars (Representing 5 Deputy Registrars of each of the 16 Polytechnics), 16 Bursars, 64 Bursary Directors (Representing 4 Directors in each of the 16 Polytechnics), 16 Librarians, 16 Deputy Librarians, 96 Deans of Schools (Representing 6 Deans in each of the 16 Polytechnics) and 384 Head of Departments (Representing 4 Departments in each of the 6 schools in the 16 Polytechnics). The last stage involved administration of the questionnaire to 736 respondents using convenience sampling technique.

Primary data were used for the study. Primary data used for the study were sourced from the management staff of the sixteen selected Polytechnics used for the study and were collected with the aid of questionnaire. The semi-structured questionnaire was used as the research instrument for the study. The instrument used for primary data collection was the questionnaire. The five (5) items used to measure JIT was adapted from Balanced Scorecard originally put forward by Kaplan and Norton (1992) to measure higher institutions' performance which was later modified by Kaur (2022). Exploratory Factor Analysis (EFA) through principal component extraction method was used to statistically measure construct validity of the instrument. The factor loading of the items were used to ascertain the Average Variance Extracted (AVE). The KMO and the Barlett test were utilized to decide the adequacy of the sample size. As indicated by Kaiser (1974), if the result of the Kaiser-Meyer-Olkin (KMO) is greater than 0.5, this implies that the question really measured the variables of the study.

The KMO and the Barlett test were utilized to decide the adequacy of the sample size. As indicated by Kaiser (1974), if the result of the Kaiser-Meyer-Olkin (KMO) is greater than 0.5, this implies that the question really measured the variables of the study.

This study is limited by the sample used and the number of geo-political zones covered. Only 736 respondents who are majorly principal officers from Polytechnics in one out of the six geopolitical zones in the country were used for analysis; however, this does not distort the finding of the study.

Data collected from respondents were described, summarised, coded and analysed with descriptive and inferential statistics using the Statistical Package for Social Sciences (IBM-SPSS) version 24.0 software. The descriptive statistics adopted were frequency distribution, percentages, frequency counts, weighted means and standard deviation while the inferential statistics was multiple regression.

Results and Discussion

Perception of Respondents on the variable of JIT Inventory Management

JIT was an essential inventory management technique that continually reduced wastage in inventory by ensuring that the materials issued to units and departments were judiciously utilized before a new request could be made. This implied that departments, units and Colleges that needed materials must first show evidence of judicious use of the old requisition before a new one might be issued. This was to ensure that materials waste was minimized and that the targeted economic order quantity on which a new request from the purchaser could only be possible was spread

evenly among units and departments. Akinteju and Folorunsho (2021) opined that with JIT, store manager was in a better position to know accurately how materials were being utilized. This according to the authors enabled the workability of store ledger and variation in economic order quantity might be determined predictably. This section, therefore, discussed the perception of respondents in relation to the variable of JIT.

Table 1: *Mean and Standard Deviation Computed for the variable of JIT*

S/N	Variable	N	Mean	STD	Rank	Remark
1	With Just-In-Time technique, have gained enough skills to minimize waste in materials Management environments	720	4.08	0.97	3rd	A Determinant of JIT
2	Placing order for different items needed to meet instant need has become easier.	720	4.13	0.82	2nd	A Determinant of JIT
3	JIT inventory technique has improved my efficiency on this job	720	4.21	0.74	1st	A Determinant of JIT
4	By keeping stock level low, just-in-time inventory has taught me the skill of prioritize needs	720	3.80	1.03	5th	A Determinant of JIT
5	JIT practices lead to reduction in stock investment and scrap expenditures.	720	4.04	0.98	4th	A Determinant of JIT

Source: Researchers' Fieldwork, 2024** Acceptable mean =3.00 on a five-point Likert scale **
A test item was a determinant of JIT if mean calculated> or equal to 3.00 or otherwise **STD= Standard Deviation **Rank was done on the basis of STD.

