

Effect of in-service training on employees' performance in ministry of works, Plateau State

By

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Abstract

In-service training is a vital strategy for enhancing employee performance in public sector organizations, particularly in infrastructure-driven institutions like the Ministry of Works, Plateau State, Nigeria. This study examined the effect of in-service training on employee performance, focusing on three dimensions as seen in training methods, training quality, and training evaluation and feedback. Employee performance was measured through task completion rate, quality of work output, and goal achievement. A cross-sectional survey design was employed, with data collected from 82 staff members of the Ministry of Works in Jos using a structured questionnaire and a census sampling technique. Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to analyse the data, revealing that training methods ($\beta = 0.164$, $p = 0.011$), training quality ($\beta = 0.223$, $p = 0.006$), and training evaluation and feedback ($\beta = 0.257$, $p < 0.001$) significantly affect employee performance, collectively explaining 68% of its variance ($R^2 = 0.680$). This study concluded that a well-resourced, training system with effective methods and evaluation mechanisms is vital for improving employee efficiency, work quality, and goal attainment, despite challenges like limited budgets and inconsistent training schedules. This study therefore recommended adopting diverse training methods, enhancing training quality through relevant content and skilled trainers, and implementing robust evaluation and feedback systems to boost employee performance in the Ministry of Works, Plateau State.

Keywords: Employee Performance, In-service training, Training Evaluation and Feedback, Training Quality

Introduction

Employee performance is a fundamental pillar of success for any organization, serving as a direct indicator of its efficiency, effectiveness, and productivity. This is especially true for public sector institutions, such as the Ministry of Works, which rely on a skilled workforce to deliver essential services and achieve key policy objectives. Globally, A highly performing workforce is not only more productive but also more innovative and better equipped to meet institutional goals (Obodozie & Nwabufo, 2025; Lima et al., 2025). This performance is largely shaped by the continuous development of employees through effective in-service training. In-service training has emerged as a pivotal strategy for enhancing employee performance by equipping workers with relevant skills, knowledge, and adaptability to meet evolving organizational demands (Mustafa-Sadiku, 2025; Yimam, 2022).

According to Obeng-Tuaah (2025), organizations that invest in structured training programs achieve higher productivity, as trained employees contribute to improved efficiency and organizational competitiveness. In global context, in-service training significantly enhances employee performance across diverse countries, with studies highlighting its impact in top nations and beyond. In Turkiye, in-service training boosts bank employees' skills, knowledge, and productivity, ensuring compliance with technology and regulations,

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enhancing customer satisfaction, and driving organizational success (Cetinkaya, 2024). In Italy, mandatory in-service teacher training improves skills and teaching practices but lacks a unified evaluation model, limiting impact assessment (Agrati, 2021). In India, soft skills training enhances employee knowledge and work performance in service sectors, supporting organizational growth (Deshpande & Munshi, 2022). Similarly, Kenya's Okumu et al. (2018) highlight how training resources improve judicial staff performance despite financial and time constraints. In Ethiopia, Giday and Perumal (2023) show training needs assessment and resource availability enhance teacher performance, though evaluation processes are inadequate. Bangladesh's Karim et al. (2019) demonstrate that regular on-the-job training improves job satisfaction and productivity, while Libya's Eljali et al. (2020) confirm resources mediate training's positive effect on private firm performance.

In Nigeria, in-service training is critical for public sector institutions like the Ministry of Works, Plateau State, where employees are responsible for delivering infrastructure projects that drive socio-economic development. Oyelude (2023) found that well-resourced training programs in Nigeria's public sector foster employee initiative and productivity, contributing to organizational goals. Regular training sessions, as highlighted by Mustafa-Sadiku (2025), improve employees' technical and administrative skills, enabling them to adapt to changing construction standards and government policies. Furthermore, high-quality training methods, such as on-the-job mentoring and off-the-job workshops, enhance skill application and reduce workplace errors (Nzimakwe & Utete, 2024). Training evaluation and feedback mechanisms are equally vital, as they ensure that training programs align with organizational objectives and address employee needs (Ateya & Maende, 2018).

The choice of training methods, whether on-the-job coaching or off-the-job seminars, directly influences skill acquisition and application, as noted by Twongyeirwe et al. (2024). Moreover, training quality, encompassing relevant content and effective delivery, enhances employee confidence and productivity (Ugbaka et al., 2021). Finally, systematic evaluation and feedback, as emphasized by Masinde and Maket (2024), ensure that training outcomes align with the ministry's objectives, such as timely project delivery and high-quality infrastructure outputs. However, challenges such as limited training budgets, irregular training schedules, outdated methods, poor training quality, and inadequate evaluation systems can hinder employee performance in Nigeria's public sector. Okumu et al. (2018) noted that resource constraints in Kenya's public sector limited training effectiveness, a challenge likely mirrored in the Ministry of Works due to budgetary and operational demands.

Low-quality training programs, lacking relevance or expert facilitation, result in minimal performance gains (Shubhi et al., 2025). Additionally, the absence of robust evaluation mechanisms limits the ability to assess training effectiveness, as noted by Cinjel and Audu (2023), potentially undermining the ministry's capacity to deliver on its mandate. This study, therefore, examines the effect of in-service training on employees'

performance at the Ministry of Works, Plateau State, Nigeria, focusing on training methods, quality, and evaluation and feedback influence task completion rate and quality of work output.

The Ministry of Works, Plateau State, plays a pivotal role in executing infrastructure projects, such as road construction, building maintenance, and urban planning, which require a highly skilled and motivated workforce. Regarding policy, the study offers significant implications by providing evidence-based recommendations to government agencies and institutional decision-makers. Its findings inform the development and implementation of policies aimed at strengthening human resource practices, enhancing employee skills, and improving organizational productivity. Specifically, it supports efforts to design effective in-service training frameworks that promote innovation, adaptability, and excellence in Nigeria's public sector, ensuring that entities like the Ministry of Works contribute effectively to national development.

