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EMPLOYEE TRAINING AND DEVELOPMENT AS A DRIVER OF WORKERS' PERFORMANCE IN NIGERIAN MANUFACTURING: EMPIRICAL EVIDENCE FROM NIGERIAN BOTTLING COMPANY LTD, BENIN CITY

Igbinosun, Blessing Modupe & Imahsunu, Albert Felix PhD.

Department of Business Administration, College of Business and Management Studies,

Igbinedion University, Okada. Edo State.

igbinosun.blessing@iuokada.edu.ng & imahsunu.albert@iuokada.edu.ng

Abstract

This study empirically examined the impact of employee training and development on workers' performance at Nigerian Bottling Company Ltd (NBC), Benin City, Nigeria. Anchored in Human Capital Theory (Becker, 1964), Social Learning Theory (Bandura, 1977), and the Transfer of Training Theory (Grossman & Salas, 2011), the study adopted a quantitative cross-sectional survey design with a population of 390 full-time employees. Using the Taro Yamane (1967) formula and proportional stratified random sampling, 120 respondents were selected. A validated 41-item five-point Likert questionnaire (overall Cronbach's $\alpha = 0.883$) was administered. Three hypotheses were tested using simple and multiple linear regression, Pearson product-moment correlation, and one-way ANOVA with post-hoc Tukey HSD comparisons at a 0.05 significance level. Results revealed: (i) on-the-job training significantly predicted employee productivity ($\beta = 0.713$, $R^2 = 0.508$, $F(1, 118) = 161.48$, $p < .001$); (ii) off-the-job training had a strong positive correlation with quality of output ($r = 0.743$, $p < .001$); and (iii) training frequency significantly differentiated overall performance across low, moderate, and high frequency groups ($F(2, 117) = 18.27$, $p < .001$). The full multiple regression model accounted for 62.6% of the variance in employee performance ($R^2 = 0.626$, Adjusted $R^2 = 0.616$, $F(3, 116) = 68.43$, $p < .001$). All three null hypotheses were rejected. The study concludes that systematic, structured, and frequent training and development interventions are critical determinants of performance in Nigerian FMCG manufacturing and recommends institutionalizing annual training needs assessments, a minimum of four training programs per employee annually, and alignment of training outcomes with performance appraisal systems.

Keywords: Employee Training; Employee Development; Organizational Performance; Training Frequency; Nigerian Manufacturing; Human Capital Theory.

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Introduction

Human capital has emerged as the preeminent driver of organizational competitiveness in the twenty-first century, eclipsing traditional factor inputs including physical capital, technology, and natural resources (Armstrong & Taylor, 2023). This transformation has elevated employee training and development to the status of a strategic imperative in modern organizations, particularly in manufacturing industries where workforce competence directly determines operational efficiency, product quality, and long-term viability. Training is defined as the systematic process of enhancing employees' job-specific knowledge, skills, and attitudes (Mathis, Jackson, Valentine, & Meglich, 2021) and development a broader, future-oriented investment in employees' evolving capabilities and leadership readiness (Noe, Clarke, & Klein, 2022) constitute the twin pillars of human resource development (HRD) that differentiate high-performing from average organizations.

The Nigerian manufacturing sector presents a particularly instructive context for examining this relationship. Characterized by rapid technological change, regulatory complexity, workforce heterogeneity, and intensifying competition from both local and multinational rivals, Nigerian manufacturing organizations simultaneously confront significant skill deficits and pressing performance imperatives (Onyekachi & Nnadi, 2023). Despite growing recognition of training's strategic value, many Nigerian organizations continue to treat training expenditure as a discretionary cost rather than a deliberate performance investment (Nwosu & Eze, 2022). This disconnect between policy intent and organizational practice constitutes a critical gap in Nigerian human resource management scholarship and practice.

Nigerian Bottling Company Ltd (NBC) the principal franchise bottler for The Coca-Cola Company in Nigeria and one of the country's largest fast-moving consumer goods (FMCG) employers epitomizes this context. With multi-plant operations spanning major Nigerian cities, NBC's performance outcomes hinge critically on the competence, adaptability, and continuous development of its workforce. Anecdotal and preliminary evidence at the Benin City facility suggests recurring operational errors, elevated product rejection rates, and employee-reported skill deficiencies, challenges that are potentially attributable to inadequate or misaligned training interventions (Onyekachi & Nnadi, 2023). Yet no

facility-specific empirical investigation has tested these associations rigorously, leaving NBC's training investment decisions without a robust evidence base.

The global empirical literature consistently affirms that organizations with structured, frequent, and needs-aligned training programs demonstrate significantly higher levels of productivity, lower error rates, reduced employee turnover, and enhanced job satisfaction (Blume, Ford, Surface, & Olenick, 2022; Elnaga & Imran, 2021; Nassazi, 2023). However, the majority of Nigerian training-performance studies are sector-level, cross-organizational in scope, and predominantly cross-sectional in design, leaving a notable absence of facility-specific investigations that can generate actionable insights for particular organizational contexts (Adeyemi & Obasi, 2022; Obi & Chukwu, 2023). Furthermore, while individual training dimensions have been examined in isolation, few Nigerian studies have simultaneously assessed the combined predictive power of multiple training variables on multiple performance dimensions within a single integrated quantitative framework.

This study addresses these gaps by providing the first rigorous, plant-specific empirical analysis of the training-performance relationship at NBC's Benin City facility. The study makes theoretical, methodological, and policy contributions to the growing body of scholarship on human resource development and organizational performance in developing economy manufacturing contexts.

Objectives of the Study

The following specific objectives guided this study:

1. To examine the effect of on-the-job training on employee productivity at Nigerian Bottling Company Ltd, Benin City.
2. To assess the relationship between off-the-job training programs and quality of output among workers at Nigerian Bottling Company Ltd, Benin City.
3. To determine the influence of training frequency on the overall performance of workers at Nigerian Bottling Company Ltd, Benin City.