Table 1 presented the result of the mean and standard deviation computed for the variable of JIT inventory practice. Looking at the result in the table, it was discovered that a substantial number of the respondents agreed that With JIT technique; they had gained enough skills to minimize waste in materials management environments. This inference was based on the fact that the mean value computed for the test item of 4.08 was far greater than the acceptable mean of 3.00 with a standard deviation of 0.97 that indicated a slight dispersion from the mean. JIT inventory management was a modern store keeping management that aimed at minimizing both costs of keeping inventory and raw materials wastage in store. The major goal of this inventory technique was to ensure that materials in store were continually used to meet the needs of the departments, units and directorates in the selected institutions.

By this method, departments in need of any of the materials in store filled the materials requisition forms and passed same to relevant authority. It was the duty of the store manager to request for evidence of usage of existing or similar materials before issuing same to the units and departments requesting for the materials. Once this was satisfied, the materials were issued to the said department. On this note, Akinjide (2021) opined that the JIT went beyond using available materials in store to meet the needs of the various organizational units, thus, there must be evidence of

satisfactorily use of the old request since the available materials in store were just enough to meet the materials need of the organisation for a specific period. This allowed for no wastage and improved the skills of the store assistants in managing both requisition and cost of keeping inventory (Ojo, 2018).

In this regard, JIT ensured that both inventory costs of fixed and variable were reasonable within the limit of organization budgetary allocation. This enhanced the efficiency and effectiveness of the store managers, store supervisor and store attendance in managing the available inventory in store effectively. More so, a substantial number of the respondents the researcher interacted with revealed that with JIT their skills, knowledge and creativeness in inventory management had improved. This according to the respondents was because the JIT concentrated in minimizing wastage by not keeping unwanted inventory in store for long. In addition, unit and department request were strictly scrutinized in order to avoid a shortage of stock by ensuring that the existing issued to the departments were judiciously utilized before honoring another request. The test item was found to be a determinant of the variable of JIT and ranked in the 3rd position; thus, showing that the variable improved organizational performance.

Moreover, the result in Table 1 revealed that a sufficient number of the respondents agreed that placing order for different items needed to meet instant need had become easier. This assertion was premised on the fact that the mean value computed for the test statement of 4.14 was far greater than the acceptable mean of 3.00 with a standard deviation of 0.82 that indicated a slight variation from the mean. The value showed that with JIT placing an order for materials from the purchaser/suppliers had become easy. JIT allowed the suppliers to know when new material was expected from him. This helped the store managers to evaluate critically when materials in store might finish, thus, aiding him or her to quickly make a request for new supplies. One of the benefits of JIT was that it allowed continuous replenishment of store from the source suppliers with little embargo here or there. This enabled the store keepers to plan ahead adequately, thus, increasing his or her efficiency and effectiveness on the job.

On this note, Akinteju, Mohammed and Unchenna (2022) argued that JIT was time specific thus allowing the store keepers to continually update his knowledge. This greatly improved both skills and performance of the store managers since he was able to predict accurately when a new stock might be needed. In fact, an adequate number of senior and principal store keepers the researcher interacted with indicated that JIT had simplified placing order. This according to the respondents was because the method was continuously subject to change depending on the demand rate for materials from the store by departments and units in the polytechnics. In this regard,

as pointed out by the respondents, with increasing demand for materials in store, the JIT might change to time-specific in which suppliers were mandated to supply stock on daily or weekly bases. More so, with slow demand from departments, units and directorate JIT changed to time-waiting meaning that stock were expected from the suppliers at a specific date. This according to the respondents had improved their knowledge greatly on when and how to place order ensuring that store as a unit contributed effectively to the performance of their Polytechnics. The test item was found to be a determinant of JIT and ranked in the 2nd position, thus, showing that the variable might contribute positively to the performance of the selected Polytechnics in Southwest, Nigeria.

Also, it was noted from the result that an adequate number of the respondents agreed that JIT inventory technique had improved their efficiency on this job. This inference was premised on the fact that the mean value computed for the test item of 4.21 was higher than the acceptable average of 3.00 with a standard deviation of 0.74 that indicated an insignificant variation from the mean. The values showed that JIT inventory had improved the efficiency of the store keepers on the job. With JIT the store managers and assistants might learn how to keep the stock level at a given range in order not to be adding more to costs. More so, with JIT inventory the store could learn the stock level that might be economical enough for the polytechnics, thus, ensuring that both costs and stock were minimized and enough to meet the departmental and unit's needs.