Statement of the Problem

Improving public service delivery remains a priority for the government of Plateau State, but its success hinges on a skilled and efficient workforce within key institutions like the Ministry of Works. Employee performance in this sector is often hindered by issues such as outdated skills, limited access to modern tools, and a lack of continuous professional development, which can lead to inefficiencies in project execution, poor work quality, and failure to meet departmental goals. While numerous studies (e.g., Ugwu, 2019; Yimam, 2022; Asamani et al., 2025; Mustafa-Sadiku, 2025; Giday & Perumal, 2023; Twongyeirwe et al., 2024) have explored the relationship between in-service training and employee performance, several gaps remain specific to the Ministry of Works, Plateau State.

Much of the existing research focuses on private sector organizations or educational institutions, with limited attention to public sector bodies responsible for technical and infrastructural mandates, such as the Ministry of Works. Second, these studies often examine training variables in isolation, failing to adopt an integrated approach that considers the combined effects of training resource availability, frequency, methods, quality, and evaluation on performance. Given the Ministry of Works' critical role in driving infrastructural development in Plateau State, there is a pressing need to investigate how these training-related factors training resource availability, training frequency, training methods, training quality, and training evaluation and feedback collectively affect employee performance, as measured by task completion rate, quality of work output, and goal achievement.

Research Questions

This study is guided by the following research questions:

- i. In what ways do training methods impact employees' performance at the Ministry of Works, Plateau State?

- ii. How does the quality of training influence employees' performance at the Ministry of Works, Plateau State?
- iii. What effect do training evaluation and feedback have on employees' performance at the Ministry of Works, Plateau State?

Research Hypotheses

The study tested the following null hypotheses:

- H₀₁:** Training methods have no significant impact on employees' performance at the Ministry of Works, Plateau State.
- H₀₂:** Training quality has no significant effect on employees' performance at the Ministry of Works, Plateau State.
- H₀₃:** Training evaluation and feedback have no significant effect on employees' performance at the Ministry of Works, Plateau State.

Literature Review

Conceptual Framework

Employee Performance

Employee performance is the tangible contribution of individuals towards organizational objectives, driven by their skills and conduct. According to Adefope (2017), employee performance is a concept that is measurable as a contribution that employees make towards achieving an organization's goals, which is assessed against standards like accuracy, cost, speed, and completeness. Performance reflects the actual behaviour and conduct demonstrated by employees, which is evaluated based on the outcomes they produce in their roles within the organization (Dogbe et al., 2024). Employee performance is also considered the degree of productivity, efficiency, and effectiveness demonstrated by an employee in fulfilling their assigned responsibilities, reflecting how well they meet or surpass organizational expectations (Aguinis, 2023). This includes the tangible outcomes of their work and the manner in which they conduct themselves within the organizational context.

Expanding on this, performance can be broadly conceptualized as the degree to which an individual, a team, or an entire organization achieves its predetermined objectives (David, 2022). Taiwo et al. (2021) further elaborated on this by defining employee performance as the positive impact made on an organization's output and predefined targets, which results from the level of exposure and development opportunities provided to employees. Employee performance refers to the activities and actions undertaken by a worker in their role (Mohamed et al., 2025). It is a multifaceted construct comprising several key elements, including the utility of their work, the amount and quality of their output, their attendance at work, and their overall helpful attitude towards colleagues and the organization (Akerele et al., 2024).

This study defined employee performance as the extent to which employees effectively achieve organizational objectives through timely task completion, high-quality work output, and the attainment of predefined goals, often enhanced by skills from training.

In-service Training

In-service training is a systematic learning process designed to enhance employee skills and knowledge for improved job performance. According to Ugwu (2019), in-service training is a structured learning process designed to enhance employees' skills, knowledge, and attitudes to improve job performance. It involves job-related activities aimed at increasing productivity and adapting to organizational changes. Olatoye et al. (2024) emphasized that effective training methods, like on-the-job training, align with organizational goals, improving performance and reducing skill gaps. Mustafa-Sadiku (2025) explained that continuous training enhances employee performance by improving productivity and job satisfaction.

Hussain et al. (2023) explored how organizational learning capability moderates the relationship between training and development and organizational performance. The study highlighted that structured training enhances employee skills, fostering a learning culture that boosts performance. For example, team-oriented training improved group learning, indirectly enhancing organizational outcomes. Fegade and Sharma (2023) explained that training and development significantly enhance organizational efficiency by improving employee skills and reducing turnover. For instance, companies implementing structured training programs saw a 20% increase in productivity. This underscores the need for tailored training to align with organizational goals. Vu et al. (2023) described training effectiveness as the degree to which training objectives enhance job performance and organizational outcomes. The study explored factors like training content and motivation, using a mixed-methods approach with 370 civil servants in Hanoi. It found dissatisfaction due to poor preparation, recommending needs-based training design.

This study defined in-service training as structured, job-related learning activities provided to employees during their employment to enhance skills, knowledge, and attitudes, thereby improving their performance and adaptability to organizational changes within the Ministry of Works, Plateau State.

Training Methods

Training methods are the systematic processes and techniques used to impart knowledge and skills to employees for improved job performance. According to Siddiqui (2018), training methods are structured approaches, such as on-the-job and off-the-job training, designed to enhance employee skills and improve performance. Mziray and Rwabishugi (2021) also described training methods as structured approaches like on-the-job and off-the-job training to enhance employee skills. In a similar vein, Huang and Jao (2016) defined training methods as structured approaches like on-the-job and off-the-job training to enhance employee skills. The activities that impart knowledge and skills to enhance employee performance should be defined as training methods (Twongyeirwe et al., 2024).