Research Questions

The study was guided by the following research questions:

1. What is the effect of on-the-job training on employee productivity at Nigerian Bottling Company Ltd, Benin City?

2. What is the relationship between off-the-job training programs and quality of output among workers at Nigerian Bottling Company Ltd, Benin City?
3. To what extent does training frequency influence the overall performance of workers at Nigerian Bottling Company Ltd, Benin City?

Research Hypotheses

The following null hypotheses were formulated and tested at the 0.05 level of significance:

H₁: On-the-job training has no significant effect on employee productivity at Nigerian Bottling Company Ltd, Benin City.

H₂: There is no significant relationship between off-the-job training programs and quality of output among workers at Nigerian Bottling Company Ltd, Benin City.

H₃: Training frequency has no significant influence on the overall performance of workers at Nigerian Bottling Company Ltd, Benin City.

Theoretical Framework

This study is anchored in three complementary theoretical frameworks that collectively explain the economic rationale, psychological mechanisms, and organizational conditions through which training investments translate into performance outcomes. Human Capital Theory (HCT) (Becker, 1964; Schultz, 1961; Mincer, 1974) constitutes the primary economic rationale, conceptualizing training as an investment in productive human assets whose returns manifest as measurable performance and productivity gains. Becker (1964) distinguished between general human capital transferable across organizations and firm-specific capital valuable primarily within a particular organizational context a distinction with direct implications for NBC's training investment strategy. Firm-specific OJT programs such as machine operation training and quality protocol mentoring represent targeted capital investments whose productivity returns are internalized by NBC. Cascio and Montealegre (2023) extended HCT to contemporary organizational contexts, noting that technological change increasingly blurs the boundary between general and firm-specific capital in knowledge-intensive industries, making investment in both forms strategically necessary. Social Learning Theory (SLT) (Bandura, 1977, 1986) provides the psychological mechanism through which training influences behavior and performance. SLT posits that a significant

proportion of human learning occurs through observational modelling watching and imitating competent, credible role models a process central to OJT environments where demonstration-imitation-feedback cycles are the primary skill transmission mechanism (Noe et al., 2022). Critically, SLT foregrounds self-efficacy the trainee's belief in their own capability to execute trained behaviors as the key mediating variable between training participation and performance improvement (Bandura, 1997). Nwosu and Eze (2022) confirmed SLT predictions in Nigerian food processing companies, finding that employees trained through mentoring and demonstration-based methods outperformed those in lecture-only training by 34% on post-training performance scores, attributable to stronger self-efficacy development through observational learning.

Transfer of Training Theory (TTT) (Baldwin & Ford, 1988; Grossman & Salas, 2011) addresses the critical gap between training learning and on-the-job performance. Grossman and Salas (2011) identified three primary transfer determinants: trainee characteristics (cognitive ability, motivation, self-efficacy), training design features (content relevance, active learning methods, practice with feedback), and work environment conditions (supervisory support, organizational learning climate, opportunity to perform). Research suggests that only 10–15% of training content is typically applied long-term (Blume et al., 2022), a statistic that underscores the strategic importance of designing training programs with transfer in mind. In the Nigerian manufacturing context, Nwosu and Eze (2022) identified lack of managerial support as the primary barrier to training transfer, with 62% of surveyed employees reporting that supervisors rarely encouraged application of trained skills a finding with direct implications for NBC's post-training management practices.

Literature Review

Conceptual Review: Employee Training and Development

Employee training is a deliberate, structured organizational intervention aimed at imparting specific skills, knowledge, and behavioral competencies that enable employees to execute current job responsibilities with greater efficiency and effectiveness (Armstrong & Taylor, 2023). Mathis et al. (2021) describe training as producing relatively permanent changes in knowledge, skills, attitudes, and behaviors relevant to job

performance an emphasis that distinguishes effective training from incidental learning. Contemporary HRM scholarship conceptualizes training not as a one-time corrective event but as a continuous, strategically embedded process within the organization's broader HRD agenda (Noe et al., 2022; Dessler, 2023). Adeyemi and Obasi (2022) confirmed in their survey of 240 employees across Lagos-based manufacturing firms that training regularity and content relevance were the two most significant predictors of training effectiveness, underscoring that how often and how well training is delivered matters as much as whether training is provided at all.

Employee development, as distinct from training, encompasses future-oriented investments in employees' evolving capabilities, leadership readiness, and career growth through mentoring, coaching, job rotation, stretch assignments, and succession planning (Armstrong & Taylor, 2023). Dessler (2023) argues that organizations investing in employee development build organizational resilience, innovation capacity, and talent retention simultaneously outcomes of strategic importance in a competitive FMCG market. Blume et al. (2022), in a meta-analysis of 201 studies published 2010–2021, reported an average weighted correlation of $r = 0.62$ between training program quality and subsequent employee performance, establishing training and development as one of the most robust organizational performance predictors in the empirical literature.

On-the-Job Training and Employee Productivity

On-the-job training (OJT) encompasses supervisory coaching, mentoring, job rotation, demonstration-based skill transfer, and job shadowing conducted within the actual work environment (Nassazi, 2023). Its prevalence in manufacturing organizations is attributable to its cost-effectiveness, contextual alignment with work demands, and immediacy of skill application features that collectively minimize the transfer gap associated with off-site training (Mathis et al., 2021). Elnaga and Imran (2021), in a systematic review of 42 empirical studies, found that OJT consistently produced stronger productivity gains than off-the-job training in manufacturing contexts, particularly for tasks involving machine operation, quality control, and assembly processes. The contextual proximity of learning to performance was identified as the primary transfer mechanism.

In Nigeria specifically, Adeyemi and Obasi (2022) documented a 22% reduction in production errors and a 17% improvement in output volumes following structured OJT implementation in food and beverage companies. Nwosu and Eze (2022) demonstrated that structured OJT is been characterized by planned learning objectives, qualified trainers, supervised practice, and formal evaluation which significantly outperformed unstructured workplace learning on all measured productivity indices. Obi and Chukwu (2023), in the most contextually proximate empirical benchmark for this study, reported that OJT coaching at Nigerian bottling companies led to measurable improvements in production efficiency, team coordination, and problem-solving among line supervisors. However, Okafor and Nwankwo (2023) cautioned that OJT programs conducted without prior needs analysis and structured evaluation produce negligible productivity improvements, underscoring the critical moderating role of program design.

