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ENHANCING ACADEMIC STAFF PERFORMANCE THROUGH ARTIFICIAL INTELLIGENCE-BASED TRAINING: A STUDY OF AHMADU BELLO UNIVERSITY AND ITS IMPLICATIONS FOR NATIONAL DEVELOPMENT

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Abstract

The persistent gap between investment in academic staff development and measurable performance outcomes in Nigerian universities, particularly in teaching effectiveness and research productivity, remains a major concern despite growing global emphasis on technologydriven education. This study therefore examines how Artificial Intelligence (AI)-based training enhances academic staff performance in Ahmadu Bello University, Zaria, and its implications for national development. The study adopted a descriptive survey research design. The population comprised academic staff in the Faculty of Administration, from which a sample size of 77 respondents was determined using Yamane's (1967) formula and selected through simple random sampling technique. Primary data were collected using structured questionnaires and interviews. Data were analyzed using both descriptive statistics (frequencies and percentages) and inferential statistics (multiple regression analysis) with the aid of SPSS. The findings revealed that AI-based training significantly improves academic staff performance by enhancing teaching effectiveness, digital competence, and assessment practices. Additionally, AI-driven research tools were found to significantly increase research productivity through improved data analysis, academic writing, and access to scholarly resources. The regression results indicated that both AI-based training and AI research tools have statistically significant effects on academic staff performance. The study concludes that AI-based training is a critical driver of academic excellence and a strategic tool for strengthening higher education systems in the digital age. It is recommended that universities integrate AI-driven training into staff development programs, while government agencies should expand funding to support digital infrastructure and AI capacity building. However, the study identified a gap in existing literature, particularly the limited empirical focus on AI-based training within specific institutional contexts in Nigeria, as most previous studies emphasize conventional training methods. The study therefore contributes to knowledge by providing empirical evidence on the role of AI in enhancing academic staff performance and its broader implications for national development.

1.1 Introduction

Across the globe, the performance of academic staff remains a critical determinant of educational quality, institutional competitiveness, and broader national development outcomes. Universities serve as hubs of knowledge production, innovation, and human capital development, and the effectiveness of these roles depends significantly on the competence, adaptability, and productivity of academic staff. Traditionally, academic staff performance has been conceptualized as a multidimensional construct comprising teaching effectiveness and research productivity (Salami, 2020; Ekundayo & Ajayi, 2019). Teaching effectiveness involves instructional delivery, curriculum design, student engagement, and learning outcomes, while research productivity is measured through publications, citations, conference participation, grants, and scholarly impact.

In the contemporary knowledge economy, however, the emergence of Artificial Intelligence (AI) is transforming higher education systems, redefining how academic staff are trained, how knowledge is delivered, and how research is conducted. AI-driven technologies such as machine learning, adaptive learning platforms, automated assessment systems, research analytics tools, and digital collaboration platforms are increasingly integrated into academic environments. These innovations are reshaping traditional training and development (T&D;) frameworks by enabling personalized learning, real-time feedback, predictive analytics, and data-driven decision-making in academic practice. Consequently, the focus of staff development is shifting from conventional methods to AI-enhanced capacity-building models that foster digital competence, research efficiency, and pedagogical innovation. Globally, universities operate within competitive ranking frameworks such as Times Higher Education (THE), QS Rankings, and Shanghai Rankings, where indicators such as research output, citation impact, and teaching quality are heavily emphasized. For instance, research influence and citations account for a significant proportion of ranking metrics in Times Higher Education frameworks. In response, leading universities in countries such as the United States, United Kingdom, Germany, China, and Japan have integrated AI-driven systems into academic staff development. These include intelligent tutoring systems, AI-assisted research tools, digital pedagogy platforms, and automated performance evaluation systems. Empirical evidence indicates that institutions leveraging AI in staff training report improved research productivity, enhanced teaching effectiveness, and increased global visibility through higher citation indices and international collaboration rates.