The significance of different training methods in influencing employee performance should be emphasized. A study by Twongyeirwe et al. (2024) found that on-the-job training methods, such as mentoring, showed a strong correlation with employee performance, unlike less effective lectures. For the Ministry of Works, Plateau State, this would suggest that methods involving direct application of skills, like having a senior engineer mentor a junior staff member on a project site or using job rotation to expose employees to different departments, would be more effective than simply holding theoretical lectures in a conference room as emphasized by Adelugba and Ajayi (2017). Siddiqui (2018) also emphasized that effective training methods, such as mentoring or workshops, significantly enhance employee performance. The study recommended that organizations diversify their methods to address specific skill gaps and maximize productivity. This idea of tailoring training to the specific needs of an organization and its employees is also important for the Ministry of Works, where the skills required for different roles, such as road construction, architecture, or administrative support, are diverse and require different approaches to training.

According to Orimuo et al. (2023), on-the-job training, such as mentoring and job rotation, significantly improved employee performance in the Enugu Electricity Distribution Company. This is a powerful example of how hands-on training can be particularly effective in a technical or public utility setting. Similarly, Agufana (2022) explained that on-the-job training significantly enhances employee job satisfaction by reducing monotony and improving skills. The study found that mentorship and coaching foster job satisfaction by aiding career advancement and problem-solving, and that induction programs helped employees adapt quickly, which provides a model for effective training strategies. These findings suggest that on-the-job training not only improves performance but also contributes to a positive work environment, which can be an important factor for morale and retention within a government ministry.

This study defined training methods as the structured on-the-job and off-the-job techniques, such as coaching, job rotation, and seminars, used by the Ministry of Works, Plateau State, to deliver in-service training and enhance employee performance.

Training Quality

High-quality training ensures effective programs that provide relevant skills and knowledge, directly improving employee performance. Ugbaka et al. (2021) defined training quality as the effectiveness of training programs in equipping employees with relevant skills and knowledge. Similarly, training quality refers to the perceived effectiveness and relevance of the training programs offered by an organization (Ahmed, 2024; Adeyemo et al., 2024). Training quality also refers to the extent to which training content, delivery methods, and facilitators effectively meet learning objectives and improve job performance (Shubhi et al., 2025). Mustafa-Sadiku (2025) defined training quality as the effectiveness and relevance of structured programs that enhance employee skills.

According to Kosovare Mustafa-Sadiku (2025), training quality refers to the degree to which a program's content, delivery, and relevance meet organizational and employee performance needs. This highlights that training quality is not a single factor but a combination of elements that work together to create a valuable learning experience. High-quality training ensures that the content is engaging, the delivery methods are effective, and the outcomes are beneficial for both the employees and the organization (Bęś & Strzałkowski, 2024).

Lee (2024) demonstrated that high-quality training programs lead to higher job satisfaction and lower turnover rates in the healthcare industry. In the insurance sector, providing high-quality training can help employees better understand complex products and regulatory requirements, thereby improving their performance and reducing job-related stress (Nguyen, 2024). These findings are highly relevant to the Ministry of Works, Plateau State, as they suggest that a high-quality in-service training program would not only improve employee skills but also foster loyalty and reduce the likelihood of employees leaving their roles.

This study defined training quality as the effectiveness, relevance, and instructional design of in-service training programs, encompassing the content, trainer expertise, and delivery methods to ensure employees in the Ministry of Works, Plateau State, acquire practical skills that enhance performance and productivity.

Training Evaluation and Feedback

Training evaluation and feedback systematically assess training effectiveness to improve employee performance and align with organizational goals. This process is particularly relevant to the Ministry of Works, Plateau State, as it helps determine if in-service training programs are yielding desired results. According to Masinde and Maket (2024), training evaluation is a systematic procedure to appraise the effectiveness of training programs, with a focus on diagnostic and formative methods.

Kishore and Fonceca (2023) confirmed that effective training evaluation significantly improves employee performance, as evidenced in a paper manufacturing firm where systematic evaluation increased productivity. They suggest that feedback on the clarity of training content can improve skill application. Omusebe et al. (2019) explained that regular evaluation helps identify skill gaps, which boosts productivity in Kenyan firms. Similarly, Afshan et al. (2021) stated that feedback is instrumental in refining training for telecom employees. Ateya and Maende (2018) also noted that effective evaluation, such as the Kirkpatrick model, ensures skill transfer, which in turn enhances employee commitment and organizational outcomes.

This study defined training evaluation and feedback as the systematic process of assessing the outcomes of in-service training programs to determine their effectiveness in improving employee performance and aligning with organizational goals.

Relationship Between In-service Training and Employee Performance

Independent Variable

Dependable Variable

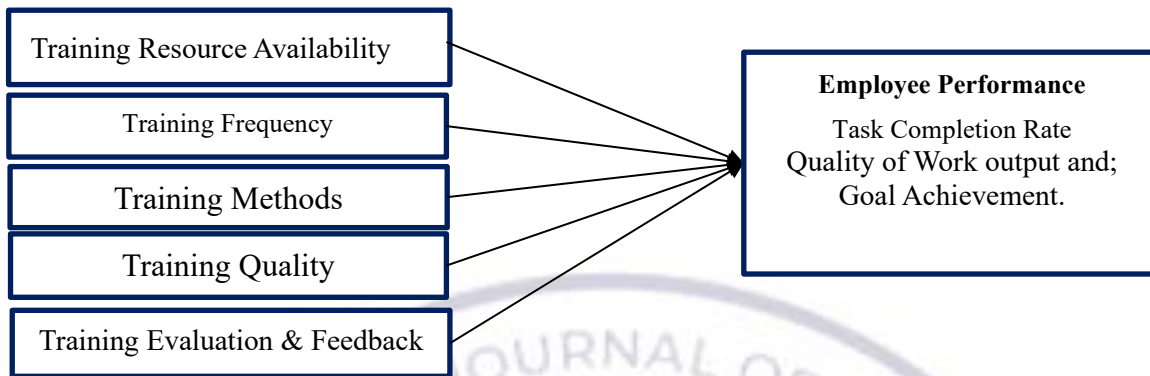


Fig. 2.1: Researcher's Conceptual Model Design (2025).