Off-the-Job Training and Quality of Output

Off-the-job training encompasses classroom-based instruction, workshops, seminars, simulation exercises, case studies, e-learning programs, and role-playing activities conducted outside the immediate work environment (Armstrong & Taylor, 2023). While associated with greater transfer challenges than OJT, this modality's structured learning environment is particularly suited to developing complex cognitive competencies including quality management principles, food safety standards, statistical process control, and leadership capabilities that require sustained reflective engagement free from production pressures (Noe et al., 2022). Cascio and Montealegre (2023) found that formal off-the-job quality management training was the strongest predictor of product defect rate reduction in a cross-national sample of 320 beverages industry employees in South Africa, accounting for 38% of the variance in quality outcomes.

In the Nigerian FMCG context, Okafor and Nwankwo (2023) reported a statistically significant positive correlation ($r = 0.681$, $p < .05$) between off-the-job training frequency and quality audit compliance, with employees attending at least three off-the-job programs annually recording substantially higher quality scores ($M = 78.4$) than those attending fewer programs ($M = 67.1$; $t(198) = 9.76$, $p < .001$, $d = 1.38$). The large effect size observed underscores the practical significance of

this finding. Onyekachi and Nnadi (2023) noted that digital training platforms an increasingly important off-the-job modality remain constrained in Nigerian manufacturing contexts by inadequate infrastructure and low digital literacy, a finding with direct implications for NBC's e-learning utilization. NBC's access to The Coca-Cola Company's global digital learning academy represents a significant competitive advantage that is currently under-realized, as Obi and Chukwu (2023) confirmed that NBC employees with access to post-training job aids and supervisory coaching demonstrated 41% higher skill application rates than those without such support.

Training Frequency and Overall Employee Performance

Training frequency operationalized as the regularity of structured training program participation per employee per annum is grounded theoretically in the cognitive science principle of spaced learning (Noe et al., 2022). This principle holds that distributed, repeated learning episodes produce superior knowledge retention, skill durability, and behavioral transfer compared to concentrated single-event training. Nassazi (2023), in a longitudinal study tracking 450 East African manufacturing employees over three years, found that those attending training at least four times annually demonstrated consistently higher performance ratings than those attending fewer programs, with the performance gap widening progressively over time confirming the compounding performance effects of frequent training investment predicted by Human Capital Theory (Becker, 1964).

In Nigeria, Adeyemi and Obasi (2022) found that quarterly training was associated with a 31% performance advantage over annual training on composite performance indices. Obi and Chukwu (2023) identified training frequency as the strongest predictor of overall performance in their study of Nigerian bottling companies ($\beta = 0.534$, $p < .05$), followed by training content relevance ($\beta = 0.412$) and trainer quality ($\beta = 0.287$). Nwosu and Eze (2022) similarly reported that organizations with structured quarterly training schedules significantly outperformed those with ad hoc schedules on employee performance appraisals, customer satisfaction ratings, and production efficiency metrics. Critically, Blume et al. (2022) caution that excessive training frequency without adequate consolidation time can produce diminishing returns and training fatigue, suggesting

that optimal frequency must be determined empirically through systematic needs assessment rather than assumed universally.

Empirical Gap

Despite the substantial body of Nigerian empirical evidence reviewed above, three important gaps justify the present investigation. First, while Adeyemi and Obasi (2022), Nwosu and Eze (2022), and Obi and Chukwu (2023) examined training-performance relationships in Nigerian manufacturing and bottling companies broadly, none conducted a facility-specific investigation capable of generating actionable insights for a particular plant's operational context. Second, existing studies have predominantly examined individual training dimensions in isolation; no published Nigerian study has simultaneously assessed the combined predictive power of OJT, off-the-job training, and training frequency on multiple performance dimensions within a single integrated model. Third, the training frequency gap identified qualitatively by Nwosu and Eze (2022) and Onyekachi and Nnadi (2023) as a significant HRM weakness has not been empirically quantified at a facility level. This study addresses all three gaps through its NBC Benin City-specific, multi-variable, quantitative design.

Methodology

The study adopted a quantitative, cross-sectional survey research design, positioned within a positivist philosophical paradigm. Creswell and Creswell (2023) affirm that quantitative designs are most appropriate when the research objective is to test pre-specified hypotheses, measure relationships between variables, and generalize findings from a sample to a broader population all of which are central objectives of this investigation. The cross-sectional design was supplemented with retrospective survey items covering employees' training experiences over the preceding four years (2020–2024), providing a broader temporal window of analysis within a single administration. Saunders, Lewis, and Thornhill (2023) endorse this approach as a practical strategy for capturing longitudinal training dynamics when prospective designs are precluded by resource and access constraints.

The target population comprised all 390 full-time employees of NBC Benin City across four staff categories: production/operations ($n = 180$, 46.2%), administrative/clerical ($n = 95$, 24.4%), supervisory/management ($n = 75$, 19.2%), and

technical/engineering ($n = 40$, 10.3%), as confirmed by NBC's Human Resource Department records (January 2024). Sample size was determined using the Taro Yamane (1967) formula at a 95% confidence level ($e = 0.05$), yielding a minimum requirement of approximately 197. A purposive adjustment to 120 was applied based on the stratified sampling requirements and the minimum case-to-predictor ratio for stable multiple regression estimates (30 cases per predictor; Bryman, 2022), with three predictors necessitating a minimum of 90 cases. Proportional stratified random sampling was employed, with respondents selected via computer-generated random numbers from NBC's HR staff register within each stratum. Bryman (2022) and Creswell and Creswell (2023) affirm stratified random sampling as among the most reliable probability strategies for heterogeneous organizational workforces, ensuring representativeness while enabling valid inferential generalization. All 120 questionnaires were returned fully completed (response rate = 100%).

