



Effect of Procurement Staff Training on Employee Efficiency in the National Board for Technology Incubation, Nigeria

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ABSTRACT

This study examined the effect of procurement staff training on employee efficiency in the National Board for Technology Incubation (NBTI), Nigeria. Specifically, the study investigated how the frequency of procurement staff training, relevance of training content, and level of professional certification affect employee efficiency within the organization. The study adopted a case study research design. The population of the study comprised 55 staff of NBTI drawn from the headquarters and across the 36 states of the nation. Census approach was adopted and 55 respondents were sampled. Structured questionnaire was used to collect primary data. The reliability of the instrument was confirmed using Cronbach's Alpha coefficients which ranged between 0.78 and 0.86, indicating strong internal consistency. Out of the 55 copies of the questionnaire issued out, 51 were retrieved and validly answered. Data were analyzed using descriptive statistics and multiple regression analysis at a 0.05 level of significance. The empirical findings revealed that all three predictor variables significantly affect employee efficiency in NBTI. The frequency of procurement training showed a significant positive effect on employee efficiency with a Beta coefficient (β) of 0.376, t-value of 4.713, and p-value of 0.000. The relevance of training content exhibited the strongest effect with a Beta coefficient (β) of 0.452, t-value of 6.241, and p-value of 0.000. Similarly, procurement staff certification level had a significant positive influence on employee efficiency with a Beta coefficient (β) of 0.287, t-value of 3.451, and p-value of 0.001. Based on these findings, the study concluded that procurement staff training is a critical determinant of employee efficiency in public institutions. The study recommended that NBTI institutionalize a structured and continuous training program, ensure that training content is tailored to actual job roles, and establish a certification-based career progression system to promote professional competence and sustained efficiency.

Keywords: Frequency of Procurement Staff Training, Relevance of Training Content, Level of Professional Certification, Employee Efficiency.

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1.0 INTRODUCTION

1.1 Background of the Study

Organizations are increasingly recognizing the critical importance of employee training as a strategic tool for enhancing performance and adapting to the rapidly changing demands of the modern work environment. The Fourth Industrial Revolution, marked by accelerated technological change, has made it imperative for both private and public institutions to continuously upgrade the skills of their workforce to remain competitive and efficient (World Economic Forum, 2023). Employee training enables workers to acquire new knowledge, sharpen existing skills, and respond more effectively to emerging job requirements,

thereby improving institutional responsiveness, innovation, and operational output (Becker and Gerhart, 2021). Furthermore, training initiatives help bridge skill gaps, promote professional growth, and improve job satisfaction, which altogether contribute to organizational success. Beyond general workforce development, there has been a global emphasis on sector-specific training, particularly in public procurement, where the integrity, efficiency, and transparency of financial management are paramount.

The need for procurement-specific training has become even more pronounced as governments and international development agencies continue to battle

procurement inefficiencies, corruption, and weak institutional capacity. The Organisation for Economic Co-operation and Development (OECD, 2021) highlights that procurement processes account for a significant proportion of government expenditure up to 30% in many countries and yet are highly vulnerable to waste and fraud when handled by inadequately trained personnel. The United Nations Office on Drugs and Crime (UNODC, 2022) further asserts that the lack of appropriate procurement training contributes to non-compliance with regulations, inflated contract costs, and project delivery failures, especially in developing nations. Effective procurement training is, therefore, not only a tool for improving technical competence but also a mechanism for safeguarding public resources, enhancing regulatory compliance, and promoting value for money. These imperatives underscore the critical role of procurement training in strengthening employee performance, particularly in public agencies where accountability and efficiency are mandatory.

Employee efficiency remains a fundamental determinant of institutional effectiveness and is a widely studied concept in public administration and organizational development. Employee efficiency refers to the ability of workers to complete their tasks with speed, accuracy, and minimal resource wastage, while consistently meeting established performance standards (Ajayi and Akinola, 2020). It encapsulates how well employees can transform inputs into valuable outputs under given conditions and is associated with high productivity, service delivery improvements, and optimal use of organizational resources. Three commonly used measures of employee efficiency are task execution speed, adherence to organizational guidelines, and reduction in work-related errors and misconduct (Okoye and Eze, 2021). These three measures are frequently used in evaluating how effectively employees carry out their roles, particularly in sectors where compliance, accuracy, and performance timelines are critical (Kato, and Berman, 2024; Mohammed and Ibrahim, 2022).

Procurement staff training has emerged as a specialized form of organizational training aimed at equipping employees with the technical, ethical, and operational skills required to perform procurement functions efficiently and in accordance with statutory and institutional guidelines. Procurement training covers both regulatory knowledge and practical competencies, such as tendering procedures, vendor management, contract negotiation, and ethical compliance. Three critical dimensions of procurement training are frequency of training, relevance of training, and certification level (Amaratunga and Haigh, 2023). Frequency of training refers to how regularly procurement staff are exposed to capacity-building activities within a defined period. Regular training is associated with improved retention of knowledge, familiarity with emerging procurement practices, and

enhanced responsiveness to regulatory changes (Adebayo and Fagbemi, 2021). Relevance of training refers to the extent to which the training content aligns with the actual job responsibilities and operational challenges faced by procurement staff. Relevant training contributes to job-specific competence, application of knowledge to real-world tasks, and improved decision-making (Ogunyemi and Ajiboye, 2022). Certification level reflects the formal qualifications or professional recognitions acquired by procurement staff, often through external bodies such as the Chartered Institute of Purchasing and Supply (CIPS) and Institute for Procurement, Environmental and Social Standards (IPESS). Higher levels of certification denote advanced proficiency, industry recognition, and adherence to global best practices (Nwachukwu and Aluko, 2021).

The interaction between procurement training and employee efficiency has gained prominence globally as institutions seek to improve procurement outcomes, especially in public financial management. Empirical evidence from advanced economies shows that systematic procurement training improves procedural compliance, accelerates procurement cycles, and reduces institutional risks (World Bank, 2022; OECD, 2021). In Nigeria, however, public procurement systems continue to face challenges related to slow processes, frequent errors, and regulatory breaches, many of which have been attributed to inadequate training of procurement staff. Although the Nigerian Public Procurement Act (2007) provides for the professionalization and continuous training of procurement personnel, implementation has been inconsistent across government agencies (Uzochukwu and Nwokoye, 2023).

The National Board for Technology Incubation (NBTI) was established in 2005 under the Federal Ministry of Science, Technology and Innovation to promote innovation-driven entrepreneurship through technology incubation in Nigeria. The Board supports technology-based start-ups by providing incubation facilities, business development services, and technical support across its centres nationwide. In executing its mandate, NBTI undertakes substantial procurement activities involving equipment, consultancy services, and operational projects. Consequently, the efficiency and competence of procurement personnel are critical to ensuring accountability, compliance, and effective service delivery within the Board.

