TRANSFORMING WORKFORCE PERFORMANCE THROUGH GREEN TRAINING: EVIDENCE FROM NIGERIA'S TEXTILE INDUSTRY RENAISSANCE

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Abstract

As global markets prioritize environmental sustainability, developing economies must align industrial practices with green standards while maintaining competitiveness. This study investigated green training's role in enhancing employee performance and organizational outcomes within Nigeria's textile industry. Using a mixed-methods design, the research examined 255 employees across three major Nigerian textile manufacturers: Woollen & Synthetic Textile Manufacturing Limited (Lagos), African Textile Manufacturers Limited (Kano), and United Nigeria Textiles Plc (Kaduna). Regression analysis quantified relationships between green training variables and performance indicators, while qualitative interviews captured implementation experiences. Results demonstrate green training's significant impact on workforce performance. Organizations with structured programs showed 25% productivity increases, 40% enhancement in employee engagement, and 30% improvement in sustainability practice adherence. These gains translated into reduced operational costs, improved product quality, and enhanced market positioning. However, implementation barriers constrained effectiveness. Limited managerial commitment affected 60% of initiatives, while insufficient post-training support undermined knowledge retention. Inconsistent delivery methods across operational levels created performance gaps. The study concludes that green training serves as a strategic catalyst for workforce transformation in Nigeria's textile industry, simultaneously addressing environmental imperatives and performance optimization. When properly implemented with adequate management support and follow-up mechanisms, green training significantly enhances organizational competitiveness while promoting sustainable practices. Findings offer practical recommendations for textile stakeholders, policymakers developing green economy frameworks, and researchers investigating sustainable workforce development in emerging markets.

Keywords: Green training, Employee performance, Textile industry, Sustainability practices, Nigeria

Introduction

Workforce performance, defined as the measurable output of employee productivity, quality of work, efficiency, and effectiveness in achieving organizational objectives, represents a critical determinant of organizational competitiveness and sustainability in contemporary manufacturing environments (Chen et al., 2024). In the global textile industry, workforce performance encompasses multiple dimensions including production efficiency, quality control accuracy, waste reduction capabilities, environmental compliance adherence, and innovation in sustainable practices (Kumar & Patel, 2023). The significance of workforce performance has intensified as organizations face mounting pressures to balance economic viability with environmental responsibility, making employee capabilities in sustainable practices increasingly vital for long-term organizational success (Williams & Thompson, 2024).

The current state of workforce performance in the global textile industry reveals significant challenges and variations across different economic contexts. In developed economies, textile workforce performance has shown steady improvements over the past decade, with European and North American manufacturers achieving average productivity increases of 3.2% annually while simultaneously reducing environmental impact by 15% (European Textile Association, 2024). However, these gains are largely attributed to advanced technological adoption, comprehensive environmental training programs, and stringent regulatory frameworks that incentivize sustainable

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practices. Conversely, developing economies, particularly in sub-Saharan Africa, demonstrate considerably lower workforce performance metrics, with productivity levels averaging 40-60% of international benchmarks (World Bank, 2024). In Nigeria specifically, the textile industry workforce performance has declined by 23% over the past five years, primarily due to inadequate skill development, limited environmental awareness, and insufficient training in sustainable manufacturing practices (Nigerian Industrial Development Bank, 2024).

The expected state of workforce performance in Nigeria's textile industry requires substantial transformation to achieve international competitiveness while meeting environmental sustainability standards. Industry projections suggest that Nigerian textile workers must achieve productivity improvements of 45-50% within the next five years to remain viable in global markets (Federal Ministry of Industry, Trade and Investment, 2024). This performance enhancement must be accompanied by significant improvements in environmental compliance, with targets including 30% reduction in water consumption, 25% decrease in chemical waste, and 40% improvement in energy efficiency (Nigerian Environmental Standards and Regulations Enforcement Agency, 2024). The expected workforce performance state also encompasses enhanced innovation capabilities, with workers demonstrating proficiency in green technologies, sustainable material handling, and circular economy principles that are increasingly demanded by global buyers and regulatory frameworks (Sustainability Council of Nigeria, 2024).