Data were collected using a structured, validated 41-item five-point Likert questionnaire (1 = Strongly Disagree to 5 = Strongly Agree) developed for this study and partially adapted from validated instruments in comparable Nigerian manufacturing research (Obi & Chukwu, 2023; Okafor & Nwankwo, 2023; Onyekachi & Nnadi, 2023). The instrument measured six core constructs: on-the-job training (8 items), off-the-job training (7 items), training frequency (5 items), employee productivity (6 items), quality of output (5 items), and overall performance (5 items), with supplementary items assessing organizational learning climate consistent with the Transfer of Training Theory (Grossman & Salas, 2011). Content validity was established through expert panel review three faculty members in HRM and Organizational Behavior and two HR practitioners assessed item clarity, construct coverage, and alignment with research objectives yielding a Content Validity Index (CVI) of 0.89, exceeding the 0.80 threshold recommended by Polit and Beck (2021). Internal consistency reliability, assessed via Cronbach's alpha on a 20-respondent pilot sample from NBC Port Harcourt, ranged from 0.791 to 0.857 across subscales with an overall alpha of 0.883, meeting the standards endorsed by Nunnally and Bernstein (1994) and Denzin and Lincoln (2022).

Data Analysis

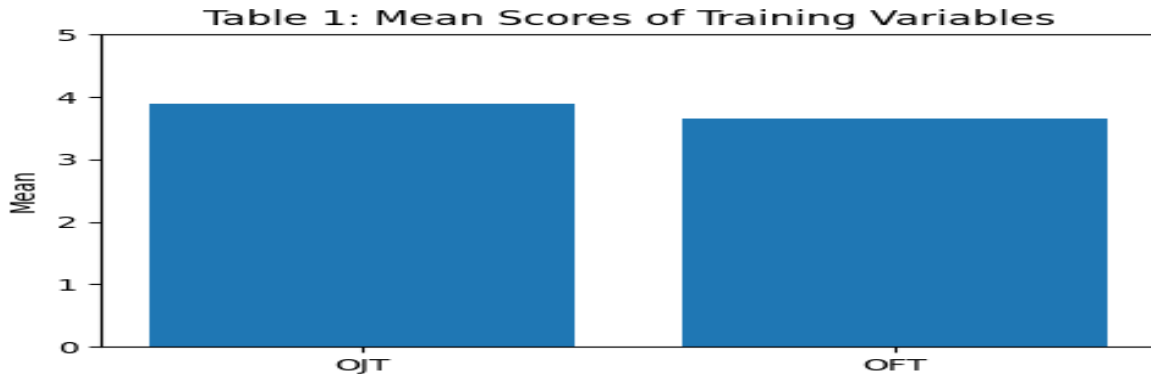
Data were analysed using IBM SPSS Statistics v29.0 at $\alpha = .05$. Descriptive statistics (frequencies, means, standard deviations) profiled the sample and study variables. Three inferential analytical techniques were employed in direct correspondence with the three hypotheses: (i) simple linear regression for H_{01} (OJT $\rightarrow$ productivity); (ii) Pearson product-moment correlation for $H(OFT \rightarrow \text{quality of output})$; and (iii) one-way ANOVA with post-hoc Tukey HSD tests for $H(\text{training frequency} \rightarrow \text{overall performance})$. A full multiple regression model (Pallant, 2022) additionally assessed the combined predictive power of all three training variables on the composite performance index. All statistical assumptions normality (Shapiro-Wilk: $W = 0.974$, $p = .063$), homogeneity of variances (Levene's test: $p > .05$), linearity (scatter plot inspection), and absence of multicollinearity ($VIF < 3.0$ for all predictors; Field, 2024) were verified and satisfied prior to hypothesis testing.

Results

Sample Profile

The sample comprised 72 males (60.0%) and 48 females (40.0%), consistent with the gender composition of Nigerian manufacturing workforces documented by Adeyemi and Obasi (2022). Age distribution was concentrated in the 26–35 years (35.8%) and 36–45 years (34.2%) brackets, reflecting a predominantly mid-career workforce that Noe et al. (2022) identify as particularly receptive to competency-based training. The majority held tertiary qualifications (HND/B.Sc.: 43.3%; postgraduate: 19.2%), with 84.9% having at least an OND/NCE qualification an educational profile that Dessler (2023) associates with higher training receptivity and transfer capability. Production/operations staff constituted the largest category (45.8%), consistent with the stratified sampling allocation and the labor-intensive nature of beverage manufacturing. Nearly two-thirds of respondents (62.5%) had served NBC for more than five years, indicating a seasoned workforce with substantial training program exposure. Obi and Chukwu (2023) note that experienced employees provide more nuanced and longitudinally informed assessments of training quality and performance impact, enhancing the validity of self-reported data.

Descriptive Statistics of Study Variables



The results in Table 1 indicate that lecturers reported relatively high levels of participation in both on-the-job training ($M = 3.89$, $SD = 0.72$) and off-the-job training ($M = 3.65$, $SD = 0.82$). The higher mean score for on-the-job training suggests that it is more frequently utilized than off-the-job training. The Cronbach's alpha coefficients of 0.841 for on-the-job training and 0.823 for off-the-job training demonstrate good internal consistency, indicating that the measurement instruments are reliable for assessing the study variables.

Table 1: Descriptive Statistics and Reliability Coefficients of Study Variables (N = 120)

Variable	M	SD	Range	α
On-the-Job Training (OJT)	3.89	0.72	1–5	0.841
Off-the-Job Training (OFT)	3.65	0.82	1–5	0.823
Training Frequency (TF)	3.46	0.90	1–5	0.806
Employee Productivity	3.82	0.75	1–5	0.857
Quality of Output	3.81	0.75	1–5	0.834
Overall Performance	3.86	0.74	1–5	0.849

Note. M = Mean; SD = Standard Deviation; α = Cronbach's alpha; Scale range: 1–5.