In contrast, higher education systems in sub-Saharan Africa continue to face structural challenges, including inadequate funding, infrastructural deficits, limited access to digital technologies, and persistent brain drain. Despite hosting a large and expanding university system, Nigeria's contribution to global scholarly output remains relatively low, accounting for less than 1% of global research production. According to the UNESCO Institute for Statistics (2022), Africa contributes less than 3% of global research output, highlighting a significant gap in knowledge production and dissemination. These constraints underscore the urgent need for innovative approaches to academic staff development, particularly through the integration of AI-driven training systems that can bridge capacity gaps and enhance productivity. Nigeria possesses one of the largest higher education systems in Africa, with approximately 200 universities and over 60,000 academic staff. While there has been growth in publication output over the years, citation impact, research quality, and international collaboration rates remain below global benchmarks. Recognizing these challenges, the Federal Government of Nigeria has introduced intervention mechanisms such as the Tertiary Education Trust Fund (TETFund) and the National Research Fund to support academic staff development through conference sponsorships, postgraduate training, research grants, and capacity-building initiatives. However, these interventions have largely relied on conventional training models, with limited integration of emerging technologies such as AI.

At the institutional level, Ahmadu Bello University, Zaria, stands as one of Nigeria's premier universities, with a long-standing commitment to academic excellence and staff development. The university has benefited from

federal interventions, implementing in-service training, research workshops, international collaborations, and sabbatical programs aimed at enhancing academic staff performance. Despite these efforts, challenges related to research visibility, teaching innovation, and digital transformation persist, indicating the need for more technologically driven training approaches. Against this backdrop, the integration of Artificial Intelligence into academic staff training and development presents a strategic pathway for improving teaching effectiveness, increasing research productivity, and strengthening institutional competitiveness. More importantly, it aligns with national development objectives by fostering innovation, enhancing human capital, and positioning Nigeria within the global knowledge economy. This study therefore examines how AI-based training can enhance academic staff performance in Ahmadu Bello University and explores its broader implications for national development.

1.2 Statement of Problem

In a well-functioning higher education system, training and development initiatives particularly those enhanced by modern technologies are expected to produce measurable improvements in academic staff performance. With the growing integration of Artificial Intelligence (AI) in education, training is no longer limited to conventional workshops and conference participation but now includes AI-driven tools such as adaptive learning platforms, automated research assistants, digital pedagogy systems, and data analytics for performance monitoring. Ideally, these AI-based training approaches should strengthen teaching effectiveness through innovative instructional delivery, enhance research productivity via intelligent data analysis and collaboration tools, and ultimately improve institutional competitiveness and contributions to national development.

However, despite substantial investments in academic staff development in Nigeria, there remains a persistent concern regarding the extent to which these efforts--particularly in the context of emerging AI technologies--translate into improved performance outcomes. Nigerian universities continue to rank relatively low in global university rankings, especially in areas such as research influence, citation impact, and teaching quality, as highlighted by Times Higher Education (2022). Furthermore, student feedback across many public universities frequently points to the continued use of traditional teaching methods, limited integration of digital tools, and low levels of interactive learning. Although research output has increased in quantity, it often lacks visibility in high-impact, globally indexed journals, thereby limiting its contribution to global knowledge systems. At the institutional level, Ahmadu Bello University, Zaria, has implemented several academic staff development initiatives supported by national intervention agencies such as the Tertiary Education Trust Fund (TETFund) and the National Research Fund. These initiatives include conference sponsorship, postgraduate training, research grants, sabbatical programs, and capacity-building workshops. While these efforts have contributed to increased participation in academic activities, it remains unclear whether they have led to sustained improvements in teaching effectiveness and research productivity, particularly in an era where AI-driven competencies are becoming essential. Empirical observations suggest a disconnect between resource allocation and actual performance outcomes, raising concerns about the efficiency and relevance of existing training models.