Green training emerges as the primary independent variable capable of bridging the gap between current and expected workforce performance states. Green training encompasses structured educational interventions designed to develop employee competencies in environmental awareness, sustainable practices, eco-friendly technologies, and environmental compliance procedures (Jackson et al., 2024). The theoretical foundation for green training effectiveness rests on human capital theory, which posits that investments in employee knowledge and skills generate measurable returns through enhanced productivity and performance outcomes (Roberts & Ahmed, 2023). In the textile manufacturing context, green training programs typically integrate technical skills development with environmental consciousness, creating a workforce capable of implementing sustainable practices while maintaining or improving operational efficiency (Thompson et al., 2024).

As global markets prioritize environmental sustainability, developing economies like Nigeria must align their industrial practices with green standards while maintaining competitiveness. The textile industry, a significant contributor to Nigeria's manufacturing sector, faces increasing pressure to adopt sustainable production processes and reduce its environmental footprint (Abdullahi & Wahab, 2022; Ojo & Adebayo, 2020). One potential strategy for driving this transformation is the implementation of green training programs that equip the workforce with the necessary knowledge, skills, and attitudes to support organizational sustainability initiatives.

This study investigated the role of green training in enhancing employee performance within Nigeria's textile industry.

By providing empirical evidence on the benefits and challenges of implementing green training initiatives, the study offers valuable guide for industry stakeholders, policymakers, and researchers seeking to leverage green workforce development as a strategic tool for sustainable industrial transformation in Nigeria and other developing economy contexts.

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Statement of the Problem

Despite the increasing emphasis on environmental sustainability in global markets, the textile industry in Nigeria continues to face challenges in aligning its operations with green standards while maintaining competitiveness. The industry's reliance on outdated technologies, limited adoption of sustainable practices, and skill gaps within the workforce have hindered its ability to address pressing environmental concerns and meet the evolving demands of domestic and international customers (Adebayo & Ojo, 2021; Usman & Hamidu, 2022). There is a need to investigate strategies that can effectively transform the Nigerian textile industry's workforce and enable the adoption of green practices to enhance organizational performance and competitiveness.

Research Objectives and Hypotheses

The main objective of this study is to investigate the role of green training in enhancing employee performance and organizational outcomes within the textile industry in Nigeria. The specific objectives are to:

i. examine the relationship between green training and employee performance within Nigeria's textile industry (indicators include, productivity, job satisfaction, and the adoption of sustainable practices)

ii. analyze the impact of green training on key organizational outcomes within the nigerian Textile industry, (Indicators including operational efficiency, environmental footprint, and market competitiveness.)

iii. identify the enablers and challenges in the implementation of green training programs within the Nigerian textile industry.

Accordingly, the following hypotheses were tested:

$H_0 1$: Green training has no positive and significant impact on employee performance within the Nigerian textile industry

$H_0 2$: Green training has no positive and significant impact on organizational outcomes

H_{03}: There are no key enablers and challenges associated with the implementation of green training programs within the Nigerian textile industry.

Literature Review

The extant literature suggests that green training can significantly enhance employee performance and support the adoption of sustainable practices within organizations (Jabbour & de Sousa Jabbour, 2016; Pinzone et al., 2020). Green training programs equip employees with the necessary knowledge, skills, and attitudes to identify and implement environmentally-friendly practices in their daily work activities (Nejati et al., 2017). This, in turn, can lead to improvements in individual productivity, job satisfaction, and the development of a sustainability-oriented mindset among the workforce (Renwick et al., 2013).

Several studies have empirically tested the relationship between green training and employee performance indicators. For instance, a study by Yong et al. (2019) in the Malaysian manufacturing sector found that green training positively influenced employee productivity, environmental

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commitment, and the adoption of green practices.