The efficiency of the store managers and assistant might improve with JIT inventory with regard to when to place an order and time scheduled for an order. On this note, Akinteju (2021) opined that JIT inventory was all encompassed because it increased both the efficiency and effectiveness of store personnel. Also, many of the respondents the researcher interacted with indicated that JIT inventory had added meaningfully to their knowledge and skills of store management by teaching them the needs to be proactive, timeliness and planning for stock needs through better analytical skills that made store management easy. The test item was found to be a determinant of JIT and ranked in the 1st position, thus, indicating that the variable might affect organisational performance positively.

Furthermore, it was found that a substantial number of the respondents agreed that by keeping stock level low, JIT inventory had taught them the skill of prioritising needs. This inference was based on the fact that the mean value computed for the test item of 3.80 was far greater than the acceptable mean of 3.00 with a standard deviation of 1.03 that indicated a slight dispersion from the mean. The values showed that just-in-time inventory had helped to expose the store managers and assistants the skill of prioritising needs.

Polytechnics are combinations of units, departments and directorates functioning together for the achievement of the goal and vision of the school. Thus, as a result of this, the store keepers must know how to prioritise the needs of the departments, units and directorates by ensuring that the needs of the most important units, departments and directorates were first met before proceeding to satisfy the request of the other departments. This could only be achieved through JIT inventory. JIT inventory and its knowledge ensured that preference was used to satisfy the request of a core unit and departments in an organisation. This was because failure of the store managers to meet the needs of this core unit first could lead to the loss of customers and eventually result in the collapse of the organisation. In this regard, failure of the store managers to place priority on the materials requisition of relevant departments in the selected Polytechnics might cause reduction in students' enrollment, affect lecturers and administrative officials' commitment and affect performance negatively.

On this note, it is necessary for the store managers to always arrange departments and units' materials requests in order of relevance and importance to the overall achievement of their Polytechnics goal, but this could only be realized through the knowledge of JIT inventory. The respondents the researcher interacted with indicated that with JIT inventory priority was always the motive. This exposed the store managers and other assistants to the knowledge and skills of meeting materials needs of the units in order of importance. The test item was found to be a determinant of JIT and ranked in the 5th position, hence, showing that the variable enhanced organizational performance in the selected Polytechnics.

More so, it was observed from the result in Table 1 that adequate number of the respondents agreed that JIT practices led to reduction in stock investment and scrap expenditures. This conclusion was based on the fact that the mean value computed for the test item of 4.04 was far better than the acceptable mean of 3.00 with a standard deviation of 0.98 that indicated a slight variation from the mean. The values indicated that JIT inventory contributed to reduction in stock investment and scrap expenditures. It must be noted that the aim of JIT inventory was to ensure that sock investment was not too high as to wipe out any other investments that might enhance organisations' financial viability. Therefore, JIT ensured that stock were kept to a bare minimum and that only important stock copiously in use were in stock to meet the departmental needs of the organisation. This scenario reduced the expenditure an organisation might incur on scrap, thus, freeing more incomes for the organisation to meet other commitments.

On this note, Ogunniyi and Ashiru (2022) opined that the focus of JIT to maintain minimum stock level can help free more revenues than costs for the organisation. This enhanced the minimization of scrap expenditure, thus, enhancing

the maximization of revenue and service quality. One could say that JIT inventory contributed to cost reduction. This enabled the Polytechnics to free more incomes to meet other important priorities of the institutions, hence, adding meaningfully to the quality of services offered to students and stakeholders. The test item was found to be a determinant of JIT and ranked in the 4th position, thus, showing that the variable might affect performance of the polytechnics positively.

Test of Hypothesis

H_{o1}: JIT Inventory management has no positive and significant effect on employees' performance in selected Polytechnics in Southwest, Nigeria.