Several factors contribute to this persistent performance gap. First, many training programs are not guided by systematic needs assessments, resulting in a mismatch between training content and the specific digital and AI-related competencies required by academic staff. Second, weak monitoring and evaluation mechanisms limit the ability to assess the impact of both conventional and AI-based training interventions on measurable performance indicators. Third, disparities in access to training opportunities across faculties hinder uniform capacity development, especially in the adoption of AI tools for teaching and research. Fourth, structural constraints such as heavy teaching workloads and administrative responsibilities reduce the time available for staff to engage with emerging AI technologies and apply acquired skills effectively. More critically, while global institutions are increasingly leveraging AI to enhance academic performance, Nigerian universities including

Ahmadu Bello University have yet to fully integrate AI into their staff development frameworks.

Existing studies largely focus on the general relationship between training and performance without explicitly examining the role of AI-based training in improving academic outcomes. Additionally, many studies fail to disaggregate training components into specific, measurable indicators such as AI-enhanced teaching effectiveness, digital research productivity, and innovation outputs. This gap highlights the need for a focused empirical investigation into how Artificial Intelligence-based training influences academic staff performance within a specific institutional context. Therefore, this study seeks to examine the extent to which AI-driven training and development initiatives can enhance teaching effectiveness and research productivity at Ahmadu Bello University, Zaria, and to explore the broader implications of such improvements for national development. By addressing this problem, the study provides evidence-based insights for policymakers, university administrators, and funding agencies aiming to optimize academic staff development in the digital age.

1.3 Objectives of the Study

The main objective of this study is to examine how Artificial Intelligence-based training enhances academic staff performance in Ahmadu Bello University, Zaria, and its implications for national development. The specific objectives are to:

Examine the effect of AI-based training programs on the performance of academic staff in Ahmadu Bello University.

Evaluate the impact of AI-driven research tools and digital publication platforms on research productivity and scholarly output.

1.4 Research Questions

How does Artificial Intelligence-based training influence the performance of academic staff in Ahmadu Bello University, Zaria?

To what extent does the use of AI-driven research tools and digital publication systems affect research productivity of academic staff in the study area?

Research Hypotheses

To guide the study, the following null hypotheses are formulated:

H0? : Artificial Intelligence-based training has no significant effect on the performance of academic staff in Ahmadu Bello University, Zaria.

H0? : The use of AI-driven research tools and digital publication systems has no significant effect on research productivity of academic staff in the study area.

Literature Review

The Concept of Enhancing Academic Staff Performance and Artificial Intelligence-Based Training

Enhancing academic staff performance has become a central concern in contemporary higher education due to its direct implications for educational quality, institutional effectiveness, and national development. Academic staff constitutes the intellectual engine of universities, and their performance determines the extent to which institutions fulfill their core mandates of teaching, research, and community service. Traditionally, academic staff performance is conceptualized as a multidimensional construct encompassing teaching effectiveness, research

productivity, and service delivery (Ekundayo & Ajayi, 2019; Salami, 2020). Teaching effectiveness involves the ability of lecturers to design and deliver curriculum content in a manner that promotes student understanding, engagement, and critical thinking, while research productivity refers to the generation of new knowledge through publications, conference presentations, patents, and other scholarly outputs. Service delivery includes administrative responsibilities, mentorship, and contributions to institutional governance. Enhancing academic staff performance, therefore, refers to deliberate and systematic efforts aimed at improving these dimensions through capacity building, professional development, motivation, and the provision of enabling environments. Such enhancement is typically achieved through training and development programmes, research funding, mentorship schemes, and exposure to global best practices. According to National Universities Commission, continuous professional development is essential for maintaining academic standards and ensuring that lecturers remain relevant in a rapidly changing knowledge environment. In advanced educational systems, performance enhancement is closely tied to innovation, digital competence, and the ability to adapt to emerging technologies, particularly in the era of the Fourth Industrial Revolution. In recent years, the concept of academic staff performance has evolved beyond traditional metrics to incorporate digital literacy, technological adaptability, interdisciplinary collaboration, and global research visibility. This shift is largely driven by the increasing integration of digital technologies into teaching and research processes. Universities are now expected to produce graduates equipped with 21st-century skills, including critical thinking, problem-solving, and digital competence, which in turn requires academic staff to continuously upgrade their skills.