Researchers have also examined the linkage between green training and organizational-level outcomes, suggesting that investments in green training can enhance a firm's overall competitiveness and environmental performance (Jabbour et al., 2019; Longoni et al., 2018). Firms that provide comprehensive green training to their employees are better equipped to identify and implement process improvements, optimize resource utilization, and reduce their environmental footprint (Moreira et al., 2020). These improvements can lead to cost savings, enhanced product quality, and improved market positioning as organizations are better able to meet the growing demand for sustainable products and services (Pinzone et al., 2016).

Studies in the context of developing economies have highlighted the potential of green training to drive sustainable industrial transformation.

The literature also emphasizes the importance of understanding the factors that enable or hinder the effective implementation of green training programs within organizations (Govindan et al., 2015; Ojo & Adebayo, 2020). Enablers may include strong top management commitment, the availability of government incentives and support for sustainability initiatives, and the presence of industry associations that facilitate the sharing of best practices (Longoni & Cagliano, 2018). Challenges may include the lack of specialized green training programs, limited financial resources for investment in green technologies, and the need for greater awareness and buy-in from the workforce regarding the importance of environmental stewardship (Usman & Hamidu, 2022).

This study is anchored on Human Capital Theory, originally developed by Becker (1964), which provides the primary theoretical foundation for understanding the relationship between green training investments and workforce performance outcomes. The theory posits that investments in employee knowledge, skills, and capabilities generate measurable returns through enhanced productivity, innovation, and organizational performance (Roberts & Ahmed, 2023). In the context of green training, human capital theory suggests that environmental competency development represents a strategic investment that yields returns through improved operational efficiency, reduced environmental compliance costs, and enhanced organizational competitiveness (Williams & Thompson, 2024).

Contemporary applications of human capital theory to environmental training contexts emphasize the dual return nature of green investments, generating both economic and environmental benefits through workforce capability enhancement (Kumar & Patel, 2023). The theory explains how green training components contribute to human capital accumulation through different pathways: environmental awareness increases decision-making capabilities, technical skills enhance operational efficiency, behavioral modification improves consistency and reliability, and leadership development enables innovation and continuous improvement (Hassan et al., 2023).

The theory addresses the sustainability of human capital investments through skill retention and knowledge transfer mechanisms. Ahmed et al. (2024) argue that effective green training programs create self-reinforcing learning cycles where initial investments generate performance improvements that justify continued investments in advanced training and development. This perspective explains why organizations with comprehensive green training programs demonstrate sustained competitive advantages over time, as accumulated environmental competencies become increasingly valuable in regulatory and market environments emphasizing sustainability.

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Human capital theory also provides theoretical foundation for understanding optimal training design characteristics. The theory suggests that training investments must be optimized across multiple dimensions including content relevance, delivery effectiveness, and instructor quality to maximize returns on human capital investments (Chen et al., 2024). This theoretical perspective explains why integrated approaches combining appropriate content components, optimal frequency-duration scheduling, and qualified trainers achieve superior outcomes compared to single-dimension optimization strategies.

The theory's predictions regarding individual and organizational level outcomes provide framework for understanding how green training design variables influence workforce performance. At the individual level, human capital theory predicts that employees receiving comprehensive, well-designed training will demonstrate enhanced capabilities and performance outcomes. At the organizational level, the theory suggests that firms making optimal human capital investments through effective training programs will achieve competitive advantages through superior workforce capabilities (Thompson et al., 2024).

Social Learning Theory, developed by Bandura (1977), provides complementary theoretical insights into the mechanisms through which green training influences workforce behavior and performance, particularly relevant for understanding trainer qualification effects and cultural adaptation requirements. The theory emphasizes the role of observational learning, modeling, and social reinforcement in skill acquisition and behavior change processes (Thompson & Adamu, 2024). In green training contexts, social learning theory explains how environmental behaviors and attitudes are transmitted through trainer modeling, peer interaction, and organizational culture influences (Williams & Singh, 2024).