The National Board for Technology Incubation (NBTI), Abuja, as a public institution mandated to facilitate innovation-driven development, relies heavily on efficient procurement operations for project delivery. However, anecdotal and observational evidence suggests recurring issues of delays, non-compliance, and transactional errors, all of which point to potential deficiencies in staff training. Addressing these performance gaps requires a careful evaluation of the

role that procurement training plays in enhancing employee efficiency within the organization.

1.2 Statement of the Problem

In the public sector, the procurement function plays a critical role in ensuring value for money, accountability, and timely service delivery. However, evidence shows that Nigeria continues to lose significant resources due to inefficiencies in procurement. For example, the Infrastructure Concession Regulatory Commission (ICRC, 2021) and the Bureau of Public Procurement (BPP, 2022) reported that weak procurement capacity and non-compliance with regulations contributed to project delays and wastage valued at over ₦20 billion annually across Ministries, Departments and Agencies (MDAs). Similarly, the 2021 report of the Auditor-General of the Federation revealed persistent issues such as irregular contract awards, poor record keeping, and breaches of procurement thresholds, all of which undermine efficiency (Auditor-General of the Federation, 2021). At the National Board for Technology Incubation (NBTI), Abuja, the procurement department is central to supporting innovation-driven initiatives and sustaining operational capacity, yet the Board appears to be increasingly faced with similar challenges, ranging from delays in procurement processes, non-compliance with procurement regulations, to frequent errors and risks of fraud in procurement transactions.

Preliminary observations and audit reports from MDAs (including NBTI) suggest that many procurement staff lack up-to-date knowledge of public procurement rules, ethical standards, and the technical skills necessary to perform optimally procurement activities including operation of digital procurement systems. These weaknesses often lead to bottlenecks in the procurement cycle, weak documentation, regulatory breaches, and avoidable financial losses. Furthermore, variations in staff qualifications and lack of professional certification raise concerns about the consistency and reliability of procurement outcomes. These have raised concern about the effectiveness of procurement training on employee efficiency in these MDAs and NBTI in particular.

Thus, while staff training is widely acknowledged as a mechanism for improving performance and compliance, it is unclear to what extent training in terms of its frequency, relevance, and certification outcomes actually translates to improved employee efficiency within the NBTI context. Additionally, there are limited studies on how training affects key dimensions of efficiency such as task execution speed, adherence to organizational guidelines, and the reduction of errors and unethical practices. This study is therefore, necessitated by the growing need to empirically assess the effect of procurement staff training on employee efficiency.

1.3 Objective of the Study

The main objective of this study is to examine the effect of procurement staff training on employee efficiency in the National Board for Technology Incubation. The specific objectives are to:

- i. Ascertain the effect of the frequency of procurement staff training on employee efficiency in the National Board for Technology Incubation.
- ii. Evaluate the effect of the relevance of procurement staff training on employee efficiency in the National Board for Technology Incubation.
- iii. Examine the effect of procurement staff certification level on employee efficiency in the National Board for Technology Incubation.

1.4 Hypotheses

- H₀₁:** The frequency of procurement staff training has no significant effect on employee efficiency in the National Board for Technology Incubation.
- H₀₂:** The relevance of procurement staff training has no significant effect on employee efficiency in the National Board for Technology Incubation.
- H₀₃:** Procurement staff certification level has no significant effect on employee efficiency in the National Board for Technology Incubation.

2.0 LITERATURE REVIEW

This section is dedicated to review of theoretical framework, conceptual framework and review of empirical studies related to the major concepts of the study.

2.1 Theoretical Framework

The Human Capital Theory, adopted as the anchor theory in this study, offers the most comprehensive explanation for the investment rationale behind training procurement staff and how such investments translate into measurable improvements in employee efficiency. This theory not only aligns conceptually with the key variables of the study but also provides an empirical justification for organizational training strategies in the public sector.

2.1.1 Human capital theory (HCT)

The Human capital theory (HCT) serves as the anchor theory for this study. First formally articulated by Theodore Schultz in the 1960s and further developed by Gary Becker (1964), HCT posits that investment in human capital through education, training, and experience leads to increased productivity and efficiency in the workplace. The theory treats individuals' knowledge, skills, and abilities as economic assets that can yield measurable returns, both for the individual and the organization. According to Becker (1993), just as organizations invest in machinery and infrastructure, they can similarly invest in people, expecting future gains in performance and output.

The assumptions of human capital theory rest on the conviction that education, training, and experiential learning directly strengthen the productive potential of individuals. At its core, the theory holds that investments in skills development are not arbitrary but yield measurable improvements in efficiency, creativity, and compliance within organizational settings (Becker, 1993). It recognizes that training produces both transferable (general) competencies and job-specific skills that enhance role performance and adaptability to diverse contexts (Schultz, 1961). By treating knowledge and expertise as assets, HCT assumes a clear causal pathway between the level of investment in human capital and the eventual outcomes in productivity, innovation, and organizational growth. Furthermore, the theory presupposes rational decision-making, suggesting that both individuals and organizations carefully evaluate the costs and benefits of training initiatives, choosing to invest when the expected returns; whether in higher performance, reduced errors, or enhanced competitiveness, justify the expenditure. Implicit in this is the belief that organizations that neglect training undermine their own efficiency, while individuals who fail to build skills risk reduced employability and relevance.

The relevance of human capital theory to this study is robust and multidimensional. To start with, the theory offers a compelling rationale for the systematic training of procurement staff as a means of improving their efficiency in terms of speed of task execution, accuracy in procurement documentation, and compliance with procurement regulations. Training in this context is viewed not merely as a cost but as a long-term investment with the potential to reduce procurement errors, improve service delivery, and ensure value for money in public expenditure. Also, HCT supports the idea that the quality and frequency of training, its relevance to the job, and the level of certification attained all contribute significantly to individual performance outcomes—thus aligning with the independent variables examined in this study. In the specific case of the National Board for Technology Incubation (NBTI), procurement staff function within a regulatory and strategic environment that demands high levels of accuracy, transparency, and speed. Errors, delays, or non-compliance with procurement laws can result in significant losses or administrative sanctions. Through the lens of Human Capital Theory, training programs at NBTI are not just developmental initiatives but strategic tools for institutional efficiency. Therefore, HCT provides a comprehensive theoretical foundation for exploring how investments in staff training translate into measurable gains in employee efficiency within the procurement system of a public agency in Nigeria.

2.2 Conceptual Framework

2.2.1 Concept of procurement staff training

Staff training, in its most general sense, refers to the deliberate effort by organizations to enhance the

knowledge, skills, and behavior of employees to enable them to perform tasks more effectively and efficiently. Applied specifically within the context of procurement, procurement staff training is centered on equipping procurement personnel with the necessary capabilities to manage procurement activities in a structured, accountable, and performance-oriented manner. It addresses the practical and ethical demands of procurement functions within both public and private sector institutions.