Enhancing academic staff performance is no longer limited to conventional training methods but increasingly involves technologically driven approaches that improve efficiency, innovation, and productivity. One of the most transformative developments in this regard is the emergence of Artificial Intelligence (AI) in education. Artificial Intelligence refers to the simulation of human intelligence processes by machines, particularly computer systems, enabling them to perform tasks such as learning, reasoning, problem-solving, and decision-making. According to the UNESCO (2021), AI in education involves the use of intelligent systems to facilitate teaching, learning, assessment, and educational management. AI technologies such as machine learning, natural language processing, predictive analytics, and intelligent tutoring systems are increasingly being integrated into higher education systems to enhance both teaching and research activities. Artificial Intelligence-based training refers to the use of these intelligent technologies to design, deliver, and evaluate training programmes for academic staff. Unlike traditional training approaches, which are often generalized and periodic, AI-based training is personalized, adaptive, and continuous. It leverages data analytics to identify individual skill gaps, recommend tailored learning pathways, and provide real-time feedback. For instance, adaptive learning platforms can customize training content based on the user's pace and level of understanding, while AI-powered analytics tools can track performance metrics and predict future training needs. This makes AI-based training more efficient and outcome-oriented compared to conventional methods.

Furthermore, AI-based training enhances research productivity by providing tools that support literature review, data analysis, plagiarism detection, and academic writing. Tools such as AIdriven research assistants and citation management systems enable academic staff to process large volumes of information quickly and produce high-quality scholarly outputs. In teaching, AI facilitates the use of smart classrooms, automated grading systems, virtual learning environments, and student performance analytics, thereby improving instructional delivery and student engagement. These innovations contribute significantly to improving both teaching effectiveness and research productivity, which are the core indicators of academic staff performance. In the context of developing countries such as Nigeria, the adoption of AI-based training presents both opportunities and challenges. On one hand, it offers a strategic solution to existing limitations in traditional training systems by providing scalable, cost-effective, and flexible learning opportunities. On the other hand, issues such as

inadequate digital infrastructure, limited funding, low digital literacy among academic staff, and resistance to technological change pose significant barriers to effective implementation. Despite these challenges, institutions such as Ahmadu Bello University have begun to explore digital learning platforms and technology-driven training initiatives, although the integration of AI remains at an emerging stage.

Importantly, enhancing academic staff performance through AI-based training has far-reaching implications for national development. Universities play a critical role in producing skilled manpower, generating knowledge, and driving innovation, all of which are essential for economic growth and societal advancement. By improving the capacity of academic staff, AI-based training contributes to the development of a knowledge-based economy, enhances global competitiveness, and supports sustainable development goals. As noted by UNESCO Institute for Statistics (2022), countries that invest in research and innovation tend to experience higher levels of economic development and technological advancement. The literature reviewed revealed that enhancing academic staff performance is a dynamic and multifaceted process that requires continuous adaptation to emerging global trends and technological advancements. Artificial Intelligencebased training represents a paradigm shift in academic staff development, offering innovative solutions to longstanding challenges in higher education. By integrating AI into training frameworks, universities can significantly improve teaching effectiveness, research productivity, and overall institutional performance, thereby contributing meaningfully to national development.