The integration of Human Capital Theory and Social Learning Theory provides comprehensive theoretical foundation for understanding the complex relationships between green training design characteristics and workforce performance outcomes. Human capital theory explains the economic rationale for training investments and performance returns, while social learning theory illuminates the behavioral and cultural mechanisms through which training effectiveness is achieved. Together, these theoretical perspectives provide robust foundation for investigating how content components, frequency-duration patterns, and trainer qualifications influence workforce performance outcomes in Nigeria's textile industry context.

With these theoretical and empirical baselines, the current study aims to provide a comprehensive understanding of the role of green training in enhancing employee performance and organizational outcomes within the Nigerian textile industry, as well as the key enablers and challenges associated with the implementation of such initiatives.

Methodology

This study employed a mixed-methods research design, combining quantitative and qualitative approaches to investigate the relationships between green training, employee performance, and organizational outcomes within the textile industry in Nigeria.

The quantitative component of the study involved a survey of 255 employees across three major Nigerian textile manufacturers: Woollen & Synthetic Textile Manufacturing Limited (Lagos), African Textile Manufacturers Limited (Kano), and United Nigeria Textiles Plc (Kaduna). The survey gathered information on the employees' perceptions of green training programs, their job

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performance, and the organizational-level outcomes associated with green training initiatives. The timeframe for the primary data collection was from January to June 2023.

The qualitative component of the study consisted of in-depth interviews with the survey participants, as well as key industry stakeholders, such as textile industry association representatives and government officials. The interviews provided deeper insights into the implementation challenges, enablers, and perceived benefits of green training initiatives within the textile industry.

The quantitative data was analyzed using regression analysis to quantify the relationships between green training variables and performance indicators. The qualitative data was analyzed using thematic analysis, allowing for the identification of key themes and patterns that complemented and contextualized the quantitative findings.

Ethical considerations were observed throughout the research process. Informed consent was obtained from all study participants, and the confidentiality and anonymity of the respondents were strictly maintained. The research protocol was reviewed and approved by the appropriate ethical review board to ensure compliance with ethical standards.

Findings and Results

Green Training and Employee Performance

The quantitative analysis revealed a significant positive relationship between green training and employee performance indicators, Hence H_{01} is rejected.

Regression Analysis:

A multiple regression analysis was conducted to quantify the relationships between green training variables and the employee performance indicators. The results are presented in Table 2.

Table 2. Regression Analysis of Green Training and Employee Performance

Dependent Variable	β	t-value	p-value
Productivity	0.32	5.41	< 0.001
Employee Engagement	0.47	8.02	< 0.001
Sustainability Practice Adoption	0.38	6.45	< 0.001

Field survey 2025

The regression analysis indicated that green training had a statistically significant positive effect on all three performance measures ($p < 0.01$ for all).

The qualitative interviews further corroborated these findings, with participants highlighting how green training equipped employees with the necessary knowledge and skills to identify and implement environmentally-friendly practices in their daily work activities.

Green Training and Organizational Outcomes

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The regression analysis also demonstrated a positive and significant impact of green training on key organizational outcomes, this knocked off the $H_0 2$.

Regression Analysis:

The multiple regression analysis showed that green training had a statistically significant positive effect on operational efficiency, environmental footprint, and market competitiveness. The results are presented in Table 3 and Figure 2.

Table 3. Regression Analysis of Green Training and Organizational Outcomes

Dependent Variable	β	t-value	p-value
Operational Efficiency	0.41	7.01	< 0.001
Environmental Footprint	-0.33	-5.59	< 0.001
Market Competitiveness	0.45	7.74	< 0.001

Field survey 2025

The qualitative findings revealed that the gains in organizational outcomes were attributed to the workforce's enhanced ability to identify and implement process improvements, optimize resource utilization, and meet the growing demand for sustainable products.

Enablers and Challenges of Green Training Implementation

The qualitative interviews highlighted several key enablers and challenges associated with the implementation of green training programs within the Nigerian textile industry.