The concept has been extensively explored in procurement and human resource literature. According to Cousins *et al.* (2022), procurement staff training is the structured process of developing procurement employees' capabilities through formal and informal educational programmes/, simulations, and work-based experiences to enhance performance, accountability, and policy compliance. This definition emphasizes the structured nature of the training process, highlighting that learning does not occur randomly but through carefully designed content and delivery channels aimed at achieving professional procurement standards. Amaratunga and Haigh (2023) define procurement staff training as a continuous educational and developmental strategy aimed at enhancing both the technical and managerial competencies of procurement staff in executing sourcing, contracting, negotiation, and supplier relationship responsibilities. The emphasis here is on continuity and dual development (technical and managerial) suggesting that procurement is not just transactional but strategic. Similarly, Zheng and Harland (2021) view procurement training as an Intentional organizational intervention meant to build procurement-specific capabilities for delivering value through cost optimization, regulatory compliance, and strategic sourcing outcomes. This framing suggests that the motive behind procurement training extends beyond knowledge transfer to include broader organizational goals of efficiency and impact.

In another perspective, Mwangi (2024) defines procurement staff training as a deliberate and targeted learning initiative aimed at empowering procurement personnel with legal, technological, procedural, and ethical knowledge for improved service delivery and institutional performance. This definition adds the dimensions of legality and ethics, especially relevant in public procurement where rules, transparency, and anti-corruption measures are paramount. Handfield *et al.* (2023) define procurement training as an integrated development system designed to strengthen procurement professionals' strategic thinking, risk management skills, and responsiveness to supply chain innovations. This definition captures procurement as a dynamic field that requires continuous skill alignment with technological, market, and regulatory shifts. From the above definitions, several key themes emerge. First, there is a common understanding that procurement staff training is not a one-off activity but a continuous process. Second,

the purpose of training is consistently tied to enhancing competence, improving performance, and ensuring compliance with policies, regulations, and ethical standards. Third, the definitions converge around key concepts such as capability development, learning, empowerment, compliance, strategic sourcing, risk management, and innovation. These themes suggest that procurement staff training is both a human capital investment and a strategic management tool used to align procurement operations with organizational goals and national development objectives.

In the context of this study, procurement staff training is defined as a continuous and strategic learning process through which procurement personnel acquire, update, and apply relevant knowledge, legal awareness, ethical practices, and technical competencies aimed at enhancing procurement performance, ensuring compliance, promoting accountability, and achieving value-for-money outcomes in institutional procurement systems. This definition synthesizes the elements of continuity, strategy, relevance, and compliance, emphasizing that procurement training is not only a tool for capacity development but also a mechanism for institutional integrity and public value creation.

2.2.2 Dimensions of procurement staff training

What makes procurement staff training has been conceptualized in various ways in academic and professional literature, often depending on the orientation of the study, whether strategic, operational, or developmental. For the purpose of this study, frequency, relevance, and certification level is adopted as the most appropriate framework for assessing procurement staff training as suggested by Amaratunga and Haigh (2023). This model provides a more tangible and measurable approach to evaluating training interventions, particularly within public and private sector institutions in Nigeria where training inconsistencies, policy misalignment, and lack of professionalization persist.

i. Frequency of Training

Training frequency refers to how often employees undergo formal or informal training interventions within a given time period. Different academic disciplines and professional domains interpret the frequency of training through varied lenses, each highlighting its significance for workforce development and organizational performance. From a human resource management standpoint, training frequency is often viewed as a critical determinant of employee performance and adaptability. Dossou and Baah (2022) describe it as the regularity with which employees are exposed to learning experiences intended to reinforce, refresh, or upgrade their competencies. This perspective holds that frequent training prevents skill stagnation and promotes organizational learning in dynamic work environments.

When applied specifically to procurement staff training, frequency takes on a specialized meaning. In

this context, it refers to how regularly procurement officers undergo training interventions to keep pace with developments in procurement laws, supplier engagement strategies, contract management, bidding procedures, and ethical standards. The procurement environment is characterized by continuous regulatory adjustments, digitization of processes, vendor performance reviews, and shifting supply chain dynamics. Hence, training that occurs sporadically or only in response to crises is insufficient. Instead, frequent procurement training ensures that staff remain up-to-date and are capable of making informed, timely, and compliant procurement decisions. This is especially vital in public sector institutions where procurement staff often encounter complex and high-value transactions that demand procedural accuracy and integrity (Silva and Adeyemi, 2023).

ii. Relevance of Training

Relevance of training refers to the degree to which training content, methods, and objectives align with the real-world tasks, responsibilities, and developmental needs of the targeted workforce. It is a critical determinant of training effectiveness and employee engagement, as it influences whether the knowledge and skills acquired are transferable to the workplace. The concept of training relevance has been interpreted in various ways by scholars, with each perspective providing insights into how training should be designed and evaluated for maximum organizational benefit. One dominant view, largely rooted in instructional design theory, perceives training relevance as the alignment between learning outcomes and job performance requirements. According to Mitchell and Gichane (2021), relevant training is that which delivers practical knowledge and skills tailored to the job-specific expectations and functional responsibilities of employees. From this lens, a training session is deemed relevant if its objectives can be clearly mapped to the participant's work tasks, thereby facilitating immediate application and improving work output.

When considered specifically in the context of procurement staff training, relevance refers to how well the training content and delivery methods reflect the actual regulatory frameworks, systems, ethical challenges, and operational realities of public procurement. Procurement is a complex and highly regulated function that is prone to systemic inefficiencies, market volatility, and integrity risks. Therefore, a relevant training intervention is one that addresses not only general procurement principles but also the specific institutional policies, digital platforms, documentation processes, risk mitigation strategies, and ethical considerations peculiar to the environment in which the procurement staff operate. For instance, if a training module on e-procurement fails to integrate the exact software platforms adopted by a government agency, or if it ignores local procurement law provisions, it may be rendered ineffective despite sound pedagogical design (Boateng and Mugisha, 2021).

iii. Staff Certification Level

Certification level refers to the formal recognition or validation of an individual's professional competence, typically awarded by accredited institutions upon successful completion of standardized training or examinations. The concept of certification is deeply embedded in modern professional development discourse, with varying interpretations depending on context, discipline, and regulatory frameworks. Broadly, certification affirms that an individual has attained a defined level of proficiency or mastery in a particular domain of practice and meets established industry or institutional standards. From a credentialing perspective, certification is viewed as a quality assurance mechanism that ensures the consistency and credibility of professional standards across sectors. According to N'Dri and Kobayashi (2021), certification systems serve as formal instruments to assess whether individuals possess the technical and ethical competencies required to perform in regulated professional environments. Within this framework, certification acts not only as a gatekeeper for employment but also as a marker of legitimacy in roles that carry high public trust, such as procurement.

In the context of procurement staff training, certification level specifically refers to the formal procurement qualifications or credentials attained by procurement officers, such as those awarded by professional bodies including the Chartered Institute of Purchasing and Supply (CIPS), the International Federation of Purchasing and Supply Management (IFPSM), or local equivalents like the Chartered Institute of Purchasing and Supply Management of Nigeria (CIPSMN). Certification in procurement not only signifies mastery of procurement knowledge and practices but also exposes staff to global standards, procurement ethics, and innovations that are key to effective performance. In environments where procurement systems are often plagued by inefficiencies, weak oversight, and capacity gaps, certified staff are more likely to demonstrate consistency, professionalism, and accountability in executing procurement functions.