The Concept of National Development and the Implications of Enhancing Academic Staff Performance through Artificial Intelligence-Based Training

The concept of national development occupies a central position in the discourse of economics, public administration, and development studies, as it reflects the overall progress and advancement of a nation in terms of economic growth, social well-being, political stability, and technological innovation. National development is not limited to increases in gross domestic product (GDP) but encompasses broader improvements in living standards, human capital development, institutional capacity, and equitable distribution of resources. Scholars such as Todaro and Smith (2015) conceptualize national development as a multidimensional process involving structural transformation, reduction in poverty and inequality, and enhancement of human capabilities. In this regard, education is widely recognized as a critical driver of national development, as it equips individuals with the knowledge, skills, and competencies required to contribute meaningfully to economic and social progress. Higher education institutions, particularly universities, play a pivotal role in advancing national development through the production of skilled manpower, generation of knowledge, and promotion of innovation. Academic staff, as the core drivers of these functions, significantly influence the quality of graduates, the relevance of research outputs, and the capacity of institutions to respond to societal challenges. Consequently, enhancing academic staff performance is intrinsically linked to national development outcomes. When academic staff are effective in teaching, students acquire relevant skills that improve employability and productivity. Similarly, when academic staff engages in high-quality research, they contribute to technological advancement, policy formulation, and evidence-based decision-making.

In the contemporary global knowledge economy, the relationship between education and national development has been further strengthened by the emergence of digital technologies, particularly Artificial Intelligence (AI). AI is transforming the way knowledge is created, disseminated, and applied across various sectors, including education, healthcare, agriculture, and governance. According to the UNESCO (2021), the integration of AI into education systems has the potential to accelerate progress toward sustainable development by enhancing learning outcomes, improving access to quality education, and fostering innovation. AI-driven systems enable data-informed decision-making, personalized learning experiences, and efficient resource management, all of which contribute to improved educational outcomes and, by extension, national development.

Enhancing academic staff performance through Artificial Intelligence-based training represents a strategic approach to strengthening the capacity of universities to fulfill their developmental roles. AI-based training refers to the use of intelligent technologies such as machine learning, natural language processing, and predictive analytics to design, deliver, and evaluate training programs tailored to the specific needs of academic staff. These technologies enable personalized and continuous professional development, allowing academic staff to acquire relevant digital competencies, improve pedagogical practices, and enhance research productivity. Unlike traditional training methods, AI-based training provides real-time feedback, adaptive learning pathways, and data-driven insights, making it more effective in addressing individual performance gaps.

The implications of AI-based training for national development are significant and far-reaching. First, it enhances the quality of teaching and learning by equipping academic staff with innovative instructional tools such as intelligent tutoring systems, virtual learning environments, and automated assessment platforms. This leads to improved student learning outcomes, higher graduation rates, and the development of a skilled workforce capable of driving economic growth. Second, AI-based training improves research productivity by providing advanced tools for data analysis, literature review, and academic writing, thereby increasing the quantity and quality of scholarly outputs. High-quality research contributes to innovation, technological advancement, and evidence-based policymaking, which are essential components of national development. Furthermore, AI-based training promotes institutional efficiency and global competitiveness by enabling universities to align with international best practices and ranking criteria. Universities that adopt AI technologies are better positioned to improve their research visibility, attract international collaborations, and secure funding opportunities. This enhances their contribution to national development by positioning the country within the global knowledge economy. In the Nigerian context, institutions such as Ahmadu Bello University play a critical role in this process, given their capacity to influence both educational outcomes and research outputs at a national scale.

However, the effective utilization of AI-based training in enhancing academic staff performance and promoting national development is contingent upon several enabling factors. These include adequate digital infrastructure, investment in technology, supportive institutional policies, and the development of digital literacy among academic staff. In Nigeria, intervention agencies such as the Tertiary Education Trust Fund (TETFund) have made significant contributions to improving higher education through funding for research, infrastructure, and capacity building. Nevertheless, there remains a need to integrate AI-focused training initiatives into these programs to maximize their impact on academic performance and national development. Despite its potential benefits, the adoption of AI in academic staff training also presents challenges, including ethical concerns, data privacy issues, resistance to technological change, and the risk of widening the digital divide between institutions with varying levels of resources. Addressing these challenges requires a coordinated effort among government agencies, university management, and other stakeholders to develop policies that promote equitable access to AI technologies and ensure their responsible use. The literature revealed that, national development is a comprehensive and multidimensional process that is closely linked to the quality of education and the performance of academic staff in higher institutions. Enhancing academic staff performance through Artificial Intelligence-based training offers a transformative pathway for improving educational outcomes, advancing research productivity, and strengthening institutional capacity. By leveraging AI technologies, universities can better fulfill their roles as drivers of innovation and development, thereby contributing significantly to national growth and global competitiveness. Therefore, the integration of AI into academic staff development is not only an educational imperative but also a strategic necessity for achieving sustainable national development.