Table 2: *Regression Result (Ordinary Least Square)*

Variable	Coefficient	Standard Error	T-calculated	P-value
C	9.557625	9.887447	0.966642	0.4540
STMW	0.683138	0.083514	8.179940	0.0000
POBE	0.780749	0.100088	7.800620	0.0000
IMEJ	0.070602	0.012344	5.719540	0.0000
SPN	0.632137	0.081216	7.783413	0.0000
RSISE	0.602137	0.086168	6.987924	0.0000
	OTHER	**TEST**	**STATISTICS**	
R-squared	0.557174		Mean dependent var	20.76190
Adjusted R-squared	0.453341		S.D. dependent var	2.527138
S.E. of regression	1.868475		Akaike info criterion	4.096490
Sum squared resid	2471.769		Schwarz criterion	4.134901
Log likelihood	-1456.447		Hannan-Quinn criter.	4.111325
F-statistic	119.2573		Durbin-Watson stat	1.697611
Prob(F-statistic)	0.000000			

Source: Researchers' Computation, 2024 (E-view 10)

Components of JIT

STMW= Skill to minimize wastage

POBE= With JIT placing order needed to meet instant needs has become easy

IMEJ= JIT has improved my efficiency on the job

SPN= By keeping inventory low, JIT has taught me the skill to prioritise needs

RSISE= Reduction in Stock Investment and Scrap Expenditure

Table 2 presented the result of the OLS computed to investigate the first objective of the study. Looking critically at the result in the table, it was found that the relationship between JIT enhanced skills to minimize wastage and organisation performance in the selected Polytechnics was positive and significant. This inference was based on the fact that the regression coefficient computed for the variable of STMW of 0.68 was positive with a significant t-statistics value of 8.18. The values showed that a 1% increase in skills to minimize wastage through the JIT inventory management might cause a 0.68% improvement in the organisational performance. The sign of the variable of STMW was in tandem with a priori expectation for the variable; hence, STMW was a determinant of JIT that contributed positively to organisational performance since the variable was significant.

More so, the p-value of the t-statistics calculated for the STMW of 0.0000 was less than the critical value of 5%. This implied that the null hypothesis which stated that skills to minimize wastage in JIT were not significant on the performance of the Polytechnics was rejected. It is safe to infer that STMW was significant on the performance of the Polytechnics. The application of JIT inventory management might enhance the skills of the employees of the Polytechnics in central store on how to minimize materials and resources in store wastage. This was because the goal of the JIT was to ensure that the available resources in store was just enough to meet the needs of the directorates, units and departments in the selected Polytechnics without the desire to keep excess resources in store which might latter be wasted since there was no need for the resources.

This scenario of keeping excess resources in store rarely occurs in JIT inventory management due to matching order technique that continuously ensures that the resource needs of units and departments in the institution were just equal to or slightly above what were in the store. This knowledge of balancing inventory requests with the needs of the various segments in the selected Polytechnics greatly enhanced the skills of the store keepers and other assistants in the central store. It might also help the management of the institutions to leave within the limits of the institutions' resources. The JIT inventory management has improved the confidence of the management and central store employees with regard to effective management of inventory.

Furthermore, it was discovered that the relationship between the capacities of the JIT to make placing an order became easy and performance of the Polytechnics was positive and significant. This statement was premised on the fact that the regression coefficient computed for the test item of 0.78 was positive with a significant t-statistics value of 7.80. The values indicated that a 1% increase in the variable of placing an order had become easy might cause a 0.78% increase in the performance of the Polytechnics. The sign of the variable of placing an order had become easy was

in conformity with a priori expectation and, hence, placing an order had become easy was a determinant of JIT inventory management that contributed positively to the performance of the Polytechnics. In addition, the p-value of the t-statistics calculated for the variable of POBE of 0.0000 was less than the critical value of 5%. This showed that the null hypothesis which stated that PROBE was not significant on the performance of the organisation was rejected. It was reasonable to infer that PROBE was significant on the performance of the Polytechnics.