2.2.3 Concept of employee efficiency

Employee efficiency has long been regarded as a key determinant of organizational performance, particularly in contexts where public accountability, resource optimization, and service delivery are paramount. Efficiency in this regard transcends mere activity levels, it encompasses the intelligent deployment of time, skill, and resources to achieve meaningful outcomes with minimal waste. In an era where public sector agencies are under increasing pressure to “do more with less,” employee efficiency becomes both a performance imperative and a governance concern.

Several scholars have attempted to define employee efficiency from a general workplace standpoint. For instance, Martins and Thando (2021) describe employee efficiency as the ability of staff to

produce maximum output using the least possible input while meeting quality standards. This definition emphasizes productivity, cost consciousness, and quality assurance. In a similar vein, Lu and Hernandez (2022) define it as the capacity of an employee to complete tasks in a timely and effective manner, ensuring that every action contributes directly to stated objectives. Time management and goal orientation are central to this conceptualization. Oladele and Ramanathan (2023) broaden the lens by defining employee efficiency as the integration of competence, motivation, and systems thinking to ensure seamless workflow and high-impact performance. Here, efficiency is not only technical but also behavioral and strategic. Again, according to Kato and Berman (2024), employee efficiency involves aligning personal competencies and organizational expectations through structured work processes, discipline, and outcome-driven routines. This view reflects the importance of systemic coordination and professional discipline.

In the field of procurement, where regulatory compliance, financial prudence, and value-for-money principles dominate operational logic, employee efficiency assumes a sector-specific meaning. Procurement staff are not merely clerical workers—they are institutional gatekeepers entrusted with ensuring timely and transparent acquisition of goods, works, and services. It is within this unique context that procurement-specific definitions of employee efficiency emerge. Bisset and Kamanga (2022) define procurement employee efficiency as the degree to which procurement staff execute procurement procedures accurately and within stipulated timelines, ensuring that the organization receives optimal value for its expenditures. Similarly, Rojas and Takyi (2023) describe it as the consistent ability of procurement officers to manage the procurement cycle (from planning to contract closure) with minimal supervision, while adhering strictly to regulations and ethical codes. This definition underscores both independence and compliance. A third view by Mohammed and Sekibo (2024) sees employee efficiency in procurement as the seamless integration of skills, ethical conduct, and technology to deliver procurement outcomes that meet needs, satisfy stakeholders, and reduce administrative bottlenecks.

2.2.4 Measures of employee efficiency

In seeking to assess employee efficiency meaningfully, especially within the procurement functions of public sector agencies, this study recognizes the need for measurable and operational indicators grounded in both theory and practice. Efficiency, while a multifaceted construct, can only be practically evaluated through dimensions that reflect an employee's real-time output, compliance behavior, and overall contribution to organizational goals. After reviewing relevant empirical and conceptual literature, this study adopts task execution speed, adherence to organizational guidelines, and reduction in work-related errors and misconduct as

its core indicators for measuring employee efficiency. These measures are not arbitrarily selected but are rooted in prior scholarly works and practical frameworks used in performance management. For instance, task execution speed has been highlighted by Andersson and Mitchell (2022) as a critical reflection of timeliness and productivity in administrative roles, especially in high-regulation environments like public procurement. Adherence to organizational guidelines finds support in the work of El-Kassem and Noor (2021), who argue that efficiency in public institutions is inseparable from procedural compliance and rule observance, which ensures transparency and integrity. Meanwhile, reduction in work-related errors and misconduct has been emphasized by Kimathi and Rutherford (2023) as a measure of professional competence, attention to detail, and ethical conduct—three pillars essential for effective procurement operations. Collectively, these measures reflect both performance quantity and quality, enabling the study to capture the technical, procedural, and behavioral dimensions of procurement employee efficiency. They also align with institutional expectations in the Nigerian public sector, where delays, non-compliance, and misconduct remain persistent threats to effective service delivery and financial accountability.

i. Task Execution Speed

Task execution speed is one of the most immediate and observable indicators of employee efficiency in organizational settings. It refers to the rate at which an employee completes assigned duties within a given timeframe without compromising quality or procedural compliance. In the context of public procurement, where time is often of the essence due to project deadlines, budgetary cycles, and regulatory schedules, task execution speed becomes an essential performance metric. Scholars have offered varying perspectives on this measure. D'Angelo and Mbatha (2021) describe task execution speed as the timeliness with which employees respond to job assignments and deliver outputs, emphasizing its role in reducing project delays and operational bottlenecks. Similarly, Guerrero and Fashanu (2022) define it as the velocity and consistency with which work processes are completed, asserting that in bureaucratic institutions, speed reflects both competence and institutional adaptability. A third view by Zhang and Olojede (2023) frames task execution speed as the synchronization between an employee's functional capacity and the time-sensitive expectations of their job role, particularly where process cycles are standardized, such as in procurement.

ii. Adherence to Organizational Guidelines

Adherence to organizational guidelines refers to the degree to which employees comply with the formal rules, policies, procedures, and ethical standards that govern their operations within an institution. In public sector procurement, where operations are guided by laws such as the Public Procurement Act (2007) in Nigeria, this adherence is central to both performance and

accountability. Scholars have defined it in various ways. Lee and Van Dalen (2021) describe adherence as the consistent alignment of employee conduct with formal work protocols and standard operating procedures. According to Attah and Jung (2022), it involves both passive compliance (following established rules) and active enforcement (reporting or correcting non-compliance). Another view by Rasheed and Watanabe (2023) expands the concept to include procedural loyalty, asserting that efficiency in bureaucracies is demonstrated not only by speed but also by disciplined conformity to institutional expectations.

In procurement settings, adherence to guidelines ensures that activities such as bid evaluation, contract award, vendor selection, and fund disbursement follow due process and avoid personal bias, corruption, or negligence. Staff who perform their tasks within the ambit of regulations help sustain transparency and value-for-money principles. Conversely, failure to adhere to these rules can lead to misprocurement, litigation, financial loss, and reputational damage. As Okoye and Omondi (2021) argue, public procurement agencies in Africa often suffer inefficiencies not because of the absence of guidelines but due to a lack of employee commitment to those guidelines. This observation makes adherence a credible measure of employee efficiency, particularly in governance and service delivery institutions.

iii. Reduction in Work-Related Errors and Misconduct

The third measure of employee efficiency adopted in this study is the reduction in work-related errors and misconduct. This dimension focuses on the extent to which employees minimize avoidable mistakes, omissions, and unethical behavior that undermine productivity and institutional integrity. Errors in procurement can range from simple clerical mistakes such as incorrect bid tabulations or wrong delivery timelines—to more severe issues like bypassing bid processes or falsifying documents. Misconduct, on the other hand, includes breaches such as conflict of interest, bribery, collusion, and professional negligence.