Empirical Review

Empirical studies on training and development in higher education consistently demonstrate a strong relationship between capacity-building initiatives and academic staff performance, particularly in areas of teaching effectiveness, research productivity, and overall institutional output. One notable empirical study by Bello et al. (2024) examined the effect of interventionbased training programmes on staff development at a Nigerian university, focusing specifically on conference attendance and postgraduate sponsorship under the Tertiary Education Trust Fund (TETFund). The study adopted a survey research design, utilizing structured questionnaires administered to academic staff, while data were analyzed using multiple regression techniques. The findings revealed that conference attendance sponsorship and academic scholarships had a positive and statistically significant effect on staff development, although the magnitude of the effect was relatively modest. This suggests that while training interventions contribute to performance improvement, their impact may be constrained by systemic factors such as bureaucratic delays, inadequate funding access, and limited follow-up mechanisms. The study is particularly relevant because it highlights the importance of structured professional development in enhancing academic competencies through exposure to global knowledge networks, peer collaboration, and scholarly engagement. Conference participation was found to improve research capabilities by facilitating knowledge exchange and networking opportunities, which are critical for increasing publication output and academic visibility. However, the study also identified institutional inefficiencies that limit the full realization of these benefits, thereby suggesting that traditional training approaches may not be sufficient in addressing modern academic performance challenges. This limitation underscores the need for more innovative and technology-driven training models, such as Artificial Intelligence-based systems, which can provide continuous, personalized, and data-driven learning experiences for academic staff.

Similarly, Bappi, Bello, and Jamari (2024) conducted an empirical assessment of the impact of training and development programmes on academic staff performance at Gombe State University. The study employed a descriptive survey design, with a sample size of 238 academic staff selected through proportionate and random sampling techniques. Data were collected using selfadministered questionnaires and analyzed using descriptive statistics and Pearson correlation analysis. The findings indicated a strong positive correlation between training components such as academic study fellowships, conference attendance, and workshop participation and academic staff performance. Specifically, the study established that conference attendance and workshop participation significantly improved teaching effectiveness and research productivity, while academic fellowships enhanced advanced knowledge acquisition and specialization. This study provides empirical support for the argument that training and development are critical drivers of academic staff performance, particularly in developing countries where institutional capacity constraints are prevalent. However, similar to the previous study, it also revealed challenges related to limited access to training opportunities and the absence of clear policy frameworks guiding staff development programmes. These challenges often result in unequal distribution of training benefits among academic staff and reduce the overall effectiveness of such initiatives.

A critical synthesis of these empirical studies reveals two important insights. First, traditional training methods such as conference attendance, workshops, and postgraduate sponsorship have a significant but limited impact on academic staff performance, largely due to structural and institutional constraints. Second, there is a noticeable gap in the integration of emerging technologies, particularly Artificial Intelligence, into staff development frameworks. While both studies emphasize the importance of training in enhancing performance, they do not account for the transformative potential of AI-driven training systems, which can address many of the identified limitations by offering personalized learning pathways, real-time performance monitoring, and scalable training solutions. Therefore, the existing empirical literature provides a strong foundation for understanding the relationship between training and academic staff performance but also exposes a critical gap in terms of technological innovation. This gap justifies the need for further empirical investigation into how Artificial

Intelligence-based training can enhance academic staff performance more effectively and contribute to broader national development outcomes.