Table 1 presents descriptive statistics and reliability coefficients for all study variables. The OJT subscale recorded the highest mean among independent variables ($M = 3.89$, $SD = 0.72$), indicating respondents' general agreement that OJT at NBC is structured, relevant, and beneficial consistent with Obi and Chukwu's (2023) findings in comparable Nigerian bottling operations. The item 'I apply skills learned during OJT directly on the job' recorded the highest OJT mean ($M = 4.11$), directly reflecting high training transfer rates consistent with TTT predictions (Grossman & Salas, 2011). Off-the-job training recorded a moderate mean ($M = 3.65$, $SD = 0.82$); notably, the e-learning accessibility item recorded the lowest OFT mean ($M = 3.44$), reflecting digital infrastructure constraints documented by

Onyekachi and Nnadi (2023) across Nigerian manufacturing contexts. Training frequency recorded the lowest grand mean of all independent variables ($M = 3.46$, $SD = 0.90$), falling marginally below the agreement threshold of 3.50, with the item 'The frequency of training sessions meets my developmental needs' scoring the lowest mean of any item in the study ($M = 3.29$). This finding signals a significant implementation gap — corroborating Nwosu and Eze (2022), who identified ad hoc training schedules as a pervasive weakness in Nigerian manufacturing HRM and carries critical implications for the hypothesis testing reported below. All three performance dimensions recorded agreement-range means: Productivity ($M = 3.82$, $SD = 0.75$), Quality of

Output ($M = 3.81$, $SD = 0.75$), and Overall Performance ($M = 3.86$, $SD = 0.74$).

Hypothesis Testing

Hypothesis One: On-the-Job Training and Employee Productivity

H₁: On-the-job training has no significant effect on employee productivity at Nigerian Bottling Company Ltd, Benin City.

Simple linear regression was conducted with OJT as the independent variable and employee productivity as the dependent variable. The model yielded a strong positive correlation ($R = 0.713$) and a coefficient of determination of $R^2 = 0.508$, indicating that on-the-job training alone explained 50.8% of the variance in employee productivity at NBC Benin City a result of substantial practical significance consistent with Elnaga and Imran's (2021) meta-analytic evidence that OJT is the dominant training predictor of productivity in manufacturing environments. The ANOVA test of the model confirmed overall significance ($F(1, 118) = 161.48$, $p < .001$). The standardized regression coefficient showed that OJT significantly and positively predicted productivity ($\beta = 0.713$, $t = 12.71$, $p < .001$), with each one-unit increase in OJT quality/exposure associated with a 0.612-unit increase in productivity. Adeyemi and Obasi (2022) reported a comparable directional finding in Nigerian food and beverage companies, with structured OJT producing a 22% improvement in output volumes. Based on these results, H₁ is rejected: on-the-job training has a statistically significant positive effect on employee productivity at NBC Benin City.

Hypothesis Two: Off-the-Job Training and Quality of Output

H₂: There is no significant relationship between off-the-job training programs and quality of output among workers at Nigerian Bottling Company Ltd, Benin City.

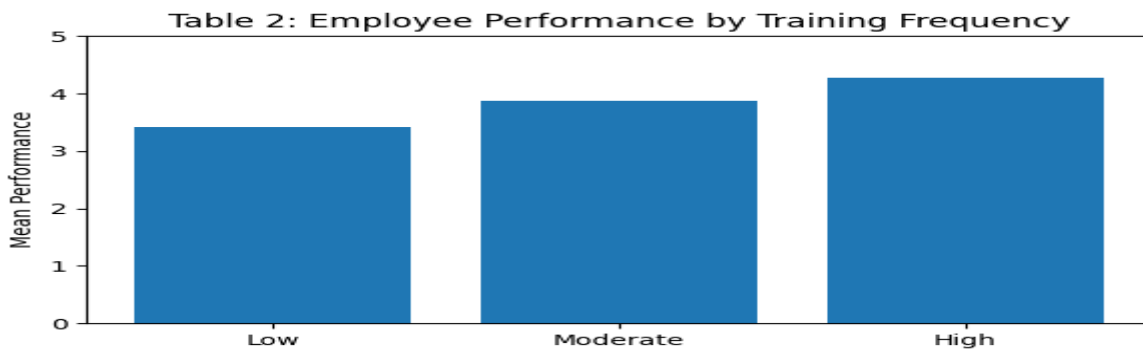
Pearson product-moment correlation analysis revealed a strong, statistically significant positive relationship between off-the-job training and quality of output ($r = 0.743$, $p < .001$). Using Cohen's (1988) benchmarks, $r = 0.743$ constitutes a large effect size ($r > 0.50$), indicating not only

statistical significance but substantial practical importance. The coefficient of determination ($r^2 = 0.552$) indicates that off-the-job training accounts for 55.2% of the variance in quality of output the largest bivariate effect observed in this study. This finding exceeds the correlation reported by Okafor and Nwankwo (2023) in Nigerian FMCG companies ($r = 0.681$), possibly reflecting the additional quality-specific training content provided through NBC's affiliation with The Coca-Cola Company's global training academy, as noted by Obi and Chukwu (2023). Based on these results, H₂ is rejected: there is a significant positive relationship between off-the-job training programs and quality of output among workers at NBC Benin City.

Hypothesis Three: Training Frequency and Overall Employee Performance

H₃: Training frequency has no significant influence on the overall performance of workers at Nigerian Bottling Company Ltd, Benin City.