One of the greatest advantages of JIT inventory management method was to ensure that order was made before resources in the store were fully requested by the departments, directorates and units. Thus, from the past experiences the calculation of how much resources or materials needed to replenish the store back to its equilibrium had already been known in JIT, thus, allowing the store managers to make request for a new order after necessary management approval. This enhance continuous availability of materials in store for the needs of the various segments in the Polytechnics since the store managers were very well aware of when store level needed to be replenished. This scenario reduced the incidence of material wastage. It lowers cost of holding and eliminated unnecessary costs associated with ordering of materials that might not be needed by units, departments and directorates in the selected Polytechnics.

The result in Table 2 further indicated that the relationship between improved employees' efficiency on the job and performance of the selected Polytechnics was positive and significant. This inference was based on the fact that the regression coefficient computed for the variable of IMEJ of 0.07 was positive with a significant t-statistics value of 5.72. The values showed that a 1% increase in the adoption of JIT inventory management that enhanced employee efficiency on the job might cause a 0.07% increase in the performance of the selected Polytechnics. The sign of the variable of IMEJ was in conformity with a priori expectation for the variable. As a result of this, IMEJ was a good determinant of JIT that boosted employee efficiency on the job. The p-value of the t-statistics calculated for the variable of IMEJ of 0.0000 was less than the critical value of 5%. This implied that improved employee efficiency on the job was significant on the performance of the Polytechnics in the Southwest, Nigeria.

The adoption of JIT inventory management might contribute greatly to efficiency of the store managers and store assistants on the job. This was hinged on the fact that JIT exposed employees particularly the store managers and its assistants on the intricacies of store keeping that was timely and effective in meeting the various materials needs of the departments and units in an organisation. JIT inventory management did not wait for the various segments of an organisation to submit request

for materials before activating the necessary machineries needed to make such materials available. This was because from available records and past experiences of the store managers with the various departments and units in the Polytechnics, what each unit/department needed had already be known, thus, improving the pro-activeness of the store managers regarding materials need of each of the organisational segments.

On this note, Ogunmodede (2022) opined that the application of powerful scientific procedure in JIT to identifying the materials needs of each of unit and department in an organisation has improved job efficiency of store managers. With this procedure, the amount of materials that needed to be ordered were clearly identified without incurring ordering cost above the budgetary expenditure of the organisation. This greatly improved the efficiency and effectiveness of the store managers and store assistants on the job, hence, ensuring that the management of the Polytechnics worked within the budgetary order and holding costs of inventory allocation (Ogunmodede, 2022). This was the essence of inventory management practice.

Implications of the Study

The study discovered that JIT went beyond using available materials in store to meet the needs of the various Polytechnics units and departments, it is evident that its usage in the polytechnics make enough materials available in store to meet the materials need for the polytechnic for a specific period. It has also cut down the level of wastages in the polytechnic setting and improved the skills of the store assistants in managing both requisition and cost of keeping inventory. Units and departments request are strictly scrutinized in order to avoid a shortage of stock by ensuring that the existing issued to the departments were judiciously utilized before honoring another request. More so, JIT also ensure that both inventory costs of fixed and variable are reasonable within the limit of the polytechnic budgetary allocation. This enhances the efficiency and effectiveness of the store managers, store supervisor and store attendance in managing the available inventory in store effectively.

Conclusion and Recommendations

The study was motivated by the dwindling performance and increasing cases of inefficiency among store employees in Nigerian Polytechnics. The theoretical underpinning of this study is the theory of Constraints (TOC) developed by Goldratt (1984). The study adopted survey research while the population consist of principal officers of selected polytechnics in south west Nigeria. The sample of size of 736 was used to prosecute this study. Data collected through the instrument was analysed using

simple linear regression. It was concluded that JIT inventory management system boosted the performance of the selected Polytechnics in Southwest Nigeria.

In this study, only principal officers in selected Polytechnics in Southwest Nigeria were used. Future studies should seek the view of other store officers below the rank of the principal officers used in this study. In future, it would be important to do a comparative study of the effect of JIT inventory management system on performance between Polytechnics and the Universities in Nigeria.

On the basis of the findings of the study, it is recommended that the selected polytechnics must as a matter of priority consider only inventory management that can adapt very well with the Polytechnics' model of operation. For instance, JIT inventory management can only be used in a Polytechnic that has the necessary inventory software or JIT system inventory software that can facilitate the use of JIT inventory management system.

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