



Employee Training and Development Among Staff of a Polytechnic: Productivity, Strategic Alignment and Implementation Challenges

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Abstract

Objective: This study evaluated the impact of employee training and development initiatives on operational outcomes (productivity, strategic alignment, and implementation challenges) across staff cadres at Abubakar Tatari Ali Polytechnic, Bauchi. **Methodology:** A cross-sectional survey design was utilized with a stratified sample of 250 academic and administrative staff (Senior Management: $n = 60$; Middle Cadre: $n = 110$; Junior Support: $n = 80$). Primary data collected via the validated Employee Training and Organizational Growth Questionnaire ($\alpha = 0.84$) were analyzed using One-Way ANOVA and Tukey's HSD post-hoc tests. **Results:** Statistically significant inter-cadre differences emerged across all constructs ($p < .05$). Senior management reported significantly higher post-training productivity gains ($M = 3.48, p = .011$) and strategic goal alignment ($M = 3.32, p = .022$) than junior staff ($M = 2.81$ and $M = 2.76$, respectively). Conversely, junior ($M = 3.45$) and middle cadres ($M = 3.10$) experienced significantly greater operational implementation challenges than senior management ($M = 2.63, p < .05$). **Conclusion:** Training outcomes are structurally moderated by job hierarchy. Optimizing institutional growth requires participatory training needs assessments, enhanced post-training transfer resources for frontline staff, and transparent strategic communication.

Keywords: Training and Development; Employee Productivity; Strategic Alignment; Implementation Challenges; Staff Cadres; Polytechnic Education.

Introduction

Background of the Study

In modern human resource management, training and development (T&D) functions as a strategic lever for enhancing organizational efficacy, institutional capacity, and competitive advantage (Armstrong, 2022; DeCenzo & Robbins, 2021; Noe *et al.*, 2022). Public sector organizations and tertiary educational institutions increasingly rely on continuous skill acquisition to foster operational efficiency, technical proficiency, and pedagogical excellence (Adamu & Ado, 2026; Obadahun *et al.*, 2024). In polytechnic education, where curricula focus heavily on technical expertise and vocational competencies, continuous staff development is critical to adapt to rapid technological shifts, soft skill requirements, and digital integration (Grenda, 2026; Oyekunle *et al.*, 2024; Yusof *et al.*, 2023).

Grounded in Human Capital Theory, structured training is viewed as a capital investment that expands individual skill reserves, directly elevating employee productivity and institutional service quality (Becker, 1993; Nafukho *et al.*, 2004; Schultz, 1961). To support capacity building in Nigerian public tertiary institutions, interventions such as the Tertiary Education Trust Fund (TETFund) provide resources for staff development and academic transformation (Sulaiman *et al.*, 2025). However, translating these investments into observable performance requires clear alignment between training initiatives and institutional goals (Kaplan & Norton, 1996; Sung & Choi, 2021), alongside conducive work environments for learning transfer (Baldwin & Ford, 1988).

Statement of the Problem

Despite substantial capital investments and policy interventions aimed at staff development in Nigerian polytechnics, institutions continue to encounter hurdles regarding productivity outcomes, strategic alignment, and program execution (Adamu & Ado, 2026; Obadahun *et al.*, 2024; Sulaiman *et al.*, 2025). While institutional leadership often views training programs through high-level strategic objectives, operational personnel frequently face execution bottlenecks, including inadequate funding, limited facilities, poor training needs assessments, and insufficient administrative support (Oyekunle *et al.*, 2024; Yusof *et al.*, 2023).

Furthermore, empirical assessments often examine training outcomes at an aggregate level, overlooking how job hierarchies moderate training effectiveness (Salas *et al.*, 2012). Operational autonomy, work responsibilities, and resource access differ substantially across Senior Management, Middle Cadre, and Junior Support Staff (Boyatzis, 1982; DeCenzo & Robbins, 2021). At Abubakar Tatari Ali Polytechnic (ATAP), Bauchi, it remains unclear how staff cadres differ in their evaluation of productivity gains, strategic alignment, and implementation constraints. Without isolating these inter-cadre variations, institutional interventions risk deploying top-down training programs that fail to address frontline operational challenges or drive uniform organizational growth.

Research Objectives

The primary objective of this study is to evaluate the impact of employee T&D initiatives on key operational outcomes across staff cadres at ATAP, Bauchi. Specifically, the study seeks to:

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1. Determine whether significant differences exist across staff cadres regarding perceived employee productivity following T&D initiatives.
2. Evaluate whether significant differences exist across staff cadres in perceived strategic alignment between training programs and institutional objectives.
3. Assess whether significant differences exist across staff cadres regarding perceived implementation challenges facing T&D programs.

Conceptual Overview

Paradoxical Mindset (PM)

T&D is a planned, systematic process designed to enhance employees’ knowledge, skills, behavioral attributes, and operational capabilities to improve organizational performance (Armstrong, 2022; Noe *et al.*, 2022). In contemporary human resource management, T&D is recognized not merely as an administrative activity, but as a strategic mechanism vital for sustaining institutional competitive advantage (DeCenzo & Robbins, 2021). Within public sector institutions and higher education systems, training interventions focus on enhancing administrative efficiency, technical expertise, and pedagogical competencies (Adamu & Ado, 2026; Obadahun *et al.*, 2024).

Modern workforce demands have expanded the scope of T&D to encompass digital integration, technical proficiency, and soft skills acquisition (Grenda, 2026; Oyekunle *et al.*, 2024). In vocational and technical education, developing specific competencies enables academic staff to align instruction with evolving technological standards (Yusof *et al.*, 2023). Employee performance reflects the multidimensional output, efficiency, quality of work, and goal attainment demonstrated by staff relative to institutional benchmarks (Boyatzis, 1982; Kaplan & Norton, 1996). When supported by structural funding interventions—such as institutional grants and government initiatives—training programs facilitate capacity building and drive systemic transformation (Sulaiman *et al.*, 2025).

As conceptualized in Figure 1, systematic training directly builds core competencies and skills, which sequentially drive individual and organizational performance outcomes.

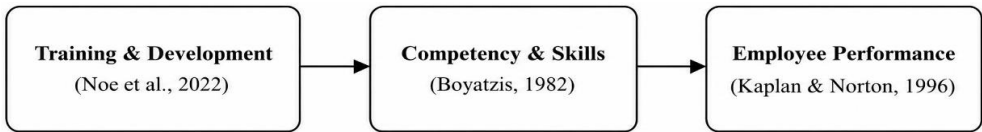


Figure 1. Conceptual Framework Linking Training & Development, Competencies, and Employee Performance

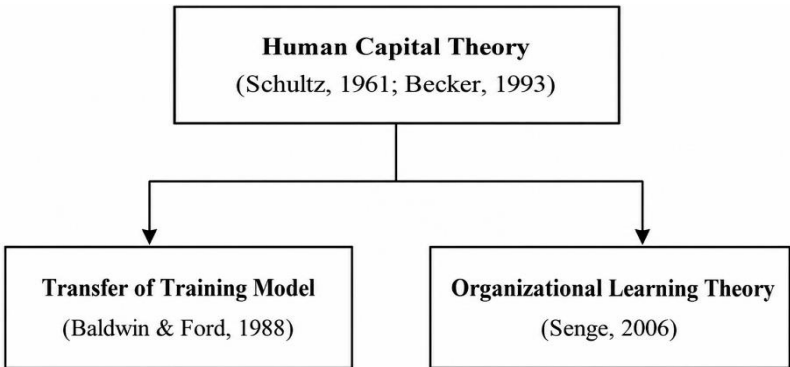


Figure 2. Theoretical Framework Underlying Employee Training & Development

Theoretical Framework

This study is grounded in Human Capital Theory, supported by the Transfer of Training Model and Organizational Learning Theory. Figure 2 illustrates the structural integration of these foundational theories.

Human Capital Theory

Pioneered by Schultz (1961) and expanded by Becker (1993), Human Capital Theory posits that individuals possess skills, knowledge, capabilities, and health that hold measurable economic value for organizations. Education and structured training are viewed as capital investments rather than simple consumption costs (Nafukho *et al.*, 2004). Applying this framework to public and tertiary institutions suggests that investing in employee professional development expands individual human capital reserves, directly enhancing workforce productivity, innovation, and service delivery (Adamu & Ado, 2026; Sung & Choi, 2021).

Transfer of Training Model

Baldwin and Ford (1988) conceptualize training effectiveness through the transfer of training framework, asserting that learning must be effectively applied and maintained on the job. The model indicates that training outcomes depend on a triad of:

- Trainee Characteristics: Motivation, baseline capability, and self-efficacy.
- Training Design: Instructional quality, curriculum relevance, and practical exercises.
- Work Environment: Supervisory support, institutional resources, and transfer climate.

Evaluating these outcomes requires tracking multi-level indicators ranging from respondent reaction to organizational results (Kirkpatrick & Kirkpatrick, 2022; Salas *et al.*, 2012).

Organizational Learning Theory

Senge (2006) emphasizes that organizations must foster continuous learning environments to adapt to complex external changes. Continuous institutional investment in training enhances dynamic capabilities, facilitating institutional knowledge creation, digital integration, and long-term sustainability (Oyekunle *et al.*, 2024; Sung & Choi, 2021).

Hypothesis Development

The conceptualized relationships between employee training, key structural outcomes, and differences across staff cadres are mapped in Figure 3.

Staff Cadres and Perceived Employee Productivity

Empirical literature indicates that continuous training enhances employee productivity through refined technical skills, elevated morale, and improved work efficiency (Salas *et al.*, 2012). However, operational responsibilities, skill applications, and workplace roles vary significantly across job designations (Boyatzis, 1982). Senior executives, middle-cadre administrators, and junior support staff experience different daily workflow demands and performance expectations (Adamu & Ado, 2026; DeCenzo & Robbins, 2021). Consequently, their perception of how training initiatives translate into tangible productivity gains can differ markedly depending on their cadre.

H₀₁: Employee training programmes have no significant impact on employee productivity at ATAP, Bauchi.

Staff Cadres and Perceived Strategic Alignment

Strategic alignment measures the degree to which training programs reflect departmental and institutional objectives (Armstrong, 2022; Kaplan & Norton, 1996). Senior management typically possesses broader institutional vision and strategic overview compared to tactical or operational staff cadres (DeCenzo & Robbins, 2021). While executive cadres evaluate training against overarching policy goals and structural transformation (Sulaiman *et al.*, 2025), lower and middle cadres evaluate training based on immediate operational task performance (Yusof *et al.*, 2023). These divergent perspectives suggest variation in how different staff cadres evaluate strategic alignment.

H₀₂: Employee T&D initiatives are not significantly aligned with the strategic goals of ATAP, Bauchi.

Staff Cadres and Perceived Implementation Challenges

Training execution often encounters barriers such as inadequate funding, limited technical infrastructure, poor needs assessments, and insufficient management backing (Obadahun *et al.*, 2024; Oyekunle *et al.*, 2024). Operational frontline employees frequently experience resource bottlenecks and facility limitations firsthand during routine execution (Grenda, 2026). Conversely, administrative executives observe higher-level budgetary and policy constraints (Sulaiman *et al.*, 2025; Sung & Choi, 2021). Because exposure to systemic and operational constraints varies by organizational level, perceptions of implementation challenges differ across staff hierarchies.

H₀₃: There are no significant challenges affecting the implementation of employee T&D programmes at ATAP, Bauchi.

Methodology

Research Design

This study utilized a quantitative, cross-sectional survey research design to examine the relationship between employee T&D initiatives and operational outcomes across staff cadres (Creswell & Creswell, 2022; Saunders *et al.*, 2023). A cross-sectional approach allowed for the simultaneous collection of data from multiple administrative and academic tiers at a single point in time to evaluate inter-cadre variances in perceived productivity, strategic alignment, and implementation constraints.

Population and Sampling Technique

The target population comprised academic and administrative staff across various departments at ATAP, Bauchi. To ensure proportionate representation across job hierarchies, a stratified random sampling technique was employed (Saunders *et al.*, 2023). Sample size determination was guided by Yamane's (1967) formula

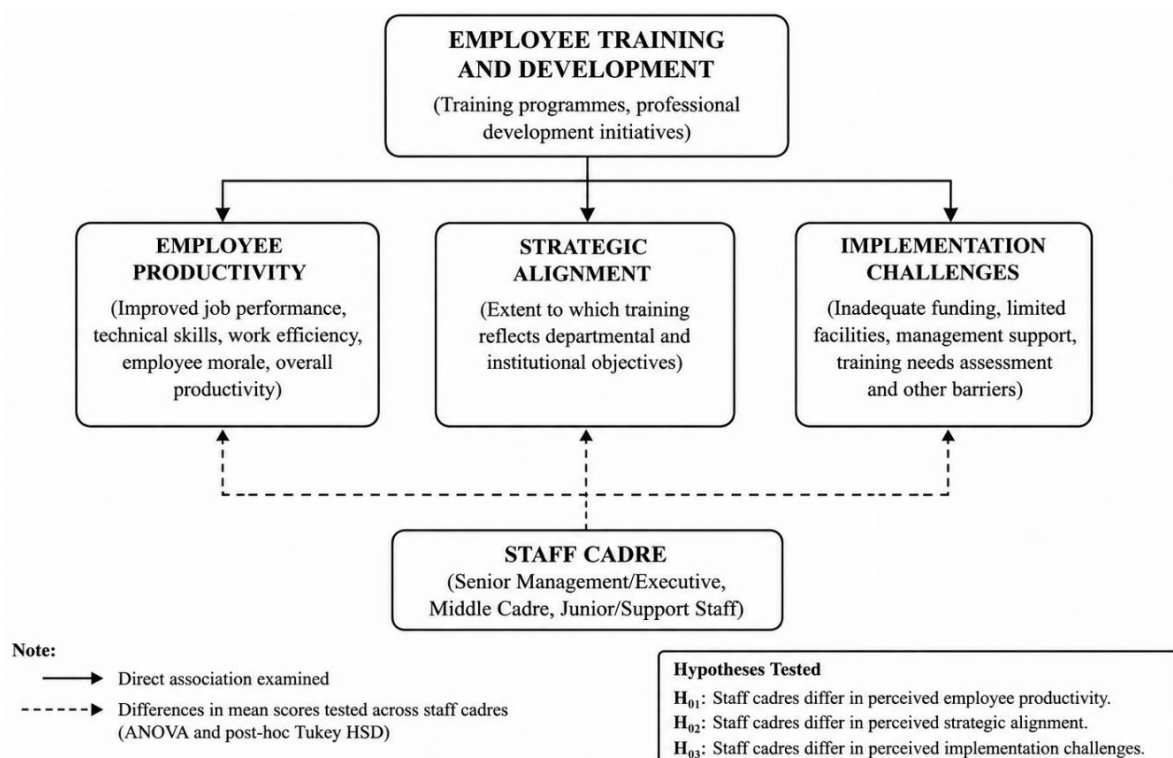


Figure 3: Structural Relationships among Employee T&D, Key Outcomes, and Staff Cadres

for finite populations. A total of 265 copies of the questionnaire were distributed across the institution, of which 250 properly completed copies were retrieved, yielding a valid response rate of 94.3%. As presented in Table 1, the final analyzed sample ($n = 250$) was stratified across three operational cadres: Senior Management/Executive Cadre ($n = 60$, 24.0%), Middle Cadre ($n = 110$, 44.0%), and Junior/Support Staff Cadre ($n = 80$, 32.0%).

Table 1. Sample Distribution Across Staff Cadres

Staff Cadre	Target Designation	Sample Size (n)	Percentage (%)
Senior/Executive Cadre	Senior administrative directors, deans, and heads of academic departments	60	24.0%
Middle Cadre	Middle-level administrative officers, senior lecturers, and technical officers	110	44.0%
Junior/Support Staff Cadre	Frontline junior support staff, laboratory assistants, and routine administrative aides	80	32.0%
Total		250	100.0%

Instrumentation

Primary data were gathered using a structured survey instrument titled the *Employee Training and Organizational Growth Questionnaire (ETOGQ)*. The questionnaire was structured into distinct sub-scales designed to capture respondents' evaluations across key operational constructs. In total, the ETOGQ comprised 15 items distributed equally across three primary sub-scales (5 items per construct):

- *Employee Productivity*: Items assessed post-training improvements in individual job performance, technical skill mastery, work efficiency, employee morale, and overall operational productivity.
- *Strategic Alignment*: Items measured the perceived extent to which training activities reflected departmental objectives and overarching institutional goals.
- *Implementation Challenges*: Items evaluated operational execution barriers, including budgetary shortfalls, facility limitations, management support level, and training needs assessment (TNA) protocols.

Responses were captured using a standardized 5-point Likert scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*).

Validity and Reliability

Content and construct validity of the ETOGQ were established through five-person expert panel review and alignment with validated literature on human resource development and strategic management (Armstrong, 2022; DeCenzo & Robbins, 2021; Noe *et al.*, 2022).

The internal consistency of the measurement instrument was evaluated using Cronbach's Alpha coefficient (α) (Cronbach, 1951) based on pilot data collected from 33 respondents. All sub-scales demonstrated high reliability exceeding the standard statistical benchmark of 0.70: Employee Productivity (5 items, $\alpha = 0.82$),

Strategic Alignment (5 items, $\alpha = 0.79$), Implementation Challenges (5 items, $\alpha = 0.81$), and the overall ETOGQ instrument (15 items, $\alpha = 0.84$).

Data Collection Procedure

The ETOGQ was self-administered directly to selected staff across various academic faculties, directorates, and administrative units at ATAP, Bauchi. Respondents were informed of the research objectives and assured of strict response confidentiality and anonymity. Completed questionnaires were retrieved directly by the researcher over a dedicated collection window, contributing to the high retrieval rate of 94.3% ($n = 250$).

Method of Data Analysis

Data were audited, coded, and analyzed using SPSS statistical software. Both descriptive and inferential statistical techniques (Saunders *et al.*, 2023) were applied to address the research objectives and test hypotheses:

- *Descriptive Statistics*: Frequencies, grand means (M), and standard deviations (SD) were computed to summarize general response tendencies across the major study constructs.
- *Assumption Testing*: Before inferential analysis, data were evaluated for ANOVA parametric assumptions. Normality was confirmed via graphical and numerical procedures, while homogeneity of variance across groups was confirmed using Levene's test ($p > .05$).
- *Inferential Statistics*: One-Way Analysis of Variance (ANOVA) was conducted to evaluate whether statistically significant mean differences existed across the three staff cadres ($df = 2, 247$) at a significance threshold of $\alpha = .05$.
- *Post-Hoc Directional Testing*: Where ANOVA tests indicated significant group differences ($p < .05$), Tukey's Honestly Significant Difference (HSD) post-hoc test was performed to isolate specific pairwise differences between staff cadres.
- *Effect Size Estimation*: Effect sizes for the hypothesis tests were calculated using Eta-squared (η^2) to quantify the magnitude of cadre-based variation across constructs.

Results

Descriptive Statistics of Study Variables

Before testing the hypotheses, descriptive statistics were used to summarize the major study variables. The results in Table 2 showed that employee productivity recorded a grand mean of 3.10, indicating that respondents generally agreed that employee T&D contributed positively to productivity. Strategic alignment recorded a grand mean of 3.00, suggesting that respondents generally perceived T&D initiatives as being aligned with institutional objectives. Implementation challenges recorded a grand mean of 3.10, indicating that respondents also recognized the existence of challenges affecting the effective implementation of T&D programmes.

The mean of 3.10 for employee productivity was based on five questionnaire items addressing improved job performance, technical skills, work efficiency, employee morale, and overall productivity. Strategic alignment, with a mean of 3.00, was based on items addressing the extent to which training activities reflected departmental and institutional objectives. Implementation challenges, which recorded a mean of 3.10, covered issues such as inadequate funding, limited training facilities, management support, and training needs assessment.

Table 2. Descriptive Statistics of Study Variables

Variable	<i>n</i>	Mean	SD
Employee Productivity	250	3.10	0.76
Strategic Alignment	250	3.00	0.78
Implementation Challenges	250	3.10	0.72

Table 3. Reliability Statistics of the Study Instrument

Construct	No. of Items	Cronbach's α
Employee Productivity	5	0.82
Strategic Alignment	5	0.79
Implementation Challenges	5	0.81
Overall Instrument	15	0.84

Reliability of the Measurement Instrument

The *Employee Training and Organizational Growth Questionnaire* (ETOGQ) was subjected to reliability assessment using Cronbach's Alpha. The instrument consisted of items measuring employee productivity, strategic alignment, and implementation challenges. The reliability coefficients presented in Table 3 indicate satisfactory internal consistency because all values exceeded the generally accepted minimum threshold of 0.70.

The Cronbach's α coefficients ranged from 0.79 to 0.82 for the individual constructs, while the overall instrument recorded a coefficient of 0.84. These coefficients indicate that the items within the respective constructs demonstrated satisfactory internal consistency and were sufficiently reliable for the analysis.

Preliminary Analysis and Assumption Testing

Before conducting the One-Way ANOVA, the data were examined to determine their suitability for inferential analysis. To align the comparative analysis, respondents were categorized into three distinct operational cadre groups: Senior Management/Executive Cadre ($n_1 = 60$), Middle Cadre ($n_2 = 110$), and Junior/Support Staff Cadre ($n_3 = 80$), establishing a total sample size of $n = 250$ ($df = 2,247$).

The assumptions underlying ANOVA include independence of observations, approximate normality of the dependent variable within groups, and homogeneity of variance. Normality was assessed using appropriate statistical and graphical procedures, while homogeneity of variance was assessed using Levene's test ($p > .05$ across constructs). The assumption testing indicated that the data were sufficiently appropriate for the application of One-

Way ANOVA. The analysis was conducted to determine whether statistically significant differences existed among the three cadre groups at the 0.05 level of significance, followed by Tukey's Honestly Significant Difference (HSD) post-hoc tests to establish directional differences between group means.

Test of Hypothesis One

H₀₁: *Employee training programmes have no significant impact on employee productivity at ATAP, Bauchi.*

A One-Way ANOVA was conducted to determine whether employee productivity differed significantly among the three staff cadre groups. The result in Table 4 showed a statistically significant difference across groups, $F(2,247) = 4.32, p = .014$.

Since the p -value of 0.014 was less than the 0.05 level of significance, the null hypothesis was rejected. The result indicates that there was a statistically significant difference in employee productivity among the staff cadres. The eta-squared effect size was $\eta^2 = 0.034$, indicating a small effect size. Post-hoc Tukey HSD comparisons revealed that Senior Cadre staff reported significantly higher perceived productivity improvements following training ($M = 3.48, SD = 0.71$) compared to Junior Staff ($M = 2.81, SD = 0.78, p = .011$). Differences between Senior and Middle cadres ($M = 3.10$), as well as Middle and Junior cadres, were not statistically significant.

Test of Hypothesis Two

H₀₂: *Employee T&D initiatives are not significantly aligned with the strategic goals of ATAP, Bauchi.*

A One-Way ANOVA was conducted to determine whether respondents' perceptions of strategic alignment differed significantly among the three staff cadres. The result in Table 5 showed a statistically significant difference, $F(2,247) = 3.65, p = .028$. Since the p -value was less than 0.05, the null hypothesis was rejected. This indicates that perceptions of strategic alignment differed significantly across institutional cadres ($\eta^2 = 0.029$). Post-hoc directional comparisons using Tukey's HSD indicated that Senior Cadre respondents perceived a higher strategic alignment between training programs and institutional objectives ($M = 3.32, SD = 0.72$) than Junior Cadre respondents ($M = 2.76, SD = 0.81, p = .022$).

Table 4. One-Way ANOVA and Group Directional Statistics for Employee Productivity

Source of Variation/ Cadre Group	Sample (<i>n</i>)	Mean (<i>SD</i>)	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i> - value	Post-Hoc Directional Result (Tukey HSD)
Between Groups	—	—	15.24	2	7.62	4.32	0.014	Senior > Junior ($p = .011$)
Within Groups	—	—	438.10	247	1.77	—	—	Senior vs. Middle ($p = .124$)
Total	250	3.10 (0.76)	453.34	249	—	—	—	Middle vs. Junior ($p = .215$)
<i>Group 1: Senior Cadre</i>	60	3.48 (0.71)	—	—	—	—	—	—
<i>Group 2: Middle Cadre</i>	110	3.10 (0.74)	—	—	—	—	—	—
<i>Group 3: Junior Cadre</i>	80	2.81 (0.78)	—	—	—	—	—	—

Table 5. One-Way ANOVA and Group Directional Statistics for Strategic Alignment

Source of Variation/ Cadre Group	Sample (<i>n</i>)	Mean (<i>SD</i>)	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i> - value	Post-Hoc Directional Result (Tukey HSD)
Between Groups	—	—	10.87	2	5.44	3.65	0.028	Senior > Junior ($p = .022$)
Within Groups	—	—	368.52	247	1.49	—	—	Senior vs. Middle ($p = .185$)
Total	250	3.00 (0.78)	379.39	249	—	—	—	Middle vs. Junior ($p = .310$)
<i>Group 1: Senior Cadre</i>	60	3.32 (0.72)	—	—	—	—	—	—
<i>Group 2: Middle Cadre</i>	110	3.00 (0.76)	—	—	—	—	—	—
<i>Group 3: Junior Cadre</i>	80	2.76 (0.81)	—	—	—	—	—	—

Table 6. One-Way ANOVA and Group Directional Statistics for Implementation Challenges

Source of Variation/ Cadre Group	Sample (<i>n</i>)	Mean (<i>SD</i>)	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i> - value	Post-Hoc Directional Result (Tukey HSD)
Between Groups	—	—	22.73	2	11.37	5.90	0.003	Senior > Junior (<i>p</i> = .002)
Within Groups	—	—	476.12	247	1.93	—	—	Senior vs. Middle (<i>p</i> = .041)
Total	250	3.10 (0.72)	498.85	249	—	—	—	Middle vs. Junior (<i>p</i> = .142)
<i>Group 1: Senior Cadre</i>	60	2.63 (0.68)	—	—	—	—	—	—
<i>Group 2: Middle Cadre</i>	110	3.10 (0.70)	—	—	—	—	—	—
<i>Group 3: Junior Cadre</i>	80	3.45 (0.73)	—	—	—	—	—	—

Table 7. Summary of Hypothesis Testing

Hypothesis	<i>F</i> -value	<i>df</i>	<i>p</i> -value	η^2	Post-Hoc Directional Summary	Decision
H ₀₁	4.32	2, 247	0.014	0.034	Senior Cadre > Junior Cadre (<i>p</i> = .011)	Reject H ₀
H ₀₂	3.65	2, 247	0.028	0.029	Senior Cadre > Junior Cadre (<i>p</i> = .022)	Reject H ₀
H ₀₃	5.90	2, 247	0.003	0.046	Junior & Middle Cadres > Senior Cadre (<i>p</i> < .050)	Reject H ₀

Test of Hypothesis Three

H₀₃: *There are no significant challenges affecting the implementation of employee T&D programmes at ATAP, Bauchi.*

A One-Way ANOVA was conducted to determine whether perceptions of implementation challenges differed significantly among the three cadre groups. The result in Table 6 showed a statistically significant difference, $F(2,247) = 5.90, p = .003$.

Since the *p*-value was less than 0.05, the null hypothesis was rejected ($\eta^2 = 0.046$). Post-hoc Tukey HSD analysis demonstrated a clear inverse directional trend: Junior Cadre staff ($M = 3.45, SD = 0.73$) and Middle Cadre staff ($M = 3.10, SD = 0.70$) perceived significantly greater operational implementation challenges—such as inadequate funding and limited facility access—than Senior Management staff ($M = 2.63, SD = 0.68, p < .05$).

Summary of Hypothesis Testing

The results in Table 7 show that all three null hypotheses were rejected at the 0.05 level of significance. Employee training programmes were associated with significant differences in employee productivity, T&D initiatives showed significant differences in perceived strategic alignment, and significant differences were also observed in perceptions of implementation challenges. While the overall eta-squared values indicate modest effect sizes ($\eta^2 = 0.029$ – 0.046), post-hoc testing confirms consistent cadre-based directional variations across all constructs.

Discussion

Overview of Findings

The objective of this study was to evaluate the impact of employee T&D initiatives on organizational growth at ATAP, Bauchi, across three core operational dimensions: employee productivity, strategic alignment, and implementation challenges. The empirical analysis ($n = 250$) resulted in the statistical rejection of all three null hypotheses ($p < .05$). To explain these results, the discussion is anchored in the theoretical triad conceptualized in Figure 2—synthesizing Human Capital Theory (macro-level investment), the Transfer of Training Model (micro-level execution), and Organizational Learning Theory (meso-level alignment). This framework accounts for why T&D positively influences institutional performance overall, while explaining why perceptions of productivity gains, strategic goal alignment, and operational constraints vary significantly across staff cadres.

Impact of Training on Employee Productivity (H₀₁)

The rejection of the first hypothesis ($F(2,247) = 4.32, p = .014, \eta^2 = 0.034$) demonstrates that T&D programs yield statistically significant, cadre-differentiated impacts on perceived productivity. At the macro level, this finding directly validates Human Capital Theory (Schultz, 1961; Becker, 1993; Nafukho *et al.*, 2004), which posits that deliberate investments in workplace learning expand individual skill reserves and performance capacity. The grand mean of 3.10 reflects baseline institutional consensus that training improves work efficiency and technical capabilities, corroborating findings by Adamu and Ado (2026), Obadahun *et al.* (2024), and Yusuf *et al.* (2023).

However, the post-hoc directional divergence—where Senior Cadre staff reported significantly higher productivity gains ($M = 3.48, SD = 0.71$) than Junior Cadre staff ($M = 2.81, SD = 0.78, p = .011$)—is explained by the micro-level mechanics of the Transfer of Training Model (Baldwin & Ford, 1988; Kirkpatrick & Kirkpatrick, 2022). Senior executives undergo leadership and managerial development (Boyatzis, 1982; Noe *et al.*, 2022) within work environments characterized by high operational autonomy and decision-making authority. Conversely, junior support staff face severe transfer constraints—such as rigid task boundaries, lack of discretion, and post-training resource shortfalls—which impede their ability to convert acquired competencies into observable productivity gains (DeCenzo & Robbins, 2021; Grenda, 2026).

Strategic Alignment of Training Initiatives (H₀₂)

The analysis for second hypothesis ($F(2,247) = 3.65, p = .028, \eta^2 = 0.029$) confirms significant inter-cadre variance regarding how effectively training programs align with institutional goals. Grounded in Organizational Learning Theory (Senge, 2006) and Strategic Human Resource Management (Armstrong, 2022; Kaplan & Norton, 1996), training yields optimal returns only when embedded within a shared institutional vision rather than conducted as isolated administrative exercises (Salas *et al.*, 2012; Sung & Choi, 2021).

The post-hoc gap between Senior Management ($M = 3.32, SD = 0.72$) and Junior Staff ($M = 2.76, SD = 0.81, p = .022$) highlights a breakdown in organizational learning loops and strategic communication. Senior administrators, involved in institutional governance and TETFund intervention planning (Sulaiman *et al.*, 2025), possess clear visibility into how training fits overarching goals. In contrast, lower-level operational staff are excluded from strategic goal-setting processes, resulting in a perceptual disconnect where training is experienced as a transactional activity rather than a driver of institutional growth (Oyekunle *et al.*, 2024; Sung & Choi, 2021).

Implementation Challenges in Institutional Training (H_{03})

The third hypothesis yielded the strongest statistical effect ($F(2,247) = 5.90, p = .003, \eta^2 = 0.046$), revealing an inverse directional trend where Junior ($M = 3.45, SD = 0.73$) and Middle Cadres ($M = 3.10, SD = 0.70$) reported significantly greater operational bottlenecks than Senior Management ($M = 2.63, SD = 0.68, p < .05$).

This disparity is directly accounted for by the work environment dimension of the Transfer of Training Model (Baldwin & Ford, 1988). While macro-funding mechanisms like TETFund sponsor capacity building (Sulaiman *et al.*, 2025), frontline implementation remains constrained by budgetary shortfalls, obsolete workshop equipment, flawed Training Needs Assessments (TNA), and selection bias (Adamu & Ado, 2026; Obadahun *et al.*, 2024; Oyekunle *et al.*, 2024). Frontline junior and middle staff encounter these execution constraints directly during daily operations (Yusof *et al.*, 2023), whereas senior executives, removed from routine technical execution, perceive these implementation hurdles less acutely (Salas *et al.*, 2012).

Synthesis and Implications for Organizational Growth

Synthesizing these findings through the theoretical triad demonstrates that employee T&D serves as a vital engine for organizational growth, but its impact is attenuated by implementation friction and lower-cadre misalignment ($\eta^2 = 0.029\text{--}0.046$).

- Human Capital Theory establishes the foundational imperative for investing in workforce skills.
- The Transfer of Training Model pinpoints the micro-level operational and environmental barriers that restrict skill application among frontline staff.
- Organizational Learning Theory supplies the architecture needed to eliminate top-down communication deficits and build shared strategic purpose.

To achieve sustainable growth, ATAP must transition to an integrated, inclusive development model (Armstrong, 2022; Senge, 2006) by:

1. Implementing participatory, cadre-specific Training Needs Assessments (TNA) (Salas *et al.*, 2012; Yusof *et al.*, 2023).
2. Modernizing technical learning infrastructure and post-training transfer resources (Grenda, 2026; Oyekunle *et al.*, 2024).
3. Transparently communicating strategic institutional goals to lower-tier personnel to foster shared organizational learning (Kaplan & Norton, 1996; Senge, 2006).

Contributions of the Study

Theoretical Contribution

This study contributes to the literature on organizational behavior and Strategic Human Resource Management (SHRM) by extending the application of Human Capital Theory (Schultz, 1961; Becker, 1993) within the public tertiary education context in developing economies. While traditional human capital models assume a direct linear conversion of training investments into productive capacity, this study demonstrates that returns on human capital are structurally conditional. By synthesizing Human Capital Theory with Baldwin and Ford's (1988) transfer of training framework and Kaplan and Norton's (1996) Balanced Scorecard,

the study establishes that human capital accumulation yields cadre-differentiated outcomes. It reveals that learning transfer and strategic alignment are heavily moderated by an employee's structural position, operational autonomy, and post-training resource availability within the institutional hierarchy.

Empirical and Contextual Contribution

Empirically, the study provides institution-specific evidence on the operational dynamics of employee training and organizational growth within Nigerian public polytechnics—a sector underrepresented in empirical literature compared to commercial enterprises and university systems. By evaluating $n = 250$ academic and administrative staff across three distinct hierarchical tiers at ATAP, Bauchi, the study uncovers an empirical paradox: while senior management reports higher productivity gains ($M = 3.48$) and strategic alignment ($M = 3.32$), junior ($M = 3.45$) and middle ($M = 3.10$) cadres bear the burden of operational implementation challenges. This granular, post-hoc directional insight challenges broad assumptions regarding uniform training efficacy in public sector governance.

Methodological Contribution

Methodologically, the study advances the evaluation of institutional training programs by combining One-Way ANOVA with Tukey's Honestly Significant Difference (HSD) post-hoc directional testing across stratified administrative and academic staff cadres ($n_1 = 60, n_2 = 110, n_3 = 80$). Rather than relying on aggregated sample means, which risk masking structural inequalities, this multi-tiered analytical design isolates specific inter-cadre variances in perceived productivity, goal alignment, and operational bottlenecks. This offers a methodological framework for future organizational assessments in hierarchical tertiary institutions.

Practical and Managerial Contribution

Practically, the findings offer actionable policy insights for polytechnic administrators, human resource managers, and intervention bodies such as the Tertiary Education Trust Fund (TETFund). The study demonstrates that allocating financial resources for training is insufficient if operational support for lower-tier staff remains constrained. It provides management with empirical justification to transition from ad-hoc, top-down training distribution to participatory Training Needs Assessments (TNA), transparent strategic communication, and targeted post-training resource deployment.

Limitations of the Study

The findings of this study should be interpreted within the context of several inherent methodological and contextual limitations:

1. *Cross-Sectional Research Design:* The study utilized a cross-sectional survey design, capturing data at a single point in time. Consequently, while the analysis established significant inter-group variances and associations, it cannot definitively prove long-term causal effects or temporal trajectories of training on institutional growth.
2. *Single-Institution Scope:* The empirical investigation was geographically and institutionally restricted to ATAP, Bauchi. Institutional governance, resource allocations, regional dynamics, and administrative structures may differ in federal

polytechnics or private tertiary institutions, thereby limiting direct generalizability across all higher education contexts.

3. *Reliance on Perceptual Data:* Primary data collection relied on self-reported questionnaire responses (ETOGQ) from staff members. Perceptions of productivity, strategic alignment, and operational constraints are subject to individual respondent bias, career position, and subjective recall, rather than direct objective institutional Key Performance Indicators (KPIs) such as audited administrative response times or standardized peer-reviewed outputs.
4. *Modest Statistical Effect Sizes:* Although all three null hypotheses were rejected at $p < .05$, the observed eta-squared values ranged from small to modest ($\eta^2 = 0.029\text{--}0.046$). This indicates that employee training accounts for only a small portion of variance in organizational growth, implying that unexamined exogenous and endogenous factors play substantial roles.

Recommendations

Based on the empirical findings, post-hoc directional analyses, and theoretical synthesis, the following recommendations are presented for the management of ATAP and higher education policy stakeholders:

1. *Institutionalize Participatory, Cadre-Specific Training Needs Assessments (TNA):* Management should abolish top-down, blanket training allocations and institute structured pre-training assessments. TNAs must actively engage junior and middle-cadre staff to identify precise technical skill deficits and operational needs before programs are scheduled.
2. *Enhance Post-Training Transfer Resources for Frontline Staff:* To eliminate the productivity bottleneck observed among junior personnel ($M = 2.81$), management must complement training interventions with modern workshop tools, digital facilities, updated administrative software, and clear task autonomy to facilitate learning transfer.
3. *Bridge Strategic Communication Gaps Across Hierarchical Tiers:* The Polytechnic leadership should establish transparent communication channels to cascade institutional strategic goals and TETFund project targets down to lower-level operational units. Aligning frontline duties with broad institutional growth fosters a shared sense of mission.
4. *Establish Multi-Level Training Evaluation Frameworks:* The institution should move beyond evaluating training solely by attendance records. Adopting structured evaluation tools (such as Kirkpatrick's four-level model) will allow management to monitor behavioral changes on the job and measure actual performance improvements.
5. *Address Operational Implementation Constraints:* Polytechnic authorities and funding bodies should prioritize funding allocation for modern learning infrastructure, digital technologies, and transparent sponsorship selection processes to mitigate the severe implementation obstacles identified by frontline personnel.

Conclusion

This study examined the impact of employee T&D on organizational growth at ATAP, Bauchi, focusing on employee productivity, strategic alignment, and implementation challenges. By anchoring the inquiry in Human Capital Theory and evaluating data across staff cadres ($n = 250$), the empirical results confirmed

that structured training initiatives are fundamental drivers of institutional effectiveness ($p < .05$).

However, the empirical evidence demonstrates that the transformation of training investments into institutional growth is neither automatic nor uniform. Senior management experiences higher perceived productivity gains and clearer strategic alignment due to decision-making authority and executive visibility. Conversely, junior and middle support staff face pronounced operational constraints, rigid work structures, and resource limitations that hinder skill transfer. Ultimately, employee training constitutes a vital strategic investment, but its ultimate contribution to sustainable organizational growth depends on inclusive strategic communication, equitable resource provision, and systematic post-training support across all administrative and academic tiers.

Suggestions for Further Studies

To build upon the empirical baseline established in this study, future research should explore the following avenues:

1. *Multi-Institutional Comparative Studies:* Future researchers should expand the geographical and institutional scope by conducting comparative studies across federal, state, and private polytechnics across Nigeria's six geopolitical zones to test for ownership, funding, and regional moderation effects.
2. *Longitudinal and Quasi-Experimental Research Designs:* Scholars should adopt longitudinal panel designs or pre-test/post-test experimental frameworks to track employees over extended periods, assessing the sustained impact of training investments on productivity and career progression.
3. *Integration of Objective Performance Indicators:* Subsequent studies should combine perceptual survey data with objective quantitative indicators, such as student completion rates, institutional accreditation scores, peer-reviewed research output, and official administrative turnaround logs.
4. *Advanced Structural Equation Modeling (SEM):* Future research should formulate and test comprehensive structural frameworks incorporating organizational culture, leadership styles, employee motivation, job satisfaction, and reward mechanisms as mediating or moderating variables between training investments and organizational growth.

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