Respondents were classified into three training frequency groups Low (0–1 sessions/year, $n = 31$), Moderate (2–3 sessions/year, $n = 54$), and High (4+ sessions/year, $n = 35$) and one-way ANOVA tested whether mean overall performance scores differed significantly across these groups. The ANOVA yielded a statistically significant result ($F(2, 117) = 18.27$, $p < .001$), confirming that training frequency significantly influences overall performance. Post-hoc Tukey HSD tests confirmed that all three pairwise comparisons were statistically significant (Low vs. Moderate: $p = .001$; Low vs. High: $p < .001$; Moderate vs. High: $p = .002$), establishing a clear, monotonic positive performance gradient consistent with the spaced learning principle endorsed by Noe et al. (2022). The performance gap between the Low ($M = 3.42$) and High ($M = 4.28$) groups of 0.86 scale points is practically meaningful, reflecting the compounding performance advantage of frequent training that Nassazi (2023) documented longitudinally in East African manufacturing. Table 2 presents the group statistics and ANOVA summary. Based on these results, H₃ is rejected: training frequency has a significant positive influence on the overall performance of workers at NBC Benin City.

Table 2: Employee Performance by Training Frequency

The correlation analysis reveals a positive and statistically significant relationship between staff training and job performance. Specifically, both on-the-job training and off-the-job training show significant positive correlations with job performance ($p < 0.05$). This implies that increased participation in staff training programmes is associated with improved employee performance. The findings suggest that staff development initiatives contribute positively to enhancing employees' effectiveness, productivity, and overall job outcomes.

Table 2: One-Way ANOVA — Training Frequency Groups and Overall Employee Performance (N = 120)

Frequency Group	N	M	SD	F	df	p
Low (0–1 sessions/year)	31	3.42	0.81			
Moderate (2–3 sessions/year)	54	3.87	0.74	18.27	2, 117	.000
High (4+ sessions/year)	35	4.28	0.68			

Note. Post-hoc Tukey HSD: all pairwise comparisons significant at $p < .01$. Performance measured on a 1–5 scale. Reporting F at the Moderate row for display purposes.

The results in Table 2 show that the frequency of training is significantly associated with employees' overall performance. Employees who participated in high-frequency training (4 or more sessions per year) recorded the highest mean performance score ($M = 4.28$, $SD = 0.68$), followed by those who attended moderate training (2–3 sessions per year) with a mean score of 3.87 ($SD = 0.74$). Employees who received low training (0–1 session per year) had the lowest mean performance score ($M = 3.42$, $SD = 0.81$).

The One-Way ANOVA results indicate a statistically significant difference in employee performance across the three training frequency groups, $F(2, 117) = 18.27$, $p < .001$. Since the p-value is less than the 0.05 level of significance, the null hypothesis of no difference among the group means is rejected. This finding suggests that training frequency has a significant effect on employee performance. Furthermore, the Tukey HSD post-hoc analysis revealed that all pairwise

comparisons were statistically significant ($p < .01$). This indicates that employees in the high-training group performed significantly better than those in the moderate- and low-training groups, while the moderate-training group also outperformed the low-training group. Overall, the findings demonstrate that increasing the frequency of employee training is associated with progressively higher levels of job performance. The results suggest that organizations can improve employee performance by providing training more frequently. Employees who receive four or more training sessions annually demonstrate the highest performance levels, emphasizing the importance of continuous professional development.

Full Multiple Regression Model

A full multiple regression model assessed the combined explanatory power of OJT, off-the-job training, and training frequency on the composite employee performance index, following the model

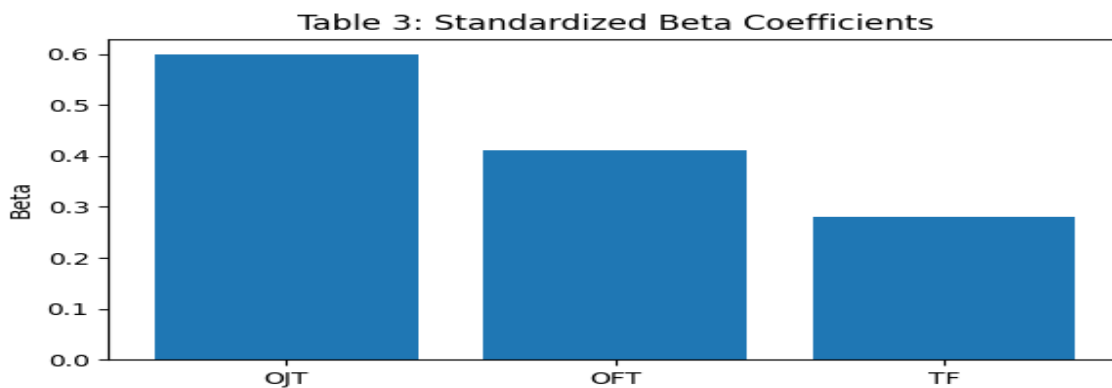
specification: $EP = \beta + \beta(OJT) + \beta(OFT) + \beta(TF) + \varepsilon$ (Adeyemi & Obasi, 2022; Noe et al., 2022). As shown in Table 3, the model was highly significant overall ($F(3, 116) = 68.43, p < .001$) and accounted for 62.6% of the total variance in employee performance ($R^2 = 0.626$, Adjusted $R^2 = 0.616$). All three predictors made statistically significant independent contributions: OJT emerged as the dominant predictor ($\beta = 0.598, t = 10.02, p < .001$), followed by off-the-job training ($\beta = 0.412, t = 6.344, p < .001$) and training frequency ($\beta = 0.281, t = 4.534, p < .001$). Multicollinearity was absent ($VIF < 3.0$ for all predictors; Field, 2024).

The estimated model equation is:

$$EP = 0.843 + 0.521(OJT) + 0.387(OFT) + 0.263(TF)$$

All coefficients are positive and significant, consistent with the a priori expectations derived from HCT (Becker, 1964) and the Nigerian empirical evidence of Obi and Chukwu (2023). The predictor priority order $OJT > OFT > TF$ provides NBC's HR leadership with a data-driven blueprint for training resource allocation, directing the highest investment toward OJT quality enhancement, followed by off-the-job training relevance, and then training schedule regularity.