1.7 Research Methodology

This study adopts a descriptive survey research design to examine how Artificial Intelligencebased training enhances academic staff performance and its implications for national development. The population comprises all academic staff within the Faculty of Administration at Ahmadu Bello University, including departments such as Public Administration and Local Government Studies. As of the 2024 academic session, the faculty has an estimated population of 96 academic staff, ranging from Graduate Assistants to Professors. A sample size of 77 respondents was determined using Yamane's (1967) formula, ensuring adequate representation. Primary data were collected through a combination of structured questionnaires and interviews, administered both physically and electronically. The instruments were designed to capture variables related to AI-based training exposure, including the use of digital learning platforms, AI-driven research tools, and technology-enhanced teaching methods, as well as indicators of academic staff performance such as teaching effectiveness and research productivity. Data analysis was conducted using both descriptive and inferential statistics with the aid of SPSS (Version 25). Descriptive statistics, including frequencies and percentages, were used to summarize demographic characteristics and responses to research questions. Inferential analysis was performed using multiple regression techniques to examine the effect of AI-based training variables (such as AI-supported teaching tools, digital research systems, and intelligent learning platforms) on academic staff performance indicators. Hypotheses were tested at a 5% level of significance ($p < 0.05$), providing a basis for determining the statistical relationship between Artificial Intelligence-based training and academic staff performance in Ahmadu Bello University.

1.8 Data Presentation, Analysis and Interpretation

This section presents the analysis of data collected from academic staff of Ahmadu Bello University. The analysis is structured into demographic characteristics, research questions, and hypotheses testing. Data are presented using tables, percentages, and regression analysis to examine the influence of Artificial Intelligence (AI)-based training on academic staff performance and its implications for national development.

Demographic Characteristics of Respondents

Table 1: Demographic Distribution of Respondents (n = 77)

Source: Field Survey, 2026

The table shows a balanced distribution of respondents across ranks and experience levels, indicating that the data reflects diverse academic perspectives. The dominance of mid-career and senior staff suggests reliable insights into AI training and performance.

Analysis of Research Questions

Research Question 1: How does AI-based training influence academic staff performance? Table 2: AI-Based Training and Performance

Source: Field Survey, 2026

Majority of respondents agreed that AI-based training significantly improves teaching effectiveness, digital competence, and assessment methods, indicating a positive influence on academic performance.

Research Question 2: To what extent do AI tools affect research productivity? Table 3: AI Tools and Research Productivity

Source: Field Survey, 2026

Findings reveal that AI-driven tools significantly enhance research productivity through improved data analysis, writing support, and access to academic resources.

Test of Hypotheses

Regression Analysis (Combined Table) Table 4.4: Regression Results

Source: Field Survey, 2026

The model summary shows that 61.1% (R? = 0.611) of variation in academic staff performance is explained by AI-based training and AI research tools. This indicates a strong explanatory power. The ANOVA result ($F = 45.321$, $p < 0.05$) confirms that the overall regression model is statistically significant. The coefficients indicate that AI-based training ($a = 0.542$, $p < 0.05$) has a strong positive and significant effect on performance as such H0? is rejected. It also revealed that AI research tools ($a = 0.438$, $p < 0.05$) also significantly improve research productivity thus, H0? is rejected -> AI research tools significantly affect research productivity. The findings clearly demonstrate that AI-based training plays a critical role in enhancing both teaching effectiveness and research productivity among academic staff in Ahmadu Bello University. The strong statistical significance suggests that integrating AI into staff development programs can substantially improve institutional performance and contribute to national development through better human capital formation and knowledge production.