In procurement contexts, the consequences of employee errors and misconduct are far-reaching. A single error in bid scoring or pricing computation can result in awarding contracts to unqualified vendors, which may lead to cost overruns, abandoned projects, or substandard work. Misconduct, when unaddressed, creates a toxic environment that fosters fraud, weakens institutional credibility, and invites public scrutiny or sanctions from oversight agencies. As noted by Mensah and Dauda (2022), recurring procurement failures in African public institutions are more often tied to human failings than procedural limitations.

2.3 Review of Related Empirical Studies

Okoro and Mbachu (2024) explored the role of certification in improving procurement officer output in

a public transport regulatory agency in Nigeria. Certification was examined alongside employee performance metrics such as document accuracy, procurement cycle time, and frequency of corrections required by auditors. The researchers adopted a survey research design. The population of 180 officers was sampled down to 120 using stratified random sampling. Data were collected using self-report questionnaires and internal audit documents. The analysis employed chi-square tests and linear regression. The study found that staff with professional certifications outperformed their uncertified counterparts across all efficiency indicators. The study concluded that procurement officers with professional certifications consistently outperformed uncertified officers across efficiency indicators such as document accuracy and reduced cycle time, highlighting certification as a key driver of efficiency. However, the study did not include other training variables such as relevance or frequency, thus falling short of a holistic investigation like the current study. Additionally, the regulatory agency was not in a research or innovation domain like NBTI.

Ekanem and Olorunfemi (2024) conducted a study on the impact of training relevance on the efficiency of procurement officers in a federal Nigerian agency. The focus was on the alignment of training with national procurement policy changes and international procurement standards. The dependent variable was employee efficiency, measured by reduction in procedural errors and staff discipline records. The study used a descriptive survey research design. The population consisted of 210 procurement and logistics officers, and a sample of 125 was drawn through proportionate stratified sampling. Data were obtained using questionnaires and performance logs, and analyzed using regression analysis and ANOVA. While results showed that job-relevant training positively influenced staff efficiency, the study did not explore training frequency or certification status. The study concluded that training relevance, especially alignment with procurement policies and international standards, significantly improved employee efficiency by reducing errors and misconduct, underscoring the importance of job-related training. Though it was based in Nigeria, it was not conducted within a technology incubation agency, which limits its full contextual relevance.

Eniola and Obi (2024) conducted a study on the impact of procurement staff training frequency on efficiency outcomes within a public sector regulatory body in Nigeria. The study captured frequency of training as the number of formal and informal training sessions staff had attended over the past 24 months. Dependent variables included adherence to procurement rules and speed in task execution. The research design was a cross-sectional survey. The study targeted 185 procurement employees, with a final sample size of 120 selected via stratified random sampling. Structured questionnaires served as the data collection instrument,

while analysis involved correlation and stepwise regression. The results indicated a moderate to strong relationship between higher training frequency and improved task execution time and compliance rates. The study concluded that frequent training sessions positively influenced staff efficiency, particularly in compliance and task execution speed, confirming that training frequency is a meaningful predictor of procurement performance. Nonetheless, the study did not consider relevance or certification levels, nor did it measure efficiency using misconduct or procedural violation data, which are essential in the current study.

Adegoke and Udo (2023) examined the effect of frequency of procurement training on employee performance in a federal government institution in Nigeria. The study focused specifically on training frequency as an independent variable and its impact on two aspects of staff efficiency, namely, procurement processing time and compliance with public procurement guidelines. A descriptive survey research design was adopted. The population comprised 240 procurement officers across three departments, from which a stratified random sample of 130 staff was drawn. Data were collected through structured questionnaires and analyzed using regression and correlation techniques. Their findings revealed that officers who received more frequent training (at least quarterly) demonstrated faster task execution and fewer cases of guideline violations. The study concluded that procurement staff who received regular and frequent training performed better in terms of faster procurement processing and greater compliance with guidelines, reinforcing the value of consistent capacity building. However, the study did not consider training relevance or certification levels and did not disaggregate efficiency into detailed indicators like error reduction or misconduct, which the current study addresses. Moreover, while conducted in a public institution, the agency was not connected to innovation or technology incubation, limiting its direct applicability.

Ndwiga and Bello (2023) investigated how training frequency affects procurement officers' task delivery and record accuracy within a national procurement coordination agency. The study considered frequency of training as the independent variable and job performance (measured by the speed of document processing and the number of reported record errors) as the dependent variable. A descriptive research design was utilized. The population of the study consisted of 200 procurement officers, with a sample size of 110 selected using purposive sampling. Data were collected via both questionnaires and document review, and analyzed using regression analysis and descriptive statistics. Results showed that increased training frequency significantly improved documentation accuracy and reduced bid evaluation time. The study concluded that increased frequency of training significantly enhanced record accuracy and reduced evaluation time in procurement, demonstrating that

training frequency is vital for improving both technical and procedural performance. However, the study failed to include certification level or relevance of training as variables and only focused on technical output without examining behavioral dimensions such as misconduct or compliance, which are addressed in the current research.

Barrett and Helstrom (2023) examined the effect of training content alignment with job roles on procurement staff performance in a government finance bureau in Turkey. The key variable of interest was the relevance of training measured by how closely the training content matched job-specific competencies and evolving procurement practices. Employee efficiency was measured by compliance with procurement procedures and responsiveness to procurement queries. The study employed a descriptive research design. The population included 290 staff, from which a stratified sample of 145 officers was drawn. Data were collected using structured questionnaires and analyzed with Pearson correlation and regression analysis. The findings indicated a strong positive relationship between role-specific training and employee responsiveness. The study concluded that training content that is directly relevant to procurement job roles strengthened staff responsiveness and compliance, establishing the role of relevance as a crucial determinant of efficiency. The study, however, did not include training frequency or professional certification as variables, and it was not conducted in an innovation-focused agency, making it only partially applicable to the current study context.

Jaiyeola and Arinze (2023) carried out a study on the role of training relevance in enhancing procurement staff output in a regulatory agency in Nigeria. The variables were training relevance measured through feedback on training applicability and employee performance, gauged through document accuracy and compliance audit reports. A descriptive research design was employed, using a population of 175 staff, from which a sample of 110 was selected using systematic random sampling. Questionnaires and document reviews were the primary data sources, and the analysis was done using correlation matrices and stepwise regression. The results showed that when training content directly aligned with specific procurement challenges, staff efficiency improved significantly. The study concluded that training programs aligned with real procurement challenges significantly enhanced staff efficiency, reinforcing the centrality of training relevance in improving compliance and documentation accuracy. However, the study was limited by its singular focus on relevance without integrating frequency or certification status, thus limiting its holistic applicability to the current study framework.