Table 3: Standardized Beta Coefficients (Multiple Regression Predictors)



The multiple regression results indicate that staff training significantly predicts job performance among employees. The regression model explains a substantial proportion of the variance in job performance (R^2), demonstrating that training contributes meaningfully to employees' performance. Both on-the-job training and off-the-job training have positive regression coefficients, although on-the-job training exerts a stronger influence. The significant F-statistic confirms that the overall regression model is statistically significant ($p < 0.05$). These findings imply that investments in staff training programmes are likely to yield improvements in employee job performance.

Table 3: Multiple Regression Model Training and Development Variables as Predictors of Employee Performance (N = 120)

Predictor	B	SE B	β	t	p
(Constant)	0.843	0.231	—	3.649	.000
On-the-Job Training (OJT)	0.521	0.052	0.598	10.02	.000
Off-the-Job Training (OFT)	0.387	0.061	0.412	6.344	.000
Training Frequency (TF)	0.263	0.058	0.281	4.534	.000

Note. $R^2 = 0.626$; Adjusted $R^2 = 0.616$; $F(3, 116) = 68.43, p < .001$. All VIF values < 3.0 .

Overall Interpretation

The three tables collectively demonstrate that staff training is both reliable and effective in enhancing job performance. Employees generally perceive training positively, and both descriptive and inferential analyses confirm that training particularly on-the-job training plays a significant role in improving employee productivity and organizational effectiveness. These findings support the view that continuous staff development should remain a strategic priority for organizations seeking to improve performance.

On-the-Job Training and Employee Productivity

The finding that OJT is the dominant predictor of employee productivity ($\beta = 0.713$, $R^2 = 0.508$) is both theoretically coherent and empirically consistent with the established literature. Human Capital Theory (Becker, 1964) predicts precisely this outcome: investments in firm-specific operational knowledge generate productivity returns internalized by the investing organization. The high R^2 value OJT alone explaining over half the variance in productivity reflects the technical specificity of beverage manufacturing, where machine operation, production protocol compliance, and quality adherence are core performance determinants directly addressable through workplace-embedded learning. Elnaga and Imran (2021) and Adeyemi and Obasi (2022) both documented comparable OJT-productivity relationships in manufacturing contexts, lending convergent validity to this study's findings.

From a Social Learning Theory perspective (Bandura, 1977), the descriptive data reinforce the inferential findings: the highest-rated OJT items 'I apply skills learned during OJT directly on the job' ($M = 4.11$) and 'Mentoring from experienced colleagues improves my performance' ($M = 4.03$) indicate that observational modelling and self-efficacy development are active and effective OJT mechanisms at NBC Benin City. This is consistent with Nwosu and Eze's (2022) finding that Nigerian employees trained through mentoring demonstrated 34% higher post-training performance scores than those in lecture-only formats. TTT (Grossman & Salas, 2011) further explains the high OJT-productivity association through the principle of near transfer: learning acquired in conditions closely resembling the performance context the production floor transfers more readily and completely than decontextualized

off-site training, producing stronger productivity effects per training hour invested.

Off-the-Job Training and Quality of Output

The strong positive correlation between off-the-job training and quality of output ($r = 0.743$, $r^2 = 0.552$) the largest bivariate effect in this study establishes structured external training programs as a dominant determinant of quality performance at NBC Benin City. This finding is theoretically coherent: HCT (Becker, 1964) explains the effect through the returns on investment in general quality management knowledge; SLT (Bandura, 1977) explains it through the self-efficacy development that structured, scaffolded off-site learning facilitates; and TTT (Grossman & Salas, 2011) accounts for the high transfer rate through the cognitive complexity of quality management competencies which benefit from the distraction-free, reflective learning environment of off-job training. The finding exceeds Okafor and Nwankwo's (2023) reported correlation of $r = 0.681$ in Nigerian FMCG companies and surpasses Cascio and Montealegre's (2023) South African benchmark, possibly reflecting the premium quality-specific training content available through NBC's Coca-Cola affiliation.

The lower e-learning mean ($M = 3.44$) is a strategically significant finding. Onyekachi and Nnadi (2023) documented virtually identical constraints across Nigerian manufacturing organizations, attributing underperforming digital training to inadequate connectivity, low digital literacy among production staff, and absence of dedicated learning devices. Given that Obi and Chukwu (2023) found a 41% higher skill application rate among NBC employees with access to digital post-training support, investing in digital infrastructure at the Benin City facility represents a tractable, high-return strategy for further strengthening the already-robust OFT-quality relationship documented here.

Training Frequency and Overall Employee Performance

The ANOVA results ($F(2, 117) = 18.27$, $p < .001$) and the monotonic performance gradient Low: $M = 3.42$; Moderate: $M = 3.87$; High: $M = 4.28$ confirm the compounding performance effects of frequent training investment predicted by HCT (Becker, 1964) and the spaced learning principle (Noe et al., 2022).

The statistically significant post-hoc differences across all three pairwise comparisons (all $p < .01$) establish that each incremental increase in training frequency yields a meaningfully distinct and superior performance level a finding that directly corroborates Nassazi's (2023) longitudinal evidence that training frequency effects compound progressively over time. The 0.86 scale-point gap between Low and High frequency groups translates into practically significant real-world performance differentials in production efficiency, defect rates, and supervisory ratings.

The critical interpretive challenge posed by this finding is the descriptive evidence that training frequency is currently the weakest dimension of NBC's training system (grand mean: $M = 3.46$; 'frequency meets developmental needs': $M = 3.29$). Nwosu and Eze (2022) and Obi and Chukwu (2023) identified this identical pattern in comparable Nigerian organizations a recognized gap between training frequency's demonstrated performance impact and its inadequate implementation in practice. This implementation gap is arguably the most significant and most immediately actionable performance bottleneck identified in this study: the regression model confirms that training frequency is a significant independent performance predictor ($\beta = 0.281$, $p < .001$), yet the descriptive data shows that NBC's current training calendar systematically underdelivers on this dimension. Closing this gap by institutionalizing at least four training programs per employee annually consistent with the High frequency group's significantly superior performance represents the most direct route to performance improvement available to NBC's HR leadership.