1.9 Discussion of Findings

The findings of this study provide strong empirical evidence that Artificial Intelligence (AI)based training significantly enhances academic staff performance in Ahmadu Bello University, particularly in the areas of teaching effectiveness and research productivity. The regression results revealed that AI-based training and AI-driven research tools jointly explain a substantial proportion of variation in academic staff performance, indicating that technologydriven capacity building is not only relevant but essential in modern higher education systems. The results from Research Question One showed that AI-based training improves teaching delivery, assessment practices, and digital competence among academic staff. This finding aligns with global trends in higher education, where AI technologies such as adaptive learning systems, automated grading tools, and intelligent tutoring platforms are increasingly used to enhance instructional quality. The implication is that academic staff who are exposed to AI-based training are better equipped to adopt innovative pedagogical approaches, foster student engagement, and deliver learning outcomes that meet international standards. This supports the argument that digital competence is now a critical component of academic performance, extending beyond traditional teaching methods. Similarly, findings from Research Question Two indicated that AI-driven research tools significantly improve research productivity. Respondents acknowledged that AI tools enhance data analysis, academic writing, and access to scholarly resources, thereby increasing publication output and research quality. This finding is consistent with emerging literature that highlights the role of AI in accelerating research processes through automation, predictive analytics, and efficient information retrieval.

The implication is that AI not only increases the quantity of research output but also improves its quality and global visibility, which are key indicators used by ranking bodies such as Times Higher Education. The hypothesis testing further reinforced these findings, as both null hypotheses were rejected. AI-based training was found to have a statistically significant effect on academic staff performance, while AI-driven research tools significantly influenced research productivity. These results suggest that the integration of AI into academic staff development frameworks can bridge the gap between training investments and performance outcomes, a challenge that has persisted in Nigerian universities despite interventions by agencies such as the Tertiary Education Trust Fund. Importantly, the findings highlight a shift from conventional training models such as conference attendance and workshops to continuous, personalized, and data-driven learning systems enabled by AI. Unlike traditional methods, AI-based training provides real-time feedback, identifies individual skill gaps, and offers tailored learning pathways, thereby improving the efficiency and effectiveness of capacity-building efforts. This transformation is particularly relevant in addressing challenges such as uneven access to training opportunities, lack of follow-up mechanisms, and limited monitoring and evaluation frameworks. From a national development perspective, the findings underscore the strategic importance of enhancing academic staff performance through AI-based training. Improved teaching effectiveness leads to better-quality graduates with relevant skills for the labor market, while enhanced research productivity contributes to innovation, policy development, and economic growth. Thus, the integration of AI into academic training is not merely an institutional concern but a national imperative for building a knowledge-based economy.

1.10 Conclusion

Based on the findings, the study concludes that Artificial Intelligence-based training represents a transformative approach to academic staff development in higher education. The integration of AI into training frameworks enhances teaching effectiveness and research productivity, thereby improving overall academic performance. The study further concludes that traditional training methods alone are insufficient to meet the demands of the modern knowledge economy. Instead, there is a need for a paradigm shift toward technology-driven training systems that are adaptive, data-driven, and continuous. AI-based training not only addresses existing gaps in conventional capacity-building programs but also positions universities to compete globally. In the context of national development, the study concludes that improving academic staff performance through AIbased training contributes significantly to human capital development, innovation, and economic growth. Universities that effectively integrate AI into their operations are better positioned to produce skilled graduates, generate impactful research, and contribute to sustainable development.

1.11 Recommendations

Based on the findings and conclusions, the following recommendations are made:

Universities, particularly Ahmadu Bello University, should institutionalize AI-based training programs that focus on digital pedagogy, AI tools for research, and data-driven teaching methods. Also, Government agencies such as the Tertiary Education Trust Fund should expand funding to include AI-focused capacity-building initiatives, including digital infrastructure and AI training platforms. Similarly, efforts should be

made to ensure that all academic staff, regardless of faculty or rank, have equal access to AI-based training programs to avoid disparities in performance.

Academic staff should be encouraged to engage in continuous AI-driven learning through online platforms, workshops, and certification programs to enhance their digital competence. Also, universities should invest in modern ICT infrastructure, including high-speed internet, smart classrooms, and access to AI-powered research

tools, to support effective implementation of AI-based training.

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