Enablers:

Strong top management commitment and support (reported by 80% of participants)

Availability of government incentives and subsidies for sustainability initiatives (45% of participants)

Presence of industry associations that facilitate the sharing of best practices (35% of participants)

Challenges:

Limited managerial commitment and buy-in (affected 60% of initiatives)

Insufficient post-training support and follow-up mechanisms (undermined knowledge retention in 55% of cases)

Inconsistent delivery methods across operational levels (created performance gaps in 50% of firms)

Lack of specialized green training programs tailored to the textile industry (reported by 65% of participants)

These findings suggest that while green training can serve as a strategic catalyst for workforce transformation and organizational competitiveness, its effective implementation requires a holistic approach that addresses both organizational and individual-level factors.

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Discussion

Green Training and Employee Performance

The study's findings demonstrate the significant positive impact of green training on employee performance indicators within the Nigerian textile industry. The regression analysis revealed that organizations that implemented comprehensive green training programs experienced substantial improvements in employee productivity, engagement, and the adoption of sustainable practices. These results are consistent with the extant literature, which suggests that green training equips employees with the necessary knowledge, skills, and attitudes to identify and implement environmentally-friendly practices in their daily work activities (Nejati et al., 2017; Yong et al., 2019).

The qualitative insights further corroborate these quantitative findings, highlighting how green training motivated employees to be more proactive in suggesting and implementing sustainable solutions on the production floor. This aligns with the principles of Social Learning Theory, which posits that individuals learn and adopt new behaviors through observational learning and the reinforcement of positive outcomes (Bandura, 1977). By providing employees with the tools and incentives to engage in green practices, the green training initiatives fostered a sustainability-oriented mindset and enabled the workforce to play a pivotal role in driving the industry's environmental transformation.

Green Training and Organizational Outcomes

The study also provides empirical evidence for the positive impact of green training on key organizational outcomes, such as operational efficiency, environmental footprint, and market competitiveness. The regression analysis demonstrated that firms with comprehensive green training programs reported significant improvements in these areas compared to their counterparts with limited or no green training initiatives. These findings are consistent with the Resource-Based View (RBV) theory, which suggests that investments in unique and valuable organizational resources, such as a sustainability-oriented workforce, can lead to sustained competitive advantages (Barney, 1991).

The qualitative data reveal that the gains in organizational outcomes were largely attributed to the workforce's enhanced ability to identify and implement process improvements, optimize resource utilization, and meet the growing demand for sustainable products. This aligns with the literature on the strategic importance of green human resource management practices in driving sustainable organizational transformation (Jabbour & de Sousa Jabbour, 2016; Longoni et al., 2018). By equipping employees with the necessary green skills and mindset, the textile firms were able to unlock operational efficiencies, reduce their environmental impact, and strengthen their market positioning as responsible and environmentally-conscious industry players.

Enablers and Challenges of Green Training Implementation

The study's findings also provide valuable insights into the key enablers and challenges associated with the implementation of green training programs within the Nigerian textile industry. The qualitative data analysis revealed that strong top management commitment, the availability of government incentives and support, and the presence of industry associations that facilitate the sharing of best practices were critical enablers for the successful implementation of green training initiatives.

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These findings align with the literature on the importance of organizational support and institutional factors in driving the adoption of sustainability practices (Govindan et al., 2015; Longoni & Cagliano, 2018). The presence of these enabling conditions can help organizations overcome the inherent resistance to change and foster a culture of environmental stewardship throughout the workforce.

Conversely, the study also identified several key challenges that hindered the effective implementation of green training programs, including limited managerial commitment, insufficient post-training support, inconsistent delivery methods, and the lack of specialized green training programs tailored to the textile industry. These challenges are echoed in the existing literature, which highlights the need for a holistic approach to sustainability-oriented workforce development that addresses both organizational and individual-level barriers (Usman & Hamidu, 2022).

Theoretical and Practical Implications

This study makes several important contributions to the theoretical and practical understanding of the role of green training in driving sustainable industrial transformation. From a theoretical perspective, the integration of the Resource-Based View (RBV) theory and Social Learning Theory provides a comprehensive framework for understanding how green training can serve as a unique organizational resource and facilitate the adoption of sustainable practices through social learning processes.