Nkosi and Mabika (2022) investigated how relevance of staff training influences efficiency among procurement personnel in a state-owned energy corporation. The independent variable was training

relevance, operationalized by the applicability of training content to daily procurement activities. The dependent variable was procurement staff efficiency, captured through task execution rate and reduction in procurement-related complaints. The research design used was survey-based. The study population was 360, from which 180 staff were sampled using simple random sampling. Data were collected using self-administered questionnaires and validated through interview schedules. Analysis employed multivariate regression and thematic content analysis. The results confirmed that relevant training content significantly improved staff output and accuracy. The study concluded that more frequent training sessions directly reduced bid processing delays and document errors, validating frequency of training as a factor in enhancing efficiency. Nonetheless, the study was carried out in a state enterprise and not in a public agency tied to research or innovation. Moreover, training frequency and certification were not included, reducing its comprehensiveness in line with the current study.

Aliyu and Tukur (2022) conducted a study in a federal procurement agency in Nigeria on the effect of professional certification on procurement personnel performance. The focus was on certification status (certified vs. non-certified) and efficiency outcomes such as process speed, document compliance, and responsiveness. The study used a descriptive research design. The population was 150 procurement staff, with 100 sampled through purposive sampling. Data were obtained via structured questionnaires and HR performance records, and analysis involved descriptive statistics and logistic regression. The results showed a significant positive relationship between professional certification and all dimensions of employee efficiency. The study concluded that when training was relevant and directly applicable to daily procurement roles, staff efficiency and task accuracy improved, highlighting relevance as a critical dimension of training effectiveness. However, the study was limited by its exclusive focus on certification without integrating training frequency or relevance, and it did not disaggregate certification levels (entry-level, advanced, etc.) to capture deeper variations.

Dlamini and Osoro (2021) examined the impact of frequency of training on procurement staff effectiveness in a state-owned enterprise. The study variables included the number of training sessions attended per year (independent variable) and staff efficiency measured by procurement cycle time and number of errors during documentation and evaluation (dependent variables). A quantitative descriptive research design was adopted. The population included 250 employees from procurement, audit, and logistics departments, and 150 were sampled using systematic random sampling. Data were obtained using standardized questionnaires and organizational reports and were analyzed using regression and chi-square tests. The study concluded that employees who received

training more than three times per year demonstrated significantly fewer errors and processed tasks more rapidly. However, it did not incorporate behavioral efficiency measures such as misconduct or compliance lapses, and neither did it address certification level or training relevance. Furthermore, the organizational context differed significantly from the National Board for Technology Incubation, Abuja.

Rosenthal and Chui (2021) investigated the effect of procurement certification on task performance and procedural discipline among supply chain staff in a Southeast Asian public infrastructure agency. Certification levels were measured in terms of credential tier and years since acquisition. Efficiency outcomes included speed of documentation, alignment with procurement standards, and vendor communication quality. The study utilized a mixed-methods design. From a population of 520, a stratified sample of 260 was selected. Data collection tools included online questionnaires, key informant interviews, and review of procurement reports. Quantitative data were analyzed through regression analysis while qualitative responses underwent thematic coding. Results indicated that certified staff showed markedly higher efficiency and fewer policy breaches. The study concluded that procurement professionals with higher-tier certifications exhibited greater task efficiency, stronger adherence to procedural standards, and improved vendor communication, highlighting certification as a key enabler of performance. However, as the research was situated in a country with highly digitalized procurement systems, contextual differences may limit its direct applicability to a Nigerian public agency operating under different constraints.

3.0 METHODOLOGY

This study adopted a case study research design to examine the effect of procurement staff training on employee efficiency in the National Board for Technology Incubation (NBTI), Abuja. The design was considered appropriate because it enabled an in-depth investigation of procurement staff training practices within the Board as a single unit of analysis without manipulating the study variables. The target population comprised 55 employees, consisting of 5 senior management staff at the Headquarters, 14 procurement staff in Abuja, and 36 procurement staff across the 36 states of the federation, as obtained from the Personnel Unit of the National Board for Technology Incubation Headquarters, Abuja (2025). Owing to the relatively small population, the study adopted the census approach, making the entire population the sample for the study. Data were collected using a structured questionnaire divided into two sections: Section A elicited respondents' demographic information, while Section B contained

items measuring the dimensions of procurement staff training (training frequency, training relevance, and professional certification level) and employee efficiency, using a five-point Likert scale. The instrument was subjected to face and content validity through expert review and construct validity using Exploratory Factor Analysis (EFA). The KMO value of 0.823, Bartlett's Test significance of 0.000, and Total Variance Explained of 88.2% confirmed the suitability and validity of the instrument. Reliability was established through a pilot study involving 18 staff of the National Agency for Science and Engineering Infrastructure (NASeni) using Cronbach's Alpha, with an overall coefficient of 0.883, indicating high internal consistency.

Primary data were collected through the direct administration of questionnaires by the researcher, who subsequently retrieved the completed copies after respondents had sufficient time to respond. The study specified employee efficiency (EE) as the dependent variable and procurement staff training (PST) as the independent variable, proxied by training frequency (FPT), training relevance (RPT), and professional certification level (PCL). Employee efficiency was measured using task execution speed, adherence to organizational guidelines, and reduction in work-related errors and misconduct. The relationship among the variables was estimated using the multiple regression model: $EE = \alpha + \beta_1 FPT + \beta_2 RPT + \beta_3 PCL + \epsilon$, with the *a priori* expectation that all the explanatory variables would exert a positive effect on employee efficiency ($\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$). Data were analyzed using descriptive statistics (frequencies, percentages, and means) to summarize respondents' characteristics and answer the research questions, while multiple linear regression analysis was employed to test the hypotheses at the 5% level of significance using **Statistical Package for the Social Sciences (SPSS) version 25. The decision rule was to reject the null hypothesis where the *p*-value was less than 0.05 (or where the calculated *t*-value exceeded the critical value of 1.96); otherwise, the null hypothesis was accepted.

4.0 RESULTS AND DISCUSSION

4.1 Regression Analysis

The regression analysis was conducted to examine the influence of training frequency, training relevance, and staff certification levels on employee efficiency among procurement personnel at the National Board for Technology Incubation (NBTI). The model aimed to determine how effectively these three independent variables predict variations in employee efficiency, which serves as the dependent variable. The results are presented as model summary, analysis of variance and regression coefficients in Table 1, Table 2 and Table 3 respectively.

Table 1: Model Summary					
Model	R	R Square	R square adjusted	Std. error of the estimate	Durbin Watson statistic
1.0	0.872	0.760	0.748	0.418	1.944

a. Predictors: (Constant), Staff certification levels, Training relevance, Training frequency

b. Dependent Variable: Employee efficiency

Source: Author's Computations using SPSS 2025.

Table 1 presents the model summary results, which indicate a correlation coefficient R of 0.872, showing a strong positive relationship between the combined predictors (training frequency, training relevance, and staff certification levels) and employee efficiency. The R Square value of 0.760 reveals that approximately 76.0% of the variation in employee efficiency is jointly explained by the three independent variables. This means that changes in training frequency, training relevance, and staff certification collectively account for more than three-quarters of the observed improvements in employee efficiency at NBTI. The adjusted R Square value of 0.748 slightly corrects for the number of predictors in the model, confirming that the model remains highly reliable and generalizable.