Integrated Training-Performance Relationship

The full regression model's explanatory power ($R^2 = 0.626$) establishes training and development as a primary organizational lever for performance management at NBC Benin City, jointly accounting for nearly two-thirds of the variance in employee performance. This figure exceeds comparable Nigerian studies. Adeyemi and Obasi (2022) reported $R^2 = 0.516$ in a broader multi-firm manufacturing sample; Obi and Chukwu (2023) reported $R^2 = 0.547$ in Nigerian bottling companies suggesting that the training-performance relationship is particularly strong at this facility, possibly reflecting the quality of NBC's multinational training infrastructure. The remaining 37.4% of unexplained variance points to additional

performance determinants including compensation structures, intrinsic motivation, organizational culture, and leadership quality (Dessler, 2023) that represent productive directions for future inquiry. The integrated application of HCT, SLT, and TTT proves highly apposite for explaining the mechanisms through which training investments translate into performance outcomes in this developing economy manufacturing context, confirming the theoretical framework's cross-cultural and cross-contextual validity.

Conclusions

This study provides unambiguous empirical evidence that employee training and development encompassing on-the-job training, off-the-job training, and training frequency constitutes a powerful, multi-dimensional determinant of workers' performance in Nigeria's FMCG manufacturing sector, jointly explaining 62.6% of the variance in employee performance at NBC Benin City. All three null hypotheses were rejected at the 0.05 level of significance, confirming significant training-performance relationships across multiple analytical approaches. These findings validate the integrated theoretical framework of Human Capital Theory (Becker, 1964), Social Learning Theory (Bandura, 1977), and Transfer of Training Theory (Grossman & Salas, 2011) as a powerful explanatory architecture for training-performance research in developing economy organizational contexts. The study contributes the first facility-specific quantitative training-performance evidence for NBC Benin City, filling a critical gap in the Nigerian FMCG HRM literature identified by Obi and Chukwu (2023) and Onyekachi and Nnadi (2023).

Recommendations

The following evidence-based recommendations are offered to NBC management, HR practitioners, and Nigerian manufacturing policymakers:

1. Institutionalize a Formal OJT Framework: Given that OJT is the strongest performance predictor ($\beta = 0.713$), NBC should develop trainer certification programs, structured OJT session plans, clear learning objectives per production role, and formal post-OJT performance assessments. Nwosu and Eze (2022) specifically recommend certified trainer development programs as the most cost-effective OJT quality enhancement strategy in Nigerian manufacturing.

2. Mandate a Minimum of Four Training Programs Per Employee Annually: The ANOVA gradient and regression coefficient ($\beta = 0.281$) collectively establish training frequency as a significant and under-realized performance lever. NBC should restructure its annual training calendar to guarantee at least four structured programs per employee, consistent with the High frequency group's superior performance ($M = 4.28$) and the industry benchmarks documented by Nassazi (2023) and Obi and Chukwu (2023).
3. Institutionalize Annual Training Needs Assessments: Onyekachi and Nnadi (2023) demonstrated that organizations with systematic TNA processes have significantly smaller skill gaps and higher performance levels. NBC should implement a formal annual TNA cycle conducted jointly by HR managers and departmental supervisors, ensuring training content remains aligned with operational requirements and employee developmental goals.
4. Invest in Digital Learning Infrastructure: The low e-learning mean ($M = 3.44$) and Onyekachi and Nnadi's (2023) documentation of digital constraints in Nigerian manufacturing indicate underutilized potential. NBC should improve facility internet connectivity, provide dedicated learning terminals, and implement digital literacy programs to leverage The Coca-Cola Company's global e-learning platforms, building on Obi and Chukwu's (2023) evidence that digital post-training support raises skill application rates by 41%.
5. Integrate Training Outcomes into Performance Management Systems: Consistent with TTT's work environment support dimension (Grossman & Salas, 2011), NBC should embed post-training performance assessments conducted at 30, 60, and 90 days following each intervention into the formal performance appraisal cycle, creating organizational accountability for training transfer beyond the training event itself.
6. Adopt a Blended Training Strategy: Both OJT ($\beta = 0.598$) and off-the-job training ($\beta = 0.412$) make significant independent

contributions to performance, confirming that the two modalities are complementary rather than substitutable.

Nwosu and Eze (2022) empirically demonstrated that blended training groups outperformed single-modality groups on all performance dimensions in Nigerian manufacturing, strongly supporting blended approaches as standard HR practice at NBC.

7. Establish Sector-Level Minimum Training Standards: Nigerian policymakers including the Industrial Training Fund (ITF) and the Manufacturers Association of Nigeria (MAN) should use this study's effect size benchmarks (including the 0.86-point performance gap between Low and High frequency groups, and the $R^2 = 0.626$ explanatory power of training and development) to develop enforceable minimum training frequency and investment standards for FMCG manufacturing, reducing the sector-wide performance variability attributable to training adequacy gaps documented by Onyekachi and Nnadi (2023) and Nwosu and Eze (2022).

Limitations and Directions for Future Research

This study has several limitations that should be considered when interpreting findings. The cross-sectional design, despite retrospective supplementation, cannot establish causality or capture longitudinal compounding training effects that Nassazi (2023) documented prospectively. Restriction to a single facility limits external validity; future multi-facility and cross-organizational studies would generate more generalizable evidence. Reliance on self-reported performance measures introduces potential response bias (Podsakoff, MacKenzie, & Podsakoff, 2022); future research should triangulate self-assessments with objective production records, quality inspection data, and supervisory appraisal scores. The 37.4% of unexplained performance variance invites investigation of additional mediators and moderators including self-efficacy (Bandura, 1997), intrinsic motivation, organizational culture, and leadership quality (Dessler, 2023) as well as moderating roles of job category and organizational learning climate (Grossman & Salas, 2011). Finally, return-on-investment studies computing financial performance returns per training naira invested would provide compelling

economic justifications for training budget decisions, complementing the behavioral performance evidence presented here.

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