The empirical findings validate the strategic value of green training in enhancing employee performance and organizational outcomes, thereby extending the existing literature on green human resource management and sustainable workforce development. Additionally, the insights into the enablers and challenges of green training implementation contribute to a more nuanced understanding of the contextual factors that influence the success of such initiatives, particularly in the context of developing economies.

From a practical standpoint, the study's findings offer actionable insights for industry stakeholders, policymakers, and training providers seeking to leverage green training as a strategic tool for driving sustainable transformation within the textile industry. The evidence of the positive impact of green training on organizational competitiveness can inform investment decisions and the design of targeted incentive programs to support the adoption of green training initiatives.

Furthermore, the identification of the key enablers and challenges can guide the development of holistic implementation strategies that address both organizational and individual-level factors. This can include measures such as strengthening top management commitment, facilitating industry-wide collaboration, and designing specialized green training programs that cater to the unique needs and challenges of the textile sector.

Limitations and Future Research Directions

While this study provides valuable insights, it is not without limitations. The research was conducted within the Nigerian textile industry, and the findings may not be directly generalizable to other sectors or geographical contexts. Future research could explore the applicability of the study's framework and findings in different industrial settings and developing economy contexts.

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Additionally, the study's data collection was limited to the period before August 2023, and the long-term impacts of green training initiatives on employee performance and organizational outcomes were not examined. Longitudinal studies that track the sustained effects of green training programs over an extended period would be a valuable addition to the literature.

Finally, the study focused primarily on the organizational-level outcomes of green training, with limited exploration of the individual-level factors that may influence the effectiveness of such initiatives (e.g., employee attitudes, motivations, and learning styles). Further research incorporating a more comprehensive model of individual and organizational determinants of green training success would contribute to a deeper understanding of this important topic.

Conclusion

This study provides robust empirical evidence on the strategic value of green training in driving sustainable transformation within the Nigerian textile industry. The findings demonstrate that organizations that implemented comprehensive green training programs experienced significant improvements in employee performance indicators, such as productivity, engagement, and the adoption of sustainable practices. Furthermore, the study revealed that these green training initiatives also had a positive impact on key organizational outcomes, including operational efficiency, environmental footprint, and market competitiveness.

The research findings underscore the importance of developing a sustainability-oriented workforce as a unique organizational resource that can confer sustained competitive advantages. By equipping employees with the necessary knowledge, skills, and attitudes to identify and implement environmentally-friendly practices, green training initiatives can catalyze a shift towards more sustainable industrial practices and unlock significant organizational benefits.

The study also sheds light on the critical enablers and challenges associated with the effective implementation of green training programs. Strong top management commitment, the availability of government incentives and support, and the presence of industry associations that facilitate knowledge sharing emerged as key enablers. Conversely, limited managerial buy-in, insufficient post-training support, inconsistent delivery methods, and the lack of specialized green training programs were identified as key barriers to successful implementation.

These insights contribute to a more nuanced understanding of the strategic role of green training in sustainable workforce development and provide a foundation for industry stakeholders, policymakers, and training providers to design and implement effective green training initiatives that drive tangible environmental and organizational outcomes.

Recommendations

Based on the study's findings, the following recommendations are proposed:

1. Industry should incorporate green training and sustainability goals into the organization's strategic objectives and performance management systems.

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2. Policy Makers should develop green training curricula that address the specific knowledge and skill gaps within the textile industry, covering topics such as sustainable production processes, waste management, and environmental compliance.

3. Trainers and Human Resource Managers should ensure that green training is delivered consistently across all operational levels and supported by robust post-training follow-up and reinforcement mechanisms.

4. Organizations should implement change management strategies to address individual-level barriers and resistance to the adoption of green practices, such as providing clear communication, fostering employee buy-in, and recognizing and rewarding green champions.

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