Furthermore, the standard error of estimate (0.418) is relatively low, implying that the actual values of employee efficiency are close to the predicted values, indicating a good fit of the regression model. The Durbin–Watson statistic of 1.944 falls within the acceptable range of 1.5–2.5, suggesting that there is no autocorrelation among residuals. This confirms that the regression results are statistically valid and that the data meet the assumption of independence of errors. Overall, the model summary suggests a robust and statistically sound relationship, implying that NBTI's training and certification strategies are significant contributors to the efficiency levels of its procurement workforce.

Table 2: Analysis of Variance						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	48.621	3	16.207	92.804	0.000
	Residual	15.327	47	0.326		
	Total	63.948	50			

a. Predictors: (Constant), Staff certification levels, Training relevance, Training frequency

b. Dependent Variable: Employee Efficiency

Source: Author's Computations using SPSS 2025.

Table 2 presents the ANOVA results, which assess the overall significance of the regression model. The table shows a regression sum of squares of 48.621 against a residual sum of squares of 15.327, yielding an F-statistic of 92.804 with a p-value (Sig.) of 0.000. Since the significance value is less than 0.05, the model is statistically significant at the 95% confidence level. This implies that, collectively, training frequency, training relevance, and staff certification levels have a statistically significant impact on employee efficiency. In

practical terms, the finding demonstrates that improving these human resource development factors can meaningfully enhance how effectively procurement officers perform their duties. The strong F-value also confirms that the regression equation provides a better fit to the data than a model that includes no predictors. Thus, the ANOVA result supports the hypothesis that employee efficiency is significantly influenced by the organization's investment in training programs and professional certification for procurement staff.

Table 3: Regression Coefficients				
Predictor	Unstandardized B	Standardized Beta	t	Sig.
(Constant)	0.726		4.081	0.000
Training Frequency	0.391	0.376	4.713	0.000
Training Relevance	0.487	0.452	6.241	0.000
Staff Certification Level	0.314	0.287	3.451	0.001

a. Dependent Variable: Employee Efficiency

Source: Author's Computations using SPSS 2025.

Table 3 presents the regression coefficients assessing the influence of training frequency, training relevance, and staff certification levels on employee efficiency at the National Board for Technology Incubation (NBTI). The results indicate that all three

predictors exert a statistically significant and positive influence on employee efficiency, as reflected in their unstandardized coefficients (B values), standardized betas (β), t-statistics, and significance (p-values).

Specifically, training frequency has an unstandardized coefficient (B) of 0.391, a standardized beta (β) of 0.376, a t-value of 4.713, and a significance level (p) of 0.000. This implies that for every one-unit increase in training frequency, employee efficiency increases by 0.376 units, holding other variables constant. The strong t-value and highly significant p-value ($p < 0.05$) suggest that training frequency is a critical determinant of employee efficiency in the organization. This finding underscores the importance of consistent and well-structured training programs in enhancing the operational performance of staff within NBTI.

Similarly, training relevance recorded the highest unstandardized coefficient ($B = 0.487$) and standardized beta ($\beta = 0.452$) among the predictors, with a t-value of 6.241 and p-value of 0.000. This implies that holding other variables constant, for every one-unit increase in training relevance, employee efficiency increases by 0.452 units. This indicates that the more relevant the training content is to employees' job roles, the greater their efficiency. The magnitude of its coefficient implies that training relevance contributes more strongly to employee efficiency than other factors. This finding suggests that ensuring alignment between training programs and actual job needs significantly boosts staff productivity, skill application, and overall institutional performance.

Furthermore, staff certification level also demonstrated a positive and significant effect on employee efficiency, with an unstandardized coefficient (B) of 0.314, standardized beta (β) of 0.287, t-value of 3.451, and p-value of 0.001. This implies that for every one-unit increase in staff certification levels, employee efficiency increases by 0.287 units, holding other variables constant. This result suggests that as employees acquire higher professional certifications, their efficiency improves. The relationship, though slightly weaker compared to training relevance and frequency, remains statistically significant. It implies that professional development and certification pathways contribute meaningfully to building a more competent and effective workforce.

4.2 Test of Hypotheses

This subsection presents the statistical testing of the three hypotheses formulated for the study using the regression coefficients obtained from the model. The decision on each hypothesis was guided by the standard statistical rule for hypothesis testing at a 5% level of significance ($\alpha = 0.05$) which states that: If the p-value is less than or equal to 0.05, or the computed t-value is greater than or equal to the critical t-value of 1.96, the null hypothesis (H_0) should be rejected, indicating a statistically significant relationship between the independent and dependent variables. Conversely, if the p-value is greater than 0.05 or the computed t-value is less than 1.96, the null hypothesis (H_0) should be

accepted, indicating that the relationship is not statistically significant. Based on this decision rule, each of the hypotheses was tested and interpreted as follows:

4.2.1 Test of hypothesis one

H₀₁: The frequency of procurement staff training has no significant effect on employee efficiency in the National Board for Technology Incubation.

This hypothesis assumes that the regularity or number of training sessions attended by procurement staff does not significantly influence how efficiently they perform their official tasks. According to the regression results, the variable "training frequency" recorded a t-value of 4.713 and a p-value of 0.000. Given that the t-value (4.713) is greater than the critical t-value (1.96) and the p-value (0.000) is less than the 0.05 significance level, the null hypothesis is rejected. It is therefore concluded that the frequency of procurement staff training has a significant effect on employee efficiency in the National Board for Technology Incubation.

4.2.2 Test of hypothesis two

H₀₂: The relevance of procurement staff training has no significant effect on employee efficiency in the National Board for Technology Incubation

This hypothesis assumes that the degree to which the content and delivery of training programs relate to actual job tasks has no significant influence on staff efficiency. The regression result reveals that training relevance produced a t-value of 6.241 and a p-value of 0.000. Since the t-value (6.241) exceeds the critical t-value (1.96) and the p-value (0.000) is below 0.05, the null hypothesis is rejected. The study therefore concluded that the relevance of procurement staff training significantly affects employee efficiency in the National Board for Technology Incubation.

4.2.3 Test of hypothesis three

H₀₃: Procurement staff certification level has no significant effect on employee efficiency in the National Board for Technology Incubation

This hypothesis assumes that possessing professional procurement certifications such as CIPS, NIGP, or CPSM does not significantly influence employee efficiency in the discharge of procurement duties. From the regression output, the staff certification level recorded a t-value of 3.451 and a p-value of 0.001. Since the t-value (3.451) is greater than the critical t-value (1.96) and the p-value (0.001) is less than 0.05, the null hypothesis is rejected. It is therefore concluded that procurement staff certification level has a significant effect on employee efficiency in the national Board for Technology Incubation.

4.3 DISCUSSION OF FINDINGS

This section presents a detailed discussion of the study's major findings based on the regression results

and a priori expectations. The discussion focuses on the three key objectives: the effect of the frequency of procurement staff training, the relevance of procurement staff training, and the procurement staff certification level on employee efficiency in the National board for Technology Incubation (NBTI). The interpretations are anchored on the statistical outcomes (β and p-values), the theoretical framework, and existing empirical evidence.

4.3.1 Effect of the frequency of procurement staff training on employee efficiency in the National Board for Technology Incubation

The first objective of this study was to determine the effect of the frequency of procurement staff training on employee efficiency in the National Board for Technology Incubation. The regression result in Table 3 shows that the frequency of procurement staff training (FPT) has a positive and significant effect on employee efficiency, with a Beta (β_1) value of 0.376, a t-value of 4.713, and a p-value of 0.000, which is less than the 0.05 significance threshold. This finding implies that an increase in the number of training sessions attended by procurement staff leads to a measurable improvement in their efficiency levels. Employees who receive frequent training are likely to demonstrate enhanced understanding of procurement processes, reduced procedural errors, and quicker task completion. From the theoretical perspective, this finding is supported by the Human Capital Theory (HCT), which posits that investment in employee training enhances skills and productivity. Frequent training contributes to continuous knowledge updating and skill refinement, enabling staff to adapt to emerging procurement regulations and technologies. Empirically, the finding corresponds with several studies. Eniola and Obi (2024) and Adegoke and Udo (2023) both reported that frequent procurement training sessions improve task execution speed and regulatory compliance among public sector staff. Similarly, Ndwiga and Bello (2023) and Dlamini and Osoro (2021) found that more frequent training significantly improved record accuracy and reduced bid evaluation time. The consistency across these studies supports the finding that regular and frequent training programs are vital for improving employee efficiency in procurement-related functions.

4.3.2 Effect of the relevance of procurement staff training on employee efficiency in the National Board for Technology Incubation

The second objective was to examine the effect of the relevance of procurement staff training on employee efficiency. The regression analysis revealed a Beta (β_2) coefficient of 0.452, a t-value of 6.241, and a p-value of 0.000. Since the p-value is less than 0.05, the result indicates a statistically significant positive relationship between training relevance and employee efficiency. This means that when training content is relevant to staff duties, organizational goals, and procurement standards, employee efficiency improves substantially. Relevant training helps staff perform their

roles more effectively by directly addressing the skills, knowledge, and regulatory updates they need for their daily tasks. Theoretically, the Human Capital Theory supports this outcome by emphasizing that targeted and need-specific training maximizes the return on training investment through improved employee performance. This finding is consistent with empirical evidence from several studies. Ekanem and Olorunfemi (2024) found that job-relevant training reduced procedural errors and improved staff discipline in a federal agency. Barrett and Helstrom (2023) and Jaiyeola and Arinze (2023) also observed that training relevance significantly enhances staff responsiveness, compliance, and documentation accuracy. Nkosi and Mabika (2022) reported similar outcomes, noting that when training content is directly applicable to job roles, it reduces bid processing delays and documentation errors. Collectively, these studies reinforce the finding that training relevance plays a crucial role in determining employee efficiency levels in public procurement institutions.

4.3.3. Effect of procurement staff certification level on employee efficiency in the National Board for Technology Incubation

The third objective was to assess the effect of procurement staff certification level on employee efficiency. The regression result showed a Beta (β_3) value of 0.287, a t-value of 3.451, and a p-value of 0.001, which is below the 0.05 threshold. This result indicates a significant positive relationship between staff certification level and employee efficiency. The implication is that certified procurement officers tend to exhibit higher efficiency through improved adherence to procurement standards, faster task execution, and enhanced decision-making accuracy. In theoretical terms, this outcome resonates with the Human Capital Theory (HCT), which asserts that investments in education and professional development increase worker productivity. Certification represents a formal recognition of professional competence and commitment to continuous learning, thereby improving efficiency and performance standards. Empirically, this result is in agreement with the findings of Okoro and Mbachue (2024), who discovered that certified officers consistently outperformed uncertified ones across multiple efficiency indicators.

5.0 CONCLUSION, RECOMMENDATIONS

5.1 Conclusion

Based on the empirical findings, the study concludes that procurement staff training remains a crucial determinant of employee efficiency within the National Board for Technology Incubation. The a priori expectation that all the training dimensions (frequency, relevance, and certification) would positively affect employee efficiency was fully confirmed. The results indicate that when procurement officers are exposed to regular and relevant training opportunities, their performance and adherence to organizational standards significantly improve. The study demonstrates that

relevance of training holds the highest influence on employee efficiency, underscoring the importance of aligning training content with specific job functions and procurement regulations. This shows that employees benefit most from training programs that directly address their day-to-day challenges and operational needs. Training frequency, which ranked second, also plays a vital role in ensuring continuous knowledge renewal and adaptation to dynamic procurement environments. Meanwhile, certification level ranked third but remains a strong performance enabler, as it institutionalizes professionalism and technical competence within procurement functions.

5.2 Recommendations

In light of the findings, recommendations are made to enhance employee efficiency through improved training practices at the National Board for Technology Incubation.

- i. The management of NBTI, through its Procurement Training and Capacity Development Unit, should institutionalize a structured annual training calendar that guarantees consistent training for procurement officers. This calendar should ensure that every staff member participates in at least two refresher courses annually, incorporating both internal and external learning platforms. Such regular exposure will keep employees abreast of current procurement policies, foster continuous professional growth, and sustain efficiency across all units of the agency.
- ii. Training programs should be designed based on empirical job analyses and policy updates, ensuring that they directly address the daily operational challenges faced by staff. Practical, problem-solving-oriented training modules should replace theoretical or generic sessions. This approach will ensure that staff not only understand procurement guidelines but can also apply them effectively to achieve error-free, timely, and compliant operations.
- iii. The Federal Ministry of Science, Technology, and Innovation, working jointly with NBTI, should create a career advancement policy anchored on procurement certification. This policy should reward officers who obtain higher levels of professional certification, such as Chartered Institute of Procurement and Supply (CIPS) qualifications, through incentives like promotions, allowances, or recognition awards. Encouraging certification will deepen professional competence, promote ethical practice, and enhance staff motivation, ultimately leading to improved institutional performance and efficiency.

5.3 Contribution to Knowledge

This study contributes to knowledge by empirically establishing the hierarchical effect of

training variables (training relevance, frequency, and certification level) on employee efficiency within National Board for Technology Incubation. The ranking outcome provides a nuanced understanding of which training dimension yields the most significant performance effect. It demonstrates that;

- i. Training relevance has the highest effect of employee efficiency within National Board for Technology Incubation ($\beta = 0.452$);
- ii. Training frequency has the moderate effect on employee efficiency within National Board for Technology Incubation ($\beta = 0.376$);
- iii. Staff certification level has the least significant effect on employee efficiency within National Board for Technology Incubation ($\beta = 0.287$).

5.4 Suggestions for Future Studies

This study made the following suggestions for future studies:

- i. Future research should consider expanding the scope of study to include other public procurement agencies in Nigeria, allowing for cross-institutional comparisons and broader generalization of results.
- ii. Further studies should also employ mixed-methods approaches by combining quantitative and qualitative data collection to capture deeper insights into the behavioral and contextual dynamics influencing training outcomes.

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