Empirical Review

Saleh and Azimi (2025) examined the impact of training and development on employee performance and productivity at JACK NGO in Parwan, Afghanistan. The study explored variables such as on-the-job training, employee skills, and organizational outcomes. Employing a quantitative methodology, it used linear regression analysis on data collected from 275 participants via structured questionnaires, supplemented by secondary sources. The findings confirmed a significant positive relationship between training and development initiatives, particularly on-the-job training, and enhanced employee performance and productivity. The study recommended strategic investments in comprehensive training programs to align with organizational goals and foster sustainable growth. Its strength lay in its robust sample size and rigorous statistical analysis, providing reliable insights specific to the NGO context. However, the study's focus on a single organization limits its generalizability, and the reliance on self-reported data may introduce bias, potentially overlooking external factors affecting performance.

Adaobi and Owusu-Konadu (2022) examined employees training and development on organizational performance, exploring the relationship between training methods, employee performance, and organizational productivity. The study investigated variables such as training methods (on-the-job and off-the-job), employee performance, and productivity outcomes. A descriptive research design was employed, targeting employees at a specific organization in Ghana, with a sample size of 103 participants. Data were collected through surveys, focusing on training types, delivery methods, and challenges. Descriptive statistics were used for data analysis. The findings revealed that training methods included team leadership, fire management, and safety protocols, delivered through demonstrations, discussions, and seminars. Training enhanced skills, leadership, productivity, and protocol adherence, but challenges included inadequate logistics, inconsistent training, and lack of incentives. The study recommended acquiring audio-visual aids to improve training effectiveness. A key strength was its practical focus on real-world training challenges

and their impact on performance. However, the study's reliance on a single organization limited its generalizability, and the lack of advanced statistical analysis restricted deeper insights into variable relationships.

Jaworski et al. (2018) examined the effects of training satisfaction, employee benefits, and incentives on part-time employees' commitment in the hospitality industry. The study explored training method, training duration, follow-up training, benefits, incentives, and training satisfaction as variables influencing job commitment. A survey methodology was employed, targeting part-time hotel employees in the U.S., with a sample size of 120 participants. Data were collected using a structured questionnaire measuring demographic variables, training satisfaction, and job commitment. Data analysis involved descriptive statistics and regression to test hypotheses. The findings revealed that on-the-job training and job shadowing significantly predicted training satisfaction, while select benefits, incentives, and training satisfaction positively influenced job commitment. The study recommended that lodging managers adopt on-the-job training and job shadowing to enhance training satisfaction and provide benefits to improve commitment. The strength of this study lay in its focus on the under-researched part-time employee segment, offering practical implications for hospitality management. However, the study's limitation was its small sample size and U.S.-centric focus, which may limit generalizability to other regions or industries.

Ahmed (2018) investigated the influence of in-service training on lecturers' job performance in colleges of education in North-west Zone, Nigeria. The study examined the impact of conferences, workshops, seminars, and intensive training on job performance. A survey design was employed, targeting 90 business education lecturers, with the entire population used as the sample. Data were collected via questionnaires and analyzed using mean, standard deviation, and regression analysis at a 0.05 significance level. Findings revealed that conferences, workshops, seminars, and intensive training significantly enhanced lecturers' job performance. The study recommended promoting in-service training to improve performance. Its strength lies in its comprehensive population coverage, ensuring robust findings. However, the study's limitation was its reliance on self-reported data, which may introduce bias, and its focus on a single region, limiting generalizability.

Olatoye et al. (2024) examined the influence of training and development on employee productivity in an organization, focusing on variables such as training methods, skill gaps, and career development. The study employed a descriptive survey design, targeting 311 employees from Berger Paints Nigeria PLC and Belux Paints Ventures Company. Data were collected using a structured questionnaire (ITDEPO, $r=0.60$) and analyzed with descriptive statistics, correlation analysis (PPMC), and simple linear regression. Findings revealed that training significantly enhanced productivity ($\beta=.657$, $p<.05$), with on-the-job training being predominant. The study recommended professional identification of training needs, structured training calendars, and effectiveness evaluations. Its strength lies in its robust sample size and reliable instrument.

However, the study's reliance on self-reported data may introduce bias, and its focus on two organizations limits generalizability.

Training Quality and Employee Performance

Adeyemo et al. (2024) examined training and development and employee retention rates in listed insurance companies in Nigeria, guided by the Human Capital Theory. The study investigated the effect of training frequency, training quality, and development opportunities on job satisfaction and turnover intention. A cross-sectional survey design was adopted, targeting management staff from 23 listed insurance firms. Data were collected through structured questionnaires, with validity and reliability ensured through rigorous testing. Multivariate Analysis of Variance (MANOVA) was employed to test the hypotheses. The findings revealed that training frequency and quality significantly enhanced job satisfaction but did not have a significant impact on turnover intention. Development opportunities moderately improved job satisfaction but also showed no significant relationship with turnover intention. The study recommended that organizations maintain continuous and high-quality training programs to enhance job satisfaction while exploring other factors such as organizational culture, employee engagement, and career aspirations to improve retention. The strength of the study was its use of MANOVA, which allowed simultaneous assessment of multiple dependent variables, enhancing the robustness of results. However, its limitation was the exclusive focus on management staff, which may not fully capture the perceptions of non-managerial employees whose retention challenges might differ.

Ugbaka et al. (2021) examined the effects of training on organizational performance, focusing on training quality as a key variable. The study investigated how training quality, alongside employee motivation and training design, influenced organizational performance in microfinance banks. A descriptive survey methodology was employed, targeting employees of microfinance banks in Nigeria, with a sample size of 150 respondents. Data were collected through structured questionnaires and analyzed using regression analysis. The findings revealed that high-quality training significantly enhanced employee skills, knowledge, and commitment, leading to improved organizational productivity and efficiency. The study recommended that organizations prioritize structured training programs and align them with employee needs to maximize performance outcomes. The strength of this study lay in its practical focus on microfinance banks, providing context-specific insights. However, the review was limited by its small sample size, which may restrict generalizability, and the lack of longitudinal data to assess long-term training impacts. Additionally, the study did not explore potential moderating variables such as organizational culture.

Shubhi et al. (2025) examined the impact of training and development programs on employee performance. The study evaluated training quality, job satisfaction, skill enhancement, productivity, and motivation among employees. It adopted a quantitative approach with a descriptive design, targeting employees from various sectors who had undergone formal training in the last year. A simple random sampling method selected 100

respondents from entry to executive levels. Data were collected through a structured questionnaire and analyzed using descriptive statistics and correlation analysis via SPSS. Findings revealed a strong positive relationship between training quality and employee performance, with well-structured programs significantly improving productivity, motivation, and retention. The study recommended implementing strategic, tailored training frameworks that align with organizational goals and employee needs. The strength of this research lay in its sectoral diversity and use of correlation analysis to quantify relationships. However, it was limited by reliance on self-reported data, potential sampling bias excluding untrained employees, and geographic restrictions, which may affect generalizability.

Mustafa-Sadiku (2025) investigated the effects of training on improving employee performance, focusing on how training quality influenced job satisfaction, productivity, and organizational success. The study examined training frequency and quality as independent variables and employee productivity as the dependent variable. A quantitative approach was employed, collecting data from 160 employees across various firms with established training programs in North Macedonia. A comprehensive questionnaire captured employees' perceptions of training efficacy. Regression analysis, conducted using SPSS, revealed a significant positive correlation ($R = 0.791$) between training quality and employee performance, with training explaining 62.5% of performance variation. The study recommended tailored, ongoing training programs to enhance job satisfaction and productivity, emphasizing continuous evaluation and technology integration. The strength of the study lay in its high internal consistency (Cronbach's Alpha = 0.941) and diverse sample. However, the study's reliance on self-reported data may introduce bias, and its focus on specific regions limits generalizability.

Training Evaluation & Feedback and Employee Performance

Masinde and Maket (2024) examined the effect of training evaluation methods on employee performance in public service, Kenya, focusing on diagnostic and formative training evaluation methods. The study adopted an explanatory research design, targeting 340 HR staff at the Ministry of Transport and Infrastructure, with a sample of 181 employees selected using the Krejcie and Morgan table and simple random sampling. Data were collected via questionnaires and analyzed using descriptive, correlation, and regression analyses. Findings revealed that diagnostic ($\beta=0.318$, $p=0.001$) and formative ($\beta=0.003$, $p=0.001$) evaluations significantly enhanced employee performance, though the model explained only 7.9% of performance variance. The study recommended strengthening diagnostic and formative evaluation practices to improve feedback and performance. Its strength lay in its robust statistical approach, providing empirical evidence for training evaluation's impact. However, the limited sample size and reliance on questionnaires may restrict generalizability and depth, as qualitative methods could have enriched contextual insights.

Odesanya (2020) assessed the impact of training and development on employees' productivity in First Bank of Nigeria Plc, Osogbo. The study had four objectives, which were to identify trajectories for employee

training needs, assess the viability of ongoing training and development programs, determine the outcomes of these strategies on job performance over time, and propose new measures to improve productivity. The independent variable was training and development, while the dependent variable was employees' productivity, with job satisfaction implied as a related measure. The study adopted a survey research methodology, targeting 132 employees across four branches in Osogbo, Nigeria. Data were collected using a structured questionnaire based on a Likert scale, supplemented by secondary data. Analysis was carried out using the Statistical Package for the Social Sciences (SPSS) version 2.0, with descriptive statistical techniques and tabular presentations. Findings revealed that current training and development programs had minimal impact on job performance due to resistance to change, lack of access to updated IT systems, and bureaucratic bottlenecks from centralized decision-making at the head office. The study recommended adopting state-of-the-art IT-based training, decentralizing operational decisions, and creating continuous development programs aligned with modern banking needs. A major strength of the study was its integration of multiple HRM theoretical frameworks to provide a multidimensional analysis of the problem. However, a limitation was its focus on a single bank branch cluster, which may limit the generalization of results across the Nigerian banking sector.

Theoretical Framework

Human Capital Theory

Human Capital Theory, primarily developed by economists Gary Becker and Theodore Schultz in the 1960s, posits that investments in education, training, and other skill-enhancing activities increase an individual's productivity, thereby contributing to organizational and economic outcomes (Becker, 1964; Schultz, 1961). Becker's seminal work emphasized that individuals and organizations invest in human capital comprising knowledge, skills, and abilities to improve performance and achieve competitive advantages (Becker, 1964). Schultz complemented this by highlighting how education and training enhance workforce capabilities, viewing employees as assets whose value appreciates through development (Schultz, 1961). The theory assumes that employees with enhanced skills through training produce higher-quality outputs, are more efficient, and contribute significantly to organizational goals, aligning with the study's focus on the effect of in-service training on employee performance in the Ministry of Works, Plateau State.

The theory explains that in-service training, as a form of human capital investment, equips employees with relevant skills and knowledge, directly improving task completion rates, work quality, and goal achievement (Becker, 1964). For instance, training resource availability, such as updated tools and materials, enhances employees' ability to perform tasks efficiently, as seen in Eljali et al.'s (2020) study, where adequate resources explained 57% of performance variance in Libyan companies. Similarly, frequent training, as Mustafa-Sadiku (2025) noted, fosters continuous skill updates, enabling employees to adapt to evolving job demands, such as new construction standards in the Ministry of Works. Training methods, like on-the-job

coaching or off-the-job workshops, facilitate practical skill application, as Twongyeirwe et al. (2024) found with mentoring's correlation to performance.

The strengths of Human Capital Theory lie in its empirical support and applicability across contexts. It provides a robust framework for understanding how training investments yield measurable outcomes, such as improved task efficiency and organizational goal achievement (Becker, 1993). Studies like Vokshi (2020) in Kosovo's banking sector, where training boosted motivation and performance, validate this. The theory's focus on quantifiable returns, such as increased productivity, aligns with the study's metrics of task completion and work quality. However, its weaknesses include an overemphasis on economic outcomes, potentially neglecting non-quantifiable factors like employee morale or organizational culture (Blaug, 1976). Critics argue it assumes rational decision-making, ignoring barriers like resource constraints or resistance to training, as Okumu et al. (2018) found in Kenya's judiciary, where limited budgets hindered training outcomes. Additionally, the theory may oversimplify the link between training and performance, as Atif et al. (2011) noted that poorly designed programs yielded insignificant results, suggesting contextual factors matter.

Critics like Blaug (1976) argued that Human Capital Theory reduces employees to economic units, overlooking social and psychological dimensions of performance, such as job satisfaction, which Kinicki and Kreitner (2007) linked to employee happiness. Furthermore, it may not fully account for external factors, such as organizational policies or economic conditions, which can mediate training's impact, as seen in Giday and Perumal's (2023) study on resource scarcity in Mekelle schools. Despite these critiques, the theory's relevance persists, as it explains how structured in-service training enhances employee capabilities, directly impacting performance metrics in public sector settings like the Ministry of Works (Yimam, 2022).

In this study, Human Capital Theory underpins the relationship between in-service training and employee performance by framing training as an investment that enhances skills, leading to improved timeliness, work quality, and goal achievement. Scholarly views support this: Ugwu (2019) found that training at the Federal Radio Corporation of Nigeria improved productivity, aligning with Becker's (1964) view that skill enhancement drives performance.

Furthermore, Human Capital Theory's focus on measurable outcomes aligns perfectly with the study's dependent variable. The theory emphasizes that investments in human capital lead to quantifiable benefits, such as increased productivity and efficiency. This resonates with the study's use of specific performance metrics: task completion rate (timeliness), quality of work output, and goal achievement. These metrics are not abstract concepts but tangible indicators of employee performance that can be directly influenced by training. As supported by Vuong and Nguyen (2022) and Rasul et al. (2021), these quantifiable measures allow for a clear evaluation of the training's effectiveness, which is a central theme of your research.

This theory's relevance to the public sector context makes it an appropriate foundational theory for this study. While often associated with private enterprises, Human Capital Theory is equally applicable to government organizations. Yimam's (2022) study, for example, demonstrates how training can improve an employee's ability to achieve organizational goals in a public setting. For the Ministry of Works, Plateau State, a well-trained workforce is essential for executing projects efficiently, maintaining infrastructure, and serving the public.

Methodology

This study employed a cross-sectional research design, gathering data at a single point in time to investigate the impact of in-service training on employees' performance within the Ministry of Works, Plateau State. This design facilitated the description of existing in-service training practices and allowed for the examination of hypothesized relationships between variables such as training methods, training quality, and training evaluation and feedback, alongside performance measures including timeliness, quality of work output, and goal achievement.

This study population comprised all 88 staff of the Ministry of Works, Plateau State (Open Registry, Ministry of Works, Plateau State, 2025). A census sampling technique, also known as complete enumeration, was employed, involving the inclusion of every member of the population in the study. By engaging all staff, the method allowed for the collection of accurate, representative, and detailed data on in-service training and employee performance, thereby enhancing the validity and reliability of the study's findings.

Data for this study was collected through primary sources using a structured questionnaire as the primary instrument. The questionnaire utilized close-ended questions formatted on a five-point Likert scale.

A stratified random sampling technique was used, with job roles (e.g., technical, administrative, managerial) as strata, and respondents randomly selected within each stratum to minimize bias and enhance generalizability. Trained research assistants facilitated questionnaire distribution and retrieval, ensuring confidentiality and addressing respondent queries. To ensure validity, items were adapted from peer-reviewed studies with established reliability. A pilot test with a small sample of employees from a non-participating ministry in Plateau State refined question clarity and relevance. Reliability was assessed using Cronbach's Alpha, achieving a threshold of 0.7 or higher, confirming internal consistency. Internal consistency was assessed using Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE) via Partial Least Squares Structural Equation Modeling (PLS-SEM).

The results of the reliability analysis, conducted using SmartPLS 3, are shown in Table 3.

Table 3: Pilot Test Results

Construct	Cronbach's Alpha	No. of Items
Training Methods (TMD)	0.865	5
Training Quality (TQL)	0.889	5
Training Evaluation and Feedback (TEF)	0.842	5
Employee Performance (EMP)	0.905	5

Source: SmartPLS 3 Output, 2025.

Technique for Data Analysis and Model Specifications

The data for this study were analyzed using both descriptive statistics and Partial Least Squares Structural Equation Modelling (PLS-SEM). Descriptive statistics, including mean, median, standard deviation, and range, were employed to summarize the demographic characteristics (e.g., age, gender, years of service) and key variable responses (Training Methods, Training Quality, Training Evaluation and Feedback, and Employee Performance).

The evaluation of the measurement model focused on establishing reliability and validity through factor loadings (≥ 0.708), AVE (≥ 0.50), and internal consistency metrics (Cronbach's Alpha and Composite Reliability ≥ 0.70). Discriminant validity was assessed using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio to ensure that constructs were distinct. For the structural model, key indicators such as R^2 (to assess the proportion of variance explained in Employee Performance), Q^2 (for predictive relevance), and collinearity diagnostics using Variance Inflation Factor (VIF) were examined before interpreting the relationships among constructs. This approach ensured robust analysis of how in-service training variables influence employee performance in the Ministry of Works, Plateau State, aligning with the study's objectives of assessing timeliness, quality of work output, and goal achievement.

Data Presentation and Analysis

Data Presentation

A total of 88 copies of the questionnaire were distributed to all staff members of the Ministry of Works, Plateau State, as part of the census sampling approach. Out of these, 82 copies, representing 93.18%, were completely filled and returned, while 6 copies, accounting for 6.82%, were returned but not properly completed. The 82 valid responses were used for subsequent data analysis as it reflects acceptable response rate and sufficient for robust statistical analysis and generalization within the Ministry.

Table 4 Questionnaire Response Rate

Description	Responses	Percentage (%)
Completely filled and returned	82	93.18%
Not properly filled but returned	6	6.82%
Total	88	100%

Source: Field Survey, 2025.

Descriptive Statistics**Table 5: Descriptive Statistics**

Construct	Items	Mean	Median	Min	Max	Std. Dev.	Excess Kurtosis	Skewness	No. of Obs. Used
Training Methods	TMD1-TMD3	4.57	5.00	1.0	5.0	0.74	7.70	-2.49	82.000
Training Quality	TQL1-QL3	4.56	5.00	1.0	5.0	0.78	7.57	-2.48	82.000
Training Eval& Fdb	TEF1-TEF3	4.54	5.00	1.0	5.0	0.71	7.25	-2.25	82.000
Employees' Perf	EMP1-EMP3	4.64	5.00	1.0	5.0	0.66	7.81	-2.44	82.000

Source: SMART PLS Output, 2025.

Table 4 presents a detailed statistical summary of the constructs examined in this study, outlining the mean, median, minimum, maximum, standard deviation, skewness, and kurtosis for each variable. The results generally indicate a high level of agreement across all constructs, as evidenced by mean scores consistently exceeding the midpoint of 3.00 on the 5-point Likert scale. The constructs of Training Methods, Training Quality, and Training Evaluation & Feedback showed similar patterns of high satisfaction. Training Methods recorded a mean of 4.57 (SD = 0.74), Training Quality had a mean of 4.56 (SD = 0.78), and Training Evaluation & Feedback showed a mean of 4.54 (SD = 0.71). These figures indicate that the vast majority of employees perceive the training methods as effective, the content as high-quality, and the feedback mechanisms as functional. Finally, the dependent variable, Employees' Performance, recorded the highest mean score of 4.64 with a low standard deviation of 0.66, indicating that employees consistently rated their task completion, work quality, and goal achievement very highly.

In terms of data distribution, the skewness and kurtosis values provide insight into the normality of the dataset. All constructs exhibited negative skewness, ranging from -1.58 to -2.49, which indicates a left-skewed distribution where the majority of responses are clustered at the higher end of the scale. Furthermore, the excess kurtosis values were positive and generally high, ranging from 1.65 to 7.81, revealing a leptokurtic distribution with heavy tails. While this signifies that the data is not perfectly normally distributed, this is common in self-reported performance studies and poses no issue for the analysis, as the Partial Least Squares

Structural Equation Modeling (PLS-SEM) technique employed in this study is non-parametric and robust against non-normal data distributions.

Table 4: Factor Loadings of the Constructs

Construct	Factor Loadings
Training Methods (TMD)	
TMD1	0.843
TMD2	0.743
TMD3	0.838
Training Quality (TQL)	
TQL1	0.902
TQL2	0.868
TQL3	0.865
Training Evaluation and Feedback (TEF)	
TEF1	0.850
TEF2	0.811
TEF3	0.769
Employee Performance (EMP)	
EMP1	0.856
EMP2	0.780
EMP3	0.841

Source: SmartPLS 3 Output, 2025.

Table 4 revealed that most factor loadings for the constructs in the study exceeded the recommended threshold of 0.708, indicating strong indicator reliability. All constructs; Training Methods, Training Quality, Training Evaluation and Feedback, and Employee Performance) demonstrated robust measurement properties

Construct Reliability

Table 5: Construct Reliability and Validity

Construct	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Training Methods (TMD)	0.877	0.885	0.910	0.669
Training Quality (TQL)	0.894	0.899	0.923	0.705
Training Evaluation and Feedback (TEF)	0.875	0.878	0.909	0.668
Employee Performance (EMP)	0.877	0.882	0.910	0.670

Source: SmartPLS 3 Output, 2025.

Table 5 presents the construct reliability and validity for the study on in-service training's effect on employee performance in the Ministry of Works, Plateau State. All constructs, Training Methods ($\alpha=0.877$, CR=0.910, AVE=0.669), Training Quality ($\alpha=0.894$, CR=0.923, AVE=0.705), Training Evaluation and Feedback

($\alpha=0.875$, $CR=0.909$, $AVE=0.668$), and Employee Performance ($\alpha=0.877$, $CR=0.910$, $AVE=0.670$) exceeded thresholds ($\alpha \geq 0.7$, $CR \geq 0.7$, $AVE \geq 0.5$), confirming strong reliability and convergent validity.

Collinearity Test

Table 6: Inner VIF Values of the Structural Model

Variables	Employee Performance (EMP)
Training Evaluation and Feedback (TEF)	3.340
Training Methods (TMD)	3.882
Training Quality (TQL)	4.267

Source: SMART-PLS Output, 2025.

Table 6 presents the Inner Variance Inflation Factor (VIF) values used to assess multicollinearity among the independent variables in predicting Employee Performance. The results show that Training Quality (TQL) recorded the highest VIF value of 4.267, followed by Training Methods (TMD) at 3.882, and Training Evaluation and Feedback (TEF) at 3.340. Since all the VIF values are significantly below the recommended threshold of 5.0, it is confirmed that there are no multicollinearity issues between the constructs, ensuring the reliability of the regression estimates in the structural model.

Coefficient of Determination (R^2)

The coefficient of determination (R^2) indicates the proportion of variance in employees' performance that is explained by the in-service training variables in the model. According to Chin (1998), R^2 values of 0.67, 0.33, and 0.19 represent substantial, moderate, and weak explanatory power, respectively.

Endogenous Variable	R Square	R Square Adjusted
Employee Performance (EMP)	0.764	0.761

Source: SmartPLS Output, 2025.

The R^2 value of 0.764 shows that approximately 76.4% of the variance in employee performance is explained by the combined effects of Training Methods, Training Quality, and Training Evaluation and Feedback. The Adjusted R^2 of 0.761 confirms the robustness of this explanatory power by accounting for the number of predictors in the model. This indicates a substantial level of predictive accuracy, suggesting that the selected in-service training variables are strong predictors of employee performance in the Ministry of Works, Plateau State.

Assessment of Structural Model

Following the validation of the measurement model, the next phase in evaluating the PLS-SEM analysis involved assessing the structural model. To ensure the robustness of the findings, the bootstrapping technique

was employed using 5,000 resamples, as recommended by Hair et al. (2019). This approach provided standard errors and confidence intervals necessary for hypothesis testing.

4.2.3 Test of Hypotheses

Table 4.10: Path Coefficient of the Model

Variables	Beta	T Statistics	P Values	Decision
Training Methods (TMD) → EMP	0.164	2.550	0.011	Rejected
Training Quality (TQL) → EMP	0.223	2.752	0.006	Rejected
Training Evaluation & Feedback (TEF) → EMP	0.257	3.814	0.000	Rejected

Source: SmartPLS Output, 2025.

Hypothesis One

H₀₁: Training methods have no significant impact on employees' performance at the Ministry of Works, Plateau State

The result from Table 4.9 revealed that Training Methods have a positive and significant effect on employee performance, with $\beta = 0.164$ and $p = 0.011$. This result does not support the null hypothesis and was therefore rejected at a 5% level of significance. The study concludes that the use of varied training methods, such as on-the-job and off-the-job training, significantly improves employees' performance in the Ministry of Works, Plateau State.

Hypothesis Two

H₀₂: Training quality has no significant effect on employees' performance at the Ministry of Works, Plateau State.

The result from Table 4.9 showed that Training Quality has a positive and significant effect on employee performance, with $\beta = 0.223$ and $p = 0.006$. This result does not support the null hypothesis and was therefore rejected at a 5% level of significance. The study concludes that high-quality training, characterized by relevant content and skilled trainers, significantly enhances employees' task completion, work quality, and goal achievement.

Hypothesis Three

H₀₃: Training evaluation and feedback have no significant effect on employees' performance at the Ministry of Works, Plateau State.

The result from Table 4.9 indicated that Training Evaluation and Feedback have a positive and significant effect on employee performance, with $\beta = 0.257$ and $p = 0.000$. This result does not support the null hypothesis and was therefore rejected at a 5% level of significance. The study concludes that effective training evaluation and feedback mechanisms significantly improve employees' performance in the Ministry of Works, Plateau State.

Discussion of Findings

Training Methods exhibited a positive and significant effect on Employee Performance ($\beta = 0.164$, $p = 0.011$), resulting in the rejection of the null hypothesis (H_{03}) at a 5% significance level. This indicated that diverse training methods, such as on-the-job and off-the-job training, enhance employees' skills, productivity, and goal achievement. This finding is consistent with Siddiqui (2018), who reported a significant relationship between training methods and performance in India, with on-the-job training showing a stronger impact. Similarly, Twongyeirwe et al. (2024) found a strong correlation between on-the-job training and performance in Uganda. However, Adaobi and Owusuaa-Konadu (2022) noted challenges like inadequate logistics, which may limit method effectiveness in resource-constrained settings like Plateau State, suggesting the need for tailored approaches.

Training Quality and Employee Performance

Training Quality showed a positive and significant effect on Employee Performance ($\beta = 0.223$, $p = 0.006$), leading to the rejection of the null hypothesis (H_{04}) at a 5% significance level. This suggested that high-quality training, characterized by relevant content and skilled trainers, significantly improves employees' task completion, work quality, and goal achievement. This result aligns with Ugbaka et al. (2021), who found that high-quality training enhanced skills and productivity in Nigerian microfinance banks. Similarly, Shubhi et al. (2025) reported a strong relationship between training quality and performance across sectors. In contrast, Khawaldeh (2023) found that training quality had a moderate effect in Jordan, suggesting that trainer expertise may outweigh content quality in some contexts, a nuance applicable to Plateau State's training programs.

Training Evaluation and Feedback and Employee Performance

Training Evaluation and Feedback exhibited a positive and significant effect on Employee Performance ($\beta = 0.257$, $p = 0.000$), resulting in the rejection of the null hypothesis (H_{05}) at a 5% significance level. This indicated that effective evaluation and feedback mechanisms enhance employees' performance by addressing skill gaps and aligning training with organizational goals. This finding is consistent with Masinde and Maket (2024), who reported that diagnostic and formative evaluations significantly improved performance in Kenya's public service. Similarly, Kishore and Fonceca (2023) found a significant correlation between training evaluation and performance. However, Giday and Perumal (2023) noted inadequate evaluation practices in Ethiopia, suggesting that untimely assessments may limit impact, a potential concern for Plateau State if feedback mechanisms are not robust.

Conclusion

The first hypothesis revealed that Training Methods have a positive and significant effect on employee performance ($\beta = 0.164$, $p = 0.011$). This concludes that diverse training methods, such as on-the-job and off-the-job training, enhance employees' skills and productivity.

According to the second hypothesis, Training Quality has a positive and significant effect on employee performance ($\beta = 0.223$, $p = 0.006$). This finding concludes that high-quality training, with relevant content and skilled trainers, significantly improves task completion, work quality, and goal achievement.

Lastly, the quantitative results and empirical analysis showed that Training Evaluation and Feedback have a positive and significant effect on employee performance ($\beta = 0.257$, $p = 0.000$). This concludes that effective evaluation and feedback mechanisms enhance performance by addressing skill gaps and aligning training with organizational goals.

Recommendations

Based on the findings and conclusions, the study recommends the following:

- i. The Ministry should adopt diverse training methods, including on-the-job techniques like job rotation and mentoring, and off-the-job methods like workshops and seminars, to enhance employee skills and adaptability, thereby improving productivity and goal achievement.
- ii. Training quality should be enhanced by ensuring content is relevant, trainers are skilled, and delivery methods are engaging. The Ministry should partner with professional training providers to design programs that address specific skill gaps, boosting employee confidence and performance.
- iii. Robust training evaluation and feedback mechanisms should be implemented, using diagnostic and formative evaluations to assess training effectiveness and provide actionable feedback. This will ensure training aligns with organizational goals and directly contributes to improved employee